NASA SP-7011 (24)

AEROSPACE MEDICINE AND BIOLOGY

A CONTINUING BIBLIOGRAPHY

WITH INDEXES

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

This bibliography was prepared by the NASA Scientific and Technical Information Facility operated for the National Aeronautics and Space Administration by Documentation Incorporated.

NASA SP-7011 (24)

AEROSPACE MEDICINE AND BIOLOGY

A CONTINUING BIBLIOGRAPHY WITH INDEXES

A selection of annotated references to unclassified reports and journal articles that were introduced into the NASA Information System during April, 1966

Scientific and Technical Information Division
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
WASHINGTON, D.C. MAY 1966

This document is available from the Clearinghouse for Federal Scientific and Technical Information (CFSTI), Springfield, Virginia, 22151, for $1.00.

INTRODUCTION

Aerospace Medicine and Biology is a continuing bibliography which, by means of periodic supplements, serves as a current abstracting and announcement medium for references on this subject. The publication is compiled through the cooperative efforts of the Aerospace Medicine and Biology Bibliography Project of the Library of Congress (LC), the American Institute of Aeronautics and Astronautics (AIAA), and NASA. It assembles, within the covers of a single bibliographic announcement, groups of references that were formerly announced in separate journals, and provides a convenient compilation for medical and biological scientists. Additional background details for this publication can be found in the first issue, NASA SP-7011, which was published in July, 1964. Supplements are identified by the same number followed by two additional digits in parentheses.

In its subject coverage, *Aerospace Medicine and Biology* concentrates on the biological, physiological, psychological, and environmental effects to which man is subjected during and following simulated or actual flight in the earth's atmosphere or in interplanetary space. References describing similar effects on biological organisms of lower order are also included. Such related topics as sanitary problems, pharmacology, toxicology, safety and survival, life support systems, exobiology, and personnel factors receive appropriate attention. In general, emphasis will be placed on applied research, but references to fundamental studies and theoretical principles related to experimental development also qualify for inclusion. The contents of this issue are comprised of abstracts that were prepared by the three contributing organizations.

Each entry consists of a standard citation accompanied by its abstract. It is included in one of three groups of references that appear in the following order:

a. NASA entries identified by their *STAR* accession numbers (N66-10000 series),
b. AIAA entries identified by their *IAA* accession numbers (A66-10000 series); and
c. LC entries identified by a number in the A66-80000 series.

Many of the abstracts included in this publication have been reproduced from those appearing in *STAR* and *IAA*. This procedure, adopted in the interests of economy and speed, has introduced some variation in size, style, and intensity of type.

AVAILABILITY OF DOCUMENTS

STAR Entries

NASA documents listed are available without charge to:

1. NASA Offices, Centers, contractors, subcontractors, grantees, and consultants.
2. Other U. S. Government agencies and their contractors.
3. Libraries that maintain depositories of NASA documents for public reference.
4. Other organizations having a need for NASA documents in work related to the aerospace program.
5. Foreign organizations that exchange publications with NASA or that maintain depositories of NASA documents for public use.

Non-NASA documents listed are provided by NASA without charge only to NASA Offices, Centers, contractors, subcontractors, grantees, and consultants.

Organizations and individuals not falling into one of these categories may purchase the documents listed from either of two sales agencies, as specifically identified in the abstract section:

Clearinghouse for Federal Scientific
and Technical Information (CFSTI),
Port Royal Road, Springfield, Virginia, 22151

Superintendent of Documents (GPO)
U.S. Government Printing Office
Washington, D.C. 20402

Information on the availability of this publication and other reports covering NASA scientific and technical information may be obtained by writing to:

Scientific and Technical Information Division
National Aeronautics and Space Administration
Code USS-AD
Washington, D.C. 20546

Collections of NASA documents are currently on file in the organizations listed on the inside of the back cover.

(continued)

IAA Entries

All articles listed are available from the American Institute of Aeronautics and Astronautics, Technical Information Service. Individual and Corporate AIAA Members in the United States and Canada may borrow publications without charge. Interlibrary loan privileges are extended to the libraries of government agencies and of academic nonprofit institutions in the United States and Canada. Loan requests may be made by mail, telephone, telegram, or in person. Additional information about lending, photocopying, and reference service will be furnished on request. Address all inquiries to:

Technical Information Service
American Institute of Aeronautics and Astronautics, Inc.
750 Third Avenue, New York 17, New York

For further details please consult the *Introductions* to *STAR* and *IAA*, respectively.

LC Entries

Articles listed are available in the journals in which they appeared. They may be borrowed or consulted in libraries maintaining sets of these journals. In some instances, reprints may be available from the journal offices.

AVAILABILITY OF THIS BIBLIOGRAPHY

Copies of *Aerospace Medicine and Biology* (SP-7011) and its supplements can be obtained from NASA (Code USS-A), without charge, by NASA offices and contractors, U.S. Government agencies and their contractors, and organizations that are working in direct support of NASA programs.

Other organizations can purchase copies of the bibliography from the Clearinghouse for Federal Scientific and Technical Information, Springfield, Virginia 22151.

TABLE OF CONTENTS

	Page
STAR Entries (N66-10000)	1
IAA Entries (A66-10000)	41
LC Entries (A66-80000)	47
Subject Index	I-1
Corporate Source Index	I-51
Personal Author Index	I-59

NASA

AEROSPACE MEDICINE AND BIOLOGY

a continuing bibliography MAY 1966

STAR ENTRIES

N66-16192*# Naval School of Aviation Medicine, Pensacola, Fla.
THOUSAND AVIATOR STUDY: METHODOLOGY
Albert Oberman, Robert E. Mitchell, and Ashton Graybiel 22 Jul. 1965 178 p refs *Its* Monograph 11
(NASA Order R-136)
(NASA-CR-69895) CFSTI: HC $5.00/MF $1.00 CSCL 05I

The Pensacola study of Naval Aviators, commonly termed the "Thousand Aviator Study," began in July 1940 as a survey to validate techniques for pre-selecting pilot trainees in order to reduce the large attrition rate in the flight training program at that time. From this original exploratory study of pilot selection evolved a longitudinal study which has provided continuous physiologic information on a group of healthy males from youth to senescence. Re-examinations have been made on survivors of the group in 1951, 1957, and 1963. This Monograph purports to accomplish the following aims: (1) Present and unify the procedures and methods of all the examinations carried out on the group; (2) offer standard material for cooperative studies; (3) serve as a guide for future evaluation; (4) display the methodology employed in a fashion which lends itself to perusal by critical reviewers; (5) suggest by retrospection necessary modification; and (6) provide a basis for scrutinizing the material in search of new avenues of investigation. The material falls into the natural division of the four different examinations carried out to date, each chapter containing data regarding procedures and tests of a particular study. No findings of any of the evaluations are presented; for these the reader is referred to the Thousand Aviator Study Bibliography. Author

N66-16214# Naval Research Lab., Washington, D. C. Chemistry Div.
THE EFFECT OF LIGHT INTENSITY AND THICKNESS OF CULTURE SOLUTION ON OXYGEN PRODUCTION BY ALGAE Interim Report
R. L. Shuler and W. A. Affens 15 Oct. 1965 24 p refs
(NRL-6331; AD-624532) CFSTI: HC $1.00/MF $0.50

Data from a small cylindrical culture unit with variable annular culture chambers indicate that: (a) the rate of oxygen evolution by an algal culture in the linear phase of growth is a logarithmic function of light intensity, and (b) the rate of oxygen evolution per unit volume of suspension is linearly related to the reciprocal of culture thickness. These two relationships have been combined in an empirical equation, which gives the expected variation of the oxygen production rate with light intensity, culture thickness, and suspension volume. The applicability of this equation has been tested on a larger, multi-light culture unit in this laboratory. The agreement between the experimental and calculated oxygen production rates was very satisfactory, suggesting that the equation is not limited to a particular culture unit but may have wide applicability. The efficiency of the culture unit but may have wide applicability. The efficiency of the culture unit from the viewpoint of electrical power utilization has been calculated, and it was found that the maximum conversion of electrical energy to chemical energy based on oxygen evolution was only 0.51 percent. The maximum efficiency in converting light energy to chemical energy was approximately 12 percent. An extrapolation of the experimental results suggests that approximately 2 cubic feet and 30 kilowatts would be required to provide for the oxygen needs of one man. Author (TAB)

N66-16222# Commissariat a l'Energie Atomique, Fontenay-aux-Roses (France). Dept. de la Protection Sanitaire.
EVALUATION AS A FUNCTION OF AGE OF THE EFFECTIVE ENERGY ABSORBED IN ANY GRAM (ϵ/m) OF ORGANS OTHER THAN THE GASTRO-INTESTINAL TRACT BY THE PRINCIPAL RADIONUCLIDES WHICH COULD EVENTUALLY CONTAMINATE THE FOOD AND THE ENVIRONMENT [EVALUATION EN FONCTION DE L'AGE DES INDIVIDUS DE L'ENERGIE EFFECTIVE DELIVREE A L'UNITE OF MASSE (ϵ/m) DES ORGANES AUTRES QUE LE TRACTUS GASTRO-INTESTINAL PAR LES PRINCIPAUX RADIONUCLIDES SUSCEPTIBLES DE CONTAMINER LA CHAINE ALIMENTAIRE ET LE MILIEU AMBIANT]
Arlette Garnier Brussels, EURATOM, Oct. 1965 102 p refs in FRENCH; ENGLISH summary
(Contract Euratom-003-61-10PSAF)
(CEA-R-2809; EUR-2425.f) CFSTI: HC $4.00/MF $0.75

In order to evaluate internal radiation doses it is necessary to know the effective energy dissipated in any gram of the organ of reference, which depends, for any radionuclide, on the physical energy (E) absorbed in the body organ, on the relative biological effectiveness (RBE), on the relative damage factor (n) and on the mass of the organ (m). This effective energy may be evaluated as a function of the size and of the mass of the organs, from birth to adult age. This work is done for the principal radionuclides, which could eventually contaminate the food and the environment. Author

N66-16244# Joint Publications Research Service, Washington, D. C.

***VESTNIK* OF THE USSR ACADEMY OF MEDICAL SCIENCES, VOL. XX, NO. 10, 1965**

N. A. Yudayev et al 7 Jan. 1966 158 p refs Transl. into ENGLISH of Vestnik Akad. Med. Nauk SSSR (Moscow), v. 20, no. 10, 1965 p 3-85

(JPRS-33643; TT-66-30087)

CONTENTS:

1. ON THE EFFECT OF CORTICOSTEROIDS AND ACTH ON THE HYPOPHYSIS-ADRENEL CORTICAL SYSTEM N. A. Yudayev p 1-15 refs

2. SOME ASPECTS OF THE BIOSYNTHESIS OF STEROID HORMONES IN THE ADRENAL CORTEX N. A. Yudayev and Yu. A. Pankov p 16-35 refs

3. STEROID HORMONES AND ATHEROSCLEROSIS M. A. Krekhova p 36-55 refs

4. CERTAIN BASIC PROBLEMS IN THE PATHOGENESIS OF DIABETES MELLITUS V. G. Baranov, L. L. Liberman, and I. M. Sokoloverova p 56-75 refs

5. AUTOIMMUNE PROCESSES IN DISEASES OF THE THYROID GLAND A. M. Raskin p 76-94 refs

6. THE EXOPHTHALMIC FACTOR AND ITS ROLE IN THE GENESIS OF OPHTHALMOPATHY RELATED TO DISEASES OF THE THYROID GLAND V. V. Potin p 95-111 refs

7. UNCOUPLING OF OXIDATIVE PHOSPHORYLATION IN MITOCHONDRIA OF THE BRAIN IN THE CASE OF THYROTOXICOSIS AND ITS REVERSIBILITY R. R. Rachev p 112-119 refs

8. ON THE GENESIS OF ELECTROCARDIOGRAPHIC CHANGES WITH THE SUGAR TEST Ye. L. Kilinskiy and F. F. Vysokiy p 120-126 refs

9. THE VALUE OF AUTORADIOGRAPHY IN THE STUDY OF BLOOD CELL KINETICS Ye. B. Vladimirskaya and L. D. Krymskiy p 127-137 refs

10. RESULTS OF A SCIENTIFIC CONFERENCE ON THE PATHOGENESIS, CLINICAL COURSE AND TREATMENT OF DISEASES OF THE PANCREAS N. S. Tayts and V. A. Trangeyzer p 138-142

N66-16258# Joint Publications Research Service, Washington, D. C.

SELF-REGULATION AND MEMORY IN THE BRAIN

K. Ivanov-Muroms'kiy et al 26 Jan. 1966 19 p Transl. into ENGLISH from Nauka i Suspil'stvo (Kiev), no. 12, 1965 p 18-25

(JPRS-33898; TT-66-30341) CFSTI: $1.00

The study of neurocybernetics as a functional unity of the cerebral cortical-subcortical processes is briefly outlined. Cortex and subcortex act in concert not only by means of neural stimulation impulses but also by so-called nonimpulse transmissions which vary and retune the excitability of the nerves. Electric cortex stimulation of the temporal sections of the brain produced memories in the form of visual images and sensible speech. As soon as the current was shut off the memories disappeared but if stimulation was renewed at the very same point the same or similar memories were repeated. It was concluded that perhaps the relative role of the temporal regions in memory mechanisms is "higher" than that of other regions of the brain. G.G.

N66-16275 Joint Publications Research Service, Washington, D. C.

THE EFFECT OF CONCENTRATED WHITE AND MONOCHROMATIC RED, GREEN, AND BLUE SOLAR LIGHT ON PLANT GROWTH, DEVELOPMENT, AND YIELD

S. A. Stanko *In its* Heliotechnol. 3 Jan. 1966 p 37-43 refs (See N66-16266 07-34) CFSTI: $3.00

Investigations were made of the effect of concentrated sunlight on seeds and plants. Various experiments were carried out on such crops as grains, oil bearing plants, legumes, and fruits. These were conducted with and without the infrared portion of the spectrum, and for varying time periods. Conclusions are given and it is generalized that the irradiation of the seeds improves the quality, increases yield, and accelerates ripening of the plants. C.T.C.

N66-16283*# Naval School of Aviation Medicine, Pensacola, Fla.

BIOTELEMETRY OF THE TRIAXIAL BALLISTOCARDIOGRAM AND ELECTROCARDIOGRAM IN A WEIGHTLESS ENVIRONMENT

W. Carroll Hixson and Dietrich E. Beischer 8 Sep. 1964 116 p refs *Its* Monograph No. 10

(NASA Order R-20)

(NASA-CR-69828) CFSTI: HC $4.00/MF $0.75 CSCL 06B

The design and development of a constraint platform with an attached biotelemetry module is described. The instrumentation records the cardiac-originated inertial accelerations of a subject freely floating in the weightless environment realized in a jet aircraft flying a Keplerian trajectory. The physiological measurements are transduced, signal conditioned, and telemetered by the instrumentation. The airborne receiving station used to receive, display, and store the telemetered data is also described. Linear and angular acceleration measurements were performed with the equipment, and the results represent the first recording of a triaxial inertial acceleration ballistocardiogram. Triaxial electrocardiographic data were simultaneously measured and telemetered to permit correlation of the mechanical and electrical events of the cardiac complex. BCG and ECG flight data recordings; photographs of the equipment; and schematic drawings of the equipment circuitry are included. L.S.

N66-16308# Philco Corp., Willow Grove, Pa. Bio-Cybernetics Lab.

MYOPOTENTIAL RESPONSE AND THE FORCE OF MUSCLE CONTRACTION Final Report

F. Ray Finley and R. W. Wirta 1 Nov. 1965 118 p refs (Contract Nonr-4292(00))

(Rept.-2386; AD-623951) CFSTI: HC $4.00/MF $0.75

The report correlates myopotential response to varying degrees of muscular exertion and describes the incidence and extent of variability. The scope of the study included the effect of five different loads on six muscle sites in both elbow and shoulder flexion. The data were rendered into tables and into position-torque charts called isomyols. Author (TAB)

N66-16315# Joint Publications Research Service, Washington, D. C.

A MATHEMATICAL DESCRIPTION OF THE PROCESS OF CONTINUOUS CULTURING OF MICROALGAE

I. I. Gitel'zon, B. G. Kovrov, and N. A. Terskov 21 Jan. 1966 11 p refs Transl. into ENGLISH from Dokl. Akad. Nauk SSSR, v. 165, no. 3, 1965 p 692-695

(JPRS-33831; TT-66-30274) CFSTI: $1.00

A mathematical description of the process of culturing microorganisms is presented. Previous research approaches to a description of the process was by a mathematical characterization of the variation of the rate of growth and reproduction of cells with the external and internal parameters. Together with this, another approach to the description of the process

of continuous culturing is possible in which the object of analysis is the cell population considered as a whole. Such a "population" approach not only facilitates description of continuous culturing but also permits making known a number of new aspects, the subtle qualities of which cannot be comprehended by a "cellular" description of the process. In this report an attempt has been undertaken to show this on the example of a continuous densistatic culture of microalgae. M.R.W.

N66-16324# Joint Publications Research Service, Washington, D. C.
PROBLEMS OF SPACE IMMUNOLOGY
R. Petrov 27 Jan. 1966 9 p Transl. into ENGLISH from Med. Gazetta (Moscow), 19 Nov. 1965 p 3
(JPRS-33922; TT-66-30365) CFSTI: $1.00

A discussion on the immunologic problems of space biology and medicine is presented. Prerequisites for the study of cosmic immunology are examined: probable pathogenic agents; effect of prolonged flight on resistance to infectious agents; and interaction of organisms with unusual antigens. M.R.W.

N66-16325# Joint Publications Research Service, Washington, D. C.
PHYSIOLOGY OF ADAPTATION TO HIGH ELEVATIONS
M. M. Mirrakhimov 25 Jan. 1966 20 p Transl. into ENGLISH from Sov. Zdravookhr. Kirgizii (Frunze), no. 5, Sep./Oct. 1965 p 3–11 Presented at the Symp. on "Physiol. Adaptations to Heat, Cold, High Elevations, and Deserts" of the 10th Congr. of the All-Union Physiol. Soc.
(JPRS-33871; TT-66-30314) CFSTI: $1.00

Physiological characteristics of high elevation inhabitants were studied to investigate the problems of chronic adaptation of man to high elevations. An attempt is made to clarify the state of physiological functions of individuals with prolonged residence at high elevations, such as aborigines, and in persons with different periods of acclimation (months, years). Physiological functions studied were blood circulation, respiration, enzyme activity, basic metabolism, and blood content. The study shows that in persons residing at high elevations some functions reaca a level characteristic of aborgenes in 6–12 months, while in otherr a period of over 3–5 years is required. The author is convinced that complete acclimatization to high elevations is accompanied by establishment of physiological functions at a qualitatively and quantitatively new level. M.R.W.

N66-16362 Saha Inst. of Nuclear Physics, Calcutta (India).
STUDY ON BONES. I: ORIENTATION AND NATURE OF CRYSTALLITES IN NORMAL BONE. II: STUDY OF COLLAGEN IN DISEASED BONE (UNUSUAL DYSPLASIA)
N. N. Saha, S. Das, A. K. Saha, S. P. Ghosal, and J. Nag Chowdhury (Inst. of Child Health, Calcutta) *In* India. Dept. of Atomic Energy Proc. of the Nucl. Phys. and Solid State Phys. Symp., Solid State Phys. [1965] p 251–270 refs (See N66-16326 07-23) CFSTI: HC $7.00/MF $1.75

Inorganic crystallites and their structural relationship with the collagen matrix in both normal and diseased human bones were studied by X-ray diffraction, polarization microscopy, chemical analyses, and electron microscopy. Bones were decalcified and their collagen was removed by extraction. Wide angle X-ray diffraction photographs of transverse and longitudinal sections of normal and diseased tibiae were taken with the X-ray beam both perpendicular and parallel to the surface of the sections. It was found that the hydroxyapatite crystallites in normal bone were oriented around the collagen fibrils with their c-axes making an angle of about 41° with the collagen fiber axis. The direction of the normal to the plane $(10\bar{1}1)$ was the fiber axis. In the diseased bones investigated, both the organic and inorganic constituents were disorganized, the inorganic constituent having a very small particle size of random orientation. Preponderance of the long side chain amino acids affected the collagen matrix and led to a predominance of abnormal collagen. These abnormal collagen chains were the sites for abnormal calcifications. G.G.

N66-16363 Bose Research Inst., Calcutta (India).
PHYSICO-CHEMICAL PROPERTIES OF ALPHA-LACTALBUMIN OF GOAT'S MILK
Shila Chaudhuri and A. Sen *In* India. Dept. of Atomic Energy Proc. of the Nucl. Phys. and Solid State Phys. Symp., Solid State Phys. [1965] p 271–279 refs (See N66-16326 07-23) CFSTI: HC $7.00/MF $1.75

Alpha-lactalbumin was crystallized from goat's milk and analyzed by electrophoresis in the pH range 4 to 6 at 1°C, and by free diffusion in pH 5.4 at 20°C. Sedimentation patterns and solubility tests were also studied. The main physicochemical properties of this protein as observed by tests on: partial specific volume, sedimentation coefficient, diffusion coefficient, molecular weight, frictional ratio, extinction coefficient, and nitrogen content, were found to be closely related to protein constituents of cow's and buffalo's milk. G.G.

N66-16394*# Massachusetts Inst. of Tech., Cambridge. Engineering Projects Lab.
[FUNCTIONAL EXTENSION OF THE HUMAN HANDS] Progress Report, 1 Apr.–30 Sep. 1965
Thomas B. Sheridan and William R. Ferrell 28 Jan. 1966 12 p refs
(Grant NsG-107)
(NASA-CR-69856; SA-9991-4) CFSTI: HC $1.00/MF $0.50 CSCL 05H

Progress in the following studies is reported: (1) Development of a spatially continuous remote touch sensor through reflection of geometric light patterns from the backside of the hand's skin; (2) Force feed back capability of remote manipulators for long transmission distances; (3) Development of a computer program as manipulative task simulator to measure human operator's performance; (4) Modification of a master-slave manipulator to include elementary touch sensors on its manipulating surfaces; and (6) Program developments for optimal control of dynamic processes over a previewed span of input. G.G.

N66-16397# Joint Publications Research Service, Washington, D. C.
STUDIES IN BIOLOGY AND INFORMATION
K. S. Trincher 21 Jan. 1966 29 p Transl. into ENGLISH of ch. 3, 9, 11, and concluding remarks from the book "Biologiya i Informatsia. Elementy Biologicheskoy Termodinamiki" Moscow, "Nauka", 1965 p 43–49, 81–89, 95–99, 100–101
(JPRS-33830; TT-66-30273) CFSTI: $1.00

The physical parameters of energy, time, heat flow, interface, and temperature were evaluated for their logical and operational relationships in living systems. The parameter "time" was found to exist only in the microcosm of moving molecules and was not included in the physical state of a macrosystem. Studies on geometric and dielectric structures of a non-nucleated mammalian erythrocyte established a regular network of water ordered in loops and containing spherical dipole molecules of hemoglobin. It was shown that the simultaneous crystal and liquid structure of intracellular water was conjugated with the continuous metabolic functions of the living cell. G.G.

N66-16428* National Academy of Sciences—National Research Council, Washington, D. C. Space Science Board.
STATUS OF KNOWLEDGE OF WEIGHTLESSNESS 1965
Lawrence E. Lamb *In its* Space Res.: Direc. for the Future, Pt. 3 Feb. 1966 p 191–208 refs (See N66-16426 07-30) CFSTI: HC $6.00/MF $1.75

Available information indicates that the initial physiological changes during manned space flight are related to dehydration. From knowledge of recumbency diuresis and decreases in the hydration level with recumbency, it may be presumed that weightlessness is a contributory factor in dehydration. The occurrence of dehydration in recumbency, and presumably during manned space flight, is an acute self-limiting process that is rapidly reversible when normal ambulatory earth activities are resumed. It can be sharply reversed by short-term application of lower-body negative pressure. Immediate postflight events permit the use of a number of physiological maneuvers that provide protection against decreased orthostatic tolerance and that, in this sense, the operational environment is not analogous to the responses noted from tilt-table or simple standing studies. These maneuvers may offer major protection against post-flight decreased orthostatic tolerance. The g suit or other pressure clothing can be used to provide significant protection against decreased orthostatic tolerance. Preliminary evidence suggests that the acute improvement in hydration brought on by short-term application of lower-body negative pressure abolishes the problem of decreased orthostatic tolerance after bed rest. E.E.B.

N66-16429* National Academy of Sciences—National Research Council, Washington, D. C. Space Science Board.
SOME CHARACTERISTICS OF MAN PERTINENT TO SPACECRAFT DESIGN AND OPERATIONS
Julien M. Christensen and Conrad L. Kraft *In its* Space Res.: Direc. for the Future, Pt. 3 Feb. 1966 p 214–282 refs (See N66-16426 07-30) CFSTI: HC $6.00/MF $1.75

Presented are considerations of the desirability of including man in certain types of space missions and the nature of human engineering design data. Human performance efficiency, human problems in the space environment, extravehicular space operations, lunar and planetary operations, and the selection and training of personnel are discussed. Some of man's potential includes: (1) contribution to systems reliability by serving as a source of redundancy or backup for electromechanical systems and his ability to diagnose and repair other subsystems; (2) ability to handle unexpected or low-probability events and to evaluate and discard incorrect or inadequate hypotheses: (3) ability to interpret complex materials and events; (4) ability to do things that equipment cannot yet do at all or cannot do with sufficient reliability. E.E.B.

N66-16439# Laboratoires du Centre d'Etude de l'Energie Nucleaire, Mol (Belgium).
STUDY OF THE CONSERVATION AND STABILITY OF LABELED MACROMOLECULES [ETUDE DE LA CONSERVATION ET DE LA STABILITE DES MACROMOLECULES MARQUEES]
W. Baeyens, P. Charles, C. Davila, R. Huart, L. Ledoux et al Brussels, EURATOM, 1965 30 p refs In FRENCH; ENGLISH summary
(Contract EURATOM-024-62-3-RISB)
(EUR-2419.f) CFSTI: HC $2.00/MF $0.50

The results, which were presented at the Euratom conference on methods of preparing and storing labelled molecules, relate to: (1) The preparation, properties and storage of nucleic acids labelled by biological synthesis or by tritiation *in vitro*. (2) The study of the properties and storage of ribonuclease and lysozyme at high specific activity. Author

N66-16446*# Naval School of Aviation Medicine, Pensacola, Fla. Naval Aerospace Medical Inst.
PRACTICAL AND THEORETICAL IMPLICATIONS BASED ON LONG-TERM FOLLOW-UP OF MENIERE'S PATIENTS TREATED WITH STREPTOMYCIN SULFATE
Ashton Graybiel, Harold F. Schuknecht, Alfred R. Fregly, Earl F. Miller, II, and Michael E. Mc Leod 25 Oct. 1965 29 p refs Joint Report with NASA
(NASA Order R-93)
(NASA-CR-69862; NAMI-948) CFSTI: HC $2.00/MF $0.50 CSCL 06E

Four patients who had received streptomycin sulfate in the treatment of Ménière's disease were evaluated in terms of the long-range effects of therapy and utilized as experimental subjects. The findings are reported in terms of a lack of return of their symptoms, and the effect of the drug on hearing, the semicircular canals, otolith organs, ataxia, and the Coriolis oculogyral illusion. An attempt was made to interpret the findings in terms of the etiology of idiopathic Ménière's disease, and the suggestion is made that it might represent a disturbance attributable to the secretary cells of the crista. Author

N66-16469# Siena Univ. (Italy). Istituto di Patologia Medica.
BRAIN STEM SYSTEMS AND BEHAVIOR Final Scientific Report
Cesare Bartorelli and Alberto Zanchetti 31 May 1965 59 p refs (Grant AF-EOAR-64-41)
(AFOSR-65-1579; AD-623798) CFSTI: HC $3.00/MF $0.75

The objectives of the research were to compare reflex regulation of waking and emotional behaviors; to identify the pontine centers of deep sleep and their pathways; and to study reflex regulation of circulation during sleep. Author (TAB)

N66-16499# Joint Publications Research Service, Washington, D. C.
STUDIES ON ALGAE IN HUNGARY
Tibor Hortobagyi 4 Feb. 1966 12 p Transl. into ENGLISH from Magyar Tudomany (Budapest), v. 10, no. 11, Nov. 1965 p 718–723
(JPRS-34012; TT-66-30454) CFSTI: $1.00

Various experiments on growing algae, undertaken by several research institutes in Hungary, are reviewed, and the relative merits of each method are compared. The conditions related to the profitable establishment of algae-producing installations are listed. The ability of algae to assimilate and incorporate radioactive elements rapidly and in large amounts is emphasized, and its importance as a potential food material is discussed. The relationship of algae production to the nutritional basis of space research is examined, and it is pointed out that, of all the green microscopic plants, algae correspond best to the requirements. The effect of such experimental findings on agricultural development, and their impact on national economic planning are also assessed. M.G.J.

N66-16503# Naval School of Aviation Medicine, Pensacola, Fla.
THE USE OF SEPARATE PREDICTION FORMULAE BASED ON THE PROCUREMENT SOURCE OF OFFICER FLIGHT STUDENTS Special Report No. 65-6
Chalres W. Hutchins, Jr. Aug. 1965 11 p refs
(AD-623826) CFSTI: HC $1.00/MF $0.50

Separate multiple prediction formulae were computed on each of the six major procurement source subgroups of the entering officer flight students. This procedure for developing prediction formulae was compared with two other conditions: a pseudovariable condition, which treats each procurement source as a separate dichotomous variable, and the

current condition which treats the entire officer group as a whole without taking procurement source into account. Two criteria were used for this comparison, namely, the cross-validation coefficients of each condition, and the discriminatory power of the respective conditions as measured by the percentage of attritions placed in the lowest 10 percent of the respective predictor scores. The separate formula condition was the most valid upon crossvalidation and was also found to have the best discrimination at the low end of the range; however, its superiority in the former case failed to reach statistical significance. Author (TAB)

N66-16506# Kansas State Univ., Manhattan. Dept. of Psychology.
THE EVALUATION OF PERCEPTUAL FRAMES OF REFERENCE Technical Reports 33 Through 36
William Bevan and Harry Helson Nov. 1965 132 p refs (Contract Nonr-3634(01))
(AD-623869) CFSTI: HC $4.00/MF $1.00

CONTENTS:
1. BEHAVIOR IN UNUSUAL ENVIRONMENTS W. Bevans 56 p refs (See N66-16507 07-04)
2. VISION IN THE GANZFELD L. L. Avant 23 p refs (See N66-16508 07-05)
3. CONTEXT AND THE PROPERTIES OF BEHAVIOR W. Bevan 32 p refs (See N66-16509 07-04)
4. CHANGES IN RESPONSE LATENCY FOLLOWING SHIFTS IN THE PITCH OF A SIGNAL W. Bevan, R. A. Bell, and C. Taylor 17 p refs (See N66-16510 07-05)

N66-16507 Kansas State Univ., Manhattan. Dept. of Psychology.
BEHAVIOR IN UNUSUAL ENVIRONMENTS
William Bevan *In its* Evaluation of Perceptual Frames of Reference Nov. 1965 56 p refs Submitted for Publication (See N66-16506 07-04) CFSTI: HC $4.00/MF $1.00
(TR-33)

The concept of environment, as it has been understood by psychologists during the past half century, is examined, and a substantive review of the pertinent literature during the last decade is provided. Environmental properties that have characterized the psychologist's use of the term in theoretical formulations and investigational practice are considered. Empirical relationships that exist between behavior and unusual environments are also discussed. It is pointed out that while environment as a concept has achieved a degree of formal articulation, it lacks systematic versatility; there are few clearly established bridges between its place in psychological theories and in the empirical practices of the psychological investigator. The value of focussing attention on environment as a variable in observational situations, and as a systematic concept is also pointed out. A comprehensive bibliography is included. M.G.J.

N66-16508 Kansas State Univ., Manhattan. Dept. of Psychology.
VISION IN THE GANZFELD
Lloyd L. Avant *In its* Evaluation of Perceptual Frames of Reference Nov. 1965 23 p refs Submitted for Publication (See N66-16506 07-04) CFSTI: HC $4.00/MF $1.00
(TR-34)

A summary of the evidence on exposure to structureless visual fields is presented. The data show the experience of such fields to be characterized by reports of immersion in a sea of light which separates into figure and ground as brightness is increased, chromatic adaptation in colored fields, loss of efficiency in detecting the presence and movement of inhomogeneities introduced into the field, disorientation of the observer, an increased and fluctuating state of accommodation, and the occasional joint occurrence of an apparent cessation of function of the visual mechanism and increased alpha activity in the brain. Author

N66-16509 Kansas State Univ., Manhattan. Dept. of Psychology
CONTEXT AND THE PROPERTIES OF BEHAVIOR
William Bevan *In its* Evaluation of Perceptual Frames of Reference Nov. 1965 32 p refs Submitted for Publication (See N66-16506 07-04)
(TR-35) CFSTI: HC $4.00/MF $1.00

In discussing the concept of context and its significance for understanding behavior, two basic points are made: (1) Behavior reflects the principle of relational determination. (2) In identifying the stimulus determinants of behavior, the significant relationships are between response variables and behaviorally effective properties of stimuli. The designs and results of several studies are outlined, and one psychophysical experiment, two in the field of perception, two on reaction time, three on learning, and one on the recall of generic stimuli are reviewed. The conceptual setting for each is given, and the basic notions of adaptation-level theory and the problem of relevance are summarized. It is pointed out that attention to the context problem has effected experimental design in behavioral science by showing the importance of designs, in which the stimulus inputs under consideration are manipulated within subjects or groups rather than between subjects or groups. The conclusion was reached that the methodological approach is the only way by which such phenomena as anchor effects, contrast effects, interpolated stimulus effects, frequency effects, and schedule of reinforcement effects can be studied meaningfully. M.G.J.

N66-16510 Kansas State Univ., Manhattan. Dept. of Psychology.
CHANGES IN RESPONSE LATENCY FOLLOWING SHIFTS IN THE PITCH OF A SIGNAL
William Bevan, Russell A. Bell, and Curtis Taylor *In its* Evaluation of Perceptual Frames of Reference Nov. 1965 17 p refs Submitted for Publication (See N66-16506 07-04) CFSTI: HC $4.00/MF $1.00
(TR-36)

Relationships between response latency in a simple vigilance task and the temporal pattern of stimuli presented for detection were examined. These experiments were repeated, with a change in a substantiative property of the focal stimulus substituted for change in the temporal pattern presentation. In the first test, the prediction to be verified was that the difference between the mean latency and the latency of the test (ΔRL) would increase, within limits, as the test tone pitch deviated from the subject's adaptation-level (AL) identified as the pitch of the series tones. This appeared to be confirmed for a range of 300 mels above the series AL. In the second study, the constant pitch adaptation series was replaced by a variable pitch. The prediction was the same, with the subject's AL identified as the average in mels of the series pitches. Results show that the range of differences in ΔRL exceeded those of Experiment 1. The final experiment was conducted to identify the nature of the internal standard against which responses were referenced. Results show that the prediction of the mean as the best estimate of the subjective standard is not unequivocally confirmed. M.G.J.

N66-16516# Stanford Univ., Calif. Dept. of Genetics
BIOLOGICAL APPLICATIONS OF MASS SPECTROMETRY Final Report, Mar. 1-Jun. 30, 1965
J. Lederberg 1 Aug. 1965 17 p refs
(Grant AF-AFOSR-886-65)
(AFOSR-65-1632; IRL-1030; AD-624074) CFSTI: HC $1.00/MF $0.50

A review is presented of an investigation on the applications of the mass spectrometer to biological research. The mass spectra of the amino acids is examined as well as the spontaneous cyclization of oligopeptides, the optical activity of amino acids, logarithmic recording of the mass spectral data, computer methods and other techniques of analysis, and the heavy particle bombardment of biochemical materials. Included is an article on the optical resolution of D, L amino acids by gas chromatography and mass spectrometry. The use of mass spectrometry is shown for the radio detection of D and L input reagents, as well as to identify the optically active species. Author (TAB)

N66-16526# Army Research Office, Washington, D. C.
TENTH ANNUAL ARMY HUMAN FACTORS RESEARCH AND DEVELOPMENT CONFERENCE
Walter E. Lotz, Jr. Oct. 1964 490 p refs Conf. held at the Army Aviation Center, Fort Rucker, Ala., 5-8 Oct. 1964
(AD-456363)

CONTENTS:
INTRODUCTION
1. BACKGROUND p 3-6 refs
2. KEYNOTE ADDRESS: THE ARMY'S TACTICAL MOBILITY CONCEPT George B. Pickett, Jr. (Army Combat Devel. Command) p 7-17
3. TEN YEARS OF PROGRESS Philip I. Sperling (Special Operations Res. Office) p 18-31
4. CURRENT ARMY HUMAN FACTORS RESEARCH AND DEVELOPMENT PROGRAM Lynn E. Baker p 32-46
5. CRITERIA FOR WHAT? S. Rains Wallace (Defense Res. and Engr.) p 47-60

COMMUNICATION AND CONTROL
6. INFORMATION EXTRACTION AND ASSIMILATION FROM COMMAND SYSTEM DISPLAYS C. H. Hammer (Army Personnel Res. Office) p 63-71 refs (See N66-16527 07-05)
7. THE VALUE OF A NEW REFERENCE TECHNIQUE FOR IMAGE INTERPRETATION H. Martinek (Army Personnel Res. Office) p 72-87 (See N66-16528 07-05)
8. EXPERIMENTS IN ELECTROCUTANEOUS INFORMATION TRANSFER A. I. Siegel (Applied Psychological Services) p 88-98 refs (See N66-16529 07-05)

RECONNAISSANCE AND SECURITY IN AIR MOBILITY
9. EFFECTS OF TARGET/GROUND PARAMETERS ON TARGET IDENTIFICATION J. A. Whittenburg (Human Sci. Res.) p 101-109 refs (See N66-16530 07-05)
10. CONDUCTING HELICOPTER RECONNAISSANCE EXPERIMENTS WITH AIR CAVALRY ELEMENTS H. N. Hopps, B. M. Kibel, and A. R. Woods (Res. Analysis Corp.) p 110-118 (See N66-16531 07-05)
11. TREE TOP ALTITUDE NAVIGATION ON RECONNAISSANCE MISSIONS—A REPORT OF TESTS E. W. Martin (Tech. Operations Res., Ft. Benning, Ga.) p 119-132 ref (See N66-16532 07-05)
12. AVIATOR PERFORMANCE IN THE LIGHT WEAPONS HELICOPTER DURING NAP-OF-THE-EARTH FLIGHT F. H. Thomas (Army Aviation Human Res. Unit.) p 133-141 refs (See N66-16533 07-05)

HUMAN FACTORS ENGINEERING OF MATERIEL FOR AIR MOBILITY
13. ANTHROPOMETRY OF U.S. ARMY AVIATORS R. M. White (Army Natick Labs.) p 147-153 refs (See N66-16534 07-05)
14. HUMAN VIBRATION RESPONSE F. Pradko (Army Tank-Automotive Command) p 154-168 refs (See N66-16535 07-05)
15. TRAINING ORIENTED HUMAN FACTORS ENGINEERING OF ARMY AIRCRAFT R. H. Wright (Army Aviation Human Res. Unit.) p 169-182 ref (See N66-16536 07-04)
16. HELICOPTER CYCLIC CONTROL GRIPS—A HUMAN ENGINEERING DESIGN STUDY B. M. Corona (Aberdeen Proving Ground) p 183-196 refs (See N66-16537 07-05)
17. TECHNIQUE OF PERFORMING A MISSIONS ANALYSIS ON ARMY FIXED AND ROTARY WING AIRCRAFT S. Moreland (Aberdeen Proving Ground) p 197-208 refs (See N66-16538 07-05)

PERFORMANCE DECREMENT IN AIR MOBILITY
18. EFFECTS OF PHYSICAL LOCATION OF STIMULI IN THE VISUAL FIELD ON SIMPLE REACTION TIME J. L. Kobrick (Army Res. Inst. of Environ. Medicine) p 227-233 refs (See N66-16539 07-05)
19. PILOT PERFORMANCE IN SIMULATED LOW-ALTITUDE HIGH-SPEED FLIGHT UNDER VARIED TASK LOADING CONDITIONS S. M. Soliday (N. Am. Aviation, Columbus, Ohio) p 234-245 refs (See N66-16540 07-05)
20. ARMY LOW ALTITUDE NAVIGATION—SYSTEM CONSIDERATIONS AND PROCEDURAL SOLUTIONS R. H. Wright and T. H. Gray (Army Aviation Human Res. Unit) p 246-253 refs (See N66-16541 07-05)

PERSONNEL AND TRAINING IN ARMY AVIATION
21. PERSONAL ASPECTS OF THE ARMY AVIATION PROGRAM S. P. Kalagian (Office of Personnel Operations, Army Dept.) p 264-276 refs (See N66-16542 07-05)
22. PREDICTING SUCCESS IN ARMY AVIATION COURSES A. J. Drucker and H. Kaplan (Army Personnel Res. Office) p 277-284 ref (See N66-16543 07-05)
23. FLIGHT TRAINING QUALITY CONTROL J. O. Duffy (Army Aviation Human Res. Unit) and E. N. Anderson (Army Primary Helicopter School) p 285-293 refs (See N66-16544 07-05)
24. AUTOMATED EDUCATION IN THE TRAINING OF LOW ALTITUDE AERIAL OBSERVERS P. B. Dawkins (Army Aviation Human Res. Unit) p 294-305 (See N66-16545 07-05)

APPENDICES
25. ATTENDANCE ROSTER p 307-319
26. CURRENT WORK PROGRAMS, BIBLIOGRAPHIES AND BIOGRAPHICAL DIRECTORIES OF PROFESSIONAL PERSONNEL OF HUMAN FACTORS RESEARCH AND DEVELOPMENT ACTIVITIES OF U.S. ARMY AGENCIES p 320-458

N66-16527 Army Personnel Research Office, Washington, D. C.
INFORMATION EXTRACTION AND ASSIMILATION FROM COMMAND SYSTEM DISPLAYS
Charles H. Hammer *In* Army Res. Office Tenth Ann. Army Human Factors Res. and Develop. Conf. Oct. 1964 p 63-71 refs (See N66-16526 07-05)

Effects of conspicuity coding on time required and errors made in locating updated information was investigated by testing two groups of enlisted men who had made high scores on the Army Classification Battery and the General Technical Test. One group was presented charts of alpha-numeric information on individual display devices, the other used a large group display device; and data for each sample was analyzed separately.

Another sample of high level enlisted men was tested on both devices. While individual and group display devices did not affect performance time differently when coded updates were used, subjects reported losing their places when using the group display devices; findings show that individual displays may be used far more efficiently when uncoded updated information is presented. Errors are found to be substantially reduced by coding updated information; and there is a preponderence of errors of omission over errors of commission. Another experiment, dealing with updated symbolic information, showed more errors of omission; as the number of elements increased from 12 to 24, there was not significant performance decrement; with an increase from 2 to 6 elements, however, accuracy decreased from 97 to 69%. M.W.R.

N66-16528 Army Personnel Research Office, Washington, D. C.
THE VALUE OF A NEW REFERENCE TECHNIQUE FOR IMAGE INTERPRETATION
Harold Martinek *In* Army Res. Office Tenth Ann. Army Human Factors Res. and Develop. Conf. Oct. 1965 p 72–87 (See N66-16526 07-05)

Two new types of keys were tested in relation to image interpretation. The "rights" key with photographs plus short paragraphs giving hints or clues, was very similar both in quality and terrain to the performance measure which followed. The "error" key, which also portrayed information highly similar to that tested by actual performance, contained annotated photographs of six different common types of errors made in image interpretation. There were three matched groups of subjects; one worked with each key, the third was used as a control. It was found that the "rights" key produced no significant effect on any of the performance variables; right score, wrong score, accuracy score, average confidence score, and the average confidence of right minus wrong responses. The "error" key, however, produced a statistically significant and practical decrease in error as well as an increase in accuracy of image interpreter performance. Appendices give the verbal instructions for both the keys used and the performance measures. M.W.R.

N66-16529 Applied Psychological Services, Wayne, Pa.
EXPERIMENTS IN ELECTROCUTANEOUS INFORMATION TRANSFER
Arthur I. Siegel *In* Army Res. Office Tenth Ann. Army Human Factors Res. and Develop. Conf. Oct. 1964 p 88–98 refs (See N66-16526 07-05)

Information transfer studies indicate that electrocutaneous signals show merit for warning and alerting signal applications, particularly with the use of an auditory signal. When reactions to auditory, visual, and electrocutaneous signals were studied, it was found that the detected first signal results supported response latency data. Combinations of signals were superior, and visual signal was the poorest of the uni-modal stimuli. Suprathreshold determination experiments indicate the least missed signal, the auditory-electrocutaneous, was detected 98% of the time, whereas 59% of the visual signals were missed on first presentation. When task sharing and collateral task adequacy was investigated, it was found that no electrocutaneous and 81 visual signals were missed; tracking performance was impaired under visual stimulation, but not under electrocutaneous. When the subjective affective tone of electrocutaneous stimuli was considered through an adjectival checklist, sensations such as "moderately mild," "regular," "ticklish," and "tingling" were described. Words like "boring," "painful," and "moving" were among the least used. M.W.R.

N66-16530 Human Sciences Research, Inc., Mc Lean, Va.
EFFECTS OF TARGET/GROUND PARAMETERS ON TARGET IDENTIFICATION
John A. Whittenburg *In* Army Res. Office Tenth Ann. Army Human Factors Res. and Develop. Conf. Oct. 1964 p 101–109 refs (See N66-16526 07-05)

In order to develop a field criterion test to assess scanning and target identification skills, the effects of the following target/ground parameters on target identification were studied: square mil size over time, contrast, background, clutter, target number, time between targets, atmosphere brightness, angle of view, and percent of time in shadow. Thirty-six combat arm officers were told to report all aggressor equipment and personnel in an assigned observation area. No maps were carried during flight, but following flight, the observers were first asked to fill out standard debriefing forms and then to locate the targets on a large-scale photograph with flight path and checkpoints superimposed. An estimate of 86% of the target-target variability was obtained for 25 target items for which precise square-mil-size-over-time measures were obtained; variability was 56% for the more gross measure of square-mil-size-exposure-time for the entire set of target items. No significant correlations were obtained between observer scores and clutter index, either target time or time between targets, atmospheric brightness, angle of view, or percent in shadow. M.W.R.

N66-16531 Research Analysis Corp., Mc Lean, Va.
CONDUCTING HELICOPTER RECONNAISSANCE EXPERIMENTS WITH AIR CAVALRY ELEMENTS
Harrison N. Hopps, Barry M. Kibel, and Arthur R. Voods *In* Army Res. Office Tenth Ann. Army Human Factors Res. and Develop. Conf. Oct. 1964 p 110–118 (See N66-16526 07-05)

In a winter environment, a low-dismount tactic for helicopter reconnaissance is found to be superior to the tactics of flying high or nap-of-the-earth with pop-up. This conclusion is based on the percent of ground targets acquiring a helicopter, the total number of times detection was made, and the net number of acquisition advantages scored against helicopters. It was found, however, that helicopters used by air cavalry units acquired about 60% of the available ground targets regardless of the technique employed. Overall effectiveness of a platoon of M114A1 scout vehicles is similar to that of a single helicopter employing the nap-of-the-earth with dismount tactic. The ground scout platoon was more effective on the stationary runs and helicopter dismount on moving runs. Performance of both helicopters and ground scouts was significantly better against fluid vehicles with a moving mission than against stationary target complexes. M.W.R.

N66-16532 Technical Operations Research, Fort Benning, Ga.
TREE TOP ALTITUDE NAVIGATION ON RECONNAISSANCE MISSIONS—A REPORT OF TESTS
Earl W. Martin *In* Army Res. Office Tenth Ann. Army Human Factors Res. and Develop. Conf. Oct. 1964 p 119–132 ref (See N66-16526 07-05)

The role of aircraft type, mission profile and range, ambient illumination, weather, and crew experience upon tree-top altitude navigation for reconnaissance missions is investigated. Nap-of-the-earth flight techniques were used for the specially designed test which was made at different mission ranges during day and night. Aircraft used were low OH-13, UH-1, and OV-1; and it was found that UH-1 crews with modest levels of combined crew experience obtained the top three ranks in accuracy scores and required the least amount of time for briefing and planning activities. No apparent difference was found between fixed and rotary wing crews in terms of navigation during daylight. While nap-of-the-earth

navigation at night reduced performance, there was no relation to type of aircraft. Rain and scattering ground fog had the most effect. Further, there was little difference evidenced between performance on short and longer missions. M.W.R.

N66-16533 Army Aviation Human Research Unit, Fort Rucker, Ala.
AVIATOR PERFORMANCE IN THE LIGHT WEAPONS HELICOPTER DURING NAP-OF-THE-EARTH FLIGHT
Francis H. Thomas *In* Army Res. Office Tenth Ann. Army Human Factors Res. and Develop. Conf. Oct. 1964 p 133–141 refs (See N66-16526 07-05)

In order to assess aviator performance in a light weapons helicopter during nap-of-the-earth flight, a proficiency test was developed which required the integration of flight skills with acquisition and engagement of appropriate targets during a simulated combat mission. Twenty randomly-selected warrant officiers, recent graduates of a rotary wing aviator course, were subjected to a ten-step test. Data obtained indicate considerable variability in aviator performance; and variability on the approach sement is considered to reflect both the aviator's skill and his choice of best flight path as well as his decision of when to engage the target. A statistically reliable association is indicated between disorientation and less effective performance on measurements of time for complete run on prime target, approach time, and approach exposure time. Processing of the gun camera film obtained during flight is underway. M.W.R.

N66-16534 Army Natick Labs., Mass. Psychology Labs.
ANTHROPOMETRY OF U.S. ARMY AVIATORS
Robert M. White *In* Army Res. Office Tenth Ann. Army Human Factors Res. and Develop. Conf. Oct. 1964 p 147–153 refs (See N66-16526 07-05)

Following a general review of antropometric surveys, details are presented for such a survey conducted on 500 Army pilots in 1959. Forty-one body measurements were taken of each man, and results showed that body proportions of Army aviators were greater than those for Air Force flying personnel and Army men. Use of such findings in the design of equipment is considered. M.W.R.

N66-16535 Army Tank-Automotive Command, Center Line, Mich.
HUMAN VIBRATION RESPONSE
F. Pradko *In* Army Res. Office Tenth Ann. Army Human Factors Res. and Develop. Conf. Oct. 1964 p. 154–168 refs (See N66-16526 07-05)

An investigation was made to identify and relate whole-body human response to vehicle vibration. In the vertical and roll position, whole body random vibration tolerance is significantly greater than sinusoidal motion tolerance. Less deviation exists between random and sinusoidal pitch motion. Whole body vibration endurance is greatly increased for the vertical and pitch modes when the space orientation factor is removed by closing the eyes. Pitch vibration is found to be more intolerable than roll or vertical vibrations. When vibration input is applied to the head, vibratory tolerance is noticeably affected at all modes. To reduce these adverse effects, it is recommended that the vibration forces be oriented parallel to the head rather than in a normal direction. M.W.R.

N66-16536 Army Aviation Human Research Unit, Fort Rucker, Ala.
TRAINING ORIENTED HUMAN FACTORS ENGINEERING OF ARMY AIRCRAFT
Robert H. Wright *In* Army Res. Office Tenth Ann. Army Human Factors Res. and Develop. Conf. Oct. 1964 p 169–182 ref (See N66-16526 07-04)

The use of a control analog vertically referenced attitude indicator and an integrated VTOL flight display are considered for more economical, efficient training of aviation personnel. It is believed that such a display, in which the indications are directly analogous to the control movements required during flight, will facilitate the acquisition of aircraft control skills in a ground training course device and make the task of flying a helicopter on instruments a fairly easy one. Advantages for low altitude operations include the use of one display focused at a single point, the introduction of very little clutter, and the possibility of integrating the flight display with the navigation display. While the concepts are based primarily on the helicopter VTOL regime, they should adapt well to the requirements of fixed-wing aircraft. M.W.R.

N66-16537 Aberdeen Proving Ground, Md. Human Engineering Labs.
HELICOPTER CYCLIC CONTROL GRIPS—A HUMAN ENGINEERING DESIGN STUDY
Bernard M. Corona *In* Army Res. Office Tenth Ann. Army Human Factors Res. and Develop. Conf. Oct. 1964 p 183–196 refs (See N66-16526 07-05)

Final configuration for a standardized cyclic grip for Army helicopters was determined through a series of full-size mock-up refinements utilizing switch sizes, quick-disconnect plug size, and thumb-reach plots for overall size determination. All switch actuations on the grip are performed by the thumb with the exception of the armament fire trigger, which is actuated by the forefinger. All switch locations for thumb actuations are on the grip centerline or in a shallow arc to the immediate left and down. A quick-disconnect plug permits replacment of the grip in a few minutes as opposed to the eight or ten hours required for present grip replacement. The prototype grip is presently being flight-tested. M.W.R.

N66-16538 Aberdeen Proving Ground, Md. Human Engineering Labs.
TECHNIQUE OF PERFORMING A MISSIONS ANALYSIS ON ARMY FIXED AND ROTARY WING AIRCRAFT
Stephen Moreland *In* Army Res. Office Tenth Ann. Army Human Factors Res. and Develop. Conf. Oct. 1964 p 197–208 refs (See N66-16526 07-05)

The need for missions analyses is clearly indicated by the fact that presently used displays, controls, and work space are not compatible with the envelopes and flight missions in which the crew must perform. A task analysis format is presented, and the method for conducting the analysis is detailed. Flight crew, base, and aviation support operations are considered. The proposed technique was used for the analysis of a CV-7A Buffalo aircraft, for which two contingency phases were prepared and inserted into the block-flow analysis to cover a single-engine failure both after take off and in forward edge of the battle area. The resulting follow-on analysis of possible mission payloads, single-engine capability, and tactical situation indicated that under certain conditions the aircraft was endangered because some loads could not be jettisoned. M.W.R.

N66-16539 Army Research Inst. of Environmental Medicine, Natick, Mass.
EFFECTS OF PHYSICAL LOCATION OF STIMULI IN THE VISUAL FIELD ON SIMPLE REACTION TIME
John L. Kobrick *In* Army Res. Office Tenth Ann. Army Human Factors Res. and Develop. Conf. Oct. 1964 p 227–233 refs (See N66-16526 07-05)

Effects of changing location of visual stimuli on intentional reaction time (IRT) were investigated on a sample of 16

adults with normal vision who performed a simple manual response to flashing light stimuli located at 32 different positions in the visual field. For most lower visual hemisphere locations, IRT's were unaffected; significant decrements were observed only when stimulus locations exceeded 30° elevation above the horizontal line of sight for lateral displacements of more than 55° from the fovea. There were no significant IRT decrements at the periphery of the horizontal line of sight. These findings indicate that some flashing indicators can be safely displaced to peripheral locations to enable the prime display space to be occupied more effectively on devices requiring continuous monitoring. M.W.R.

N66-16540 North American Aviation, Inc., Columbus, Ohio.
PILOT PERFORMANCE IN SIMULATED LOW-ALTITUDE HIGH-SPEED FLIGHT UNDER VARIED TASK LOADING CONDITIONS
Stanley M. Soliday *In* Army Res. Office Tenth Ann. Army Human Factors Res. and Develop. Conf. Oct. 1964 p 234–245 refs (See N66-16526 07-05)

In order to investigate the effects of task loading on pilot performance during simulated low altitude, high speed, terrain following flight, experienced pilots were tested on flight missions in a simulator that had a total travel of approximately 12 feet and an acceleration capability of ±6G. The simulator had a functional control system and an associated analog computer for obtaining solutions to the equations of motion for a mechanized aircraft. Flights, which lasted one hour, were made under medium heavy turbulence conditions and under varying conditions of airspeed, terrain, and loading. Average altitude maintained during the flights did not vary with any of the experimental conditions, but it was found that pilots consistently flew too high when going up terrain slopes and too low when going down. Deviations from the required clearance altitude were unaffected by navigation or emergency task procedures, but increased with increasing airspeed or steepness of slopes. Reaction times of the pilots did not change with the varying conditions, nor was there any evidence of pilot fatigue. M.W.R.

N66-16541 Army Aviation Human Research Unit, Fort Rucker, Ala.
ARMY LOW ALTITUDE NAVIGATION—SYSTEM CONSIDERATIONS AND PROCEDURAL SOLUTIONS
Robert H. Wright and T. Harrison Gray *In* Army Res. Office Tenth Ann. Army Human Factors Res. and Develop. Conf. Oct. 1964 p 246–253 refs (See N66-16526 07-05)

Low altitude and nap-of-the-earth navigation is investigated in terms of mission, personnel, and hardware demands; with the conclusion that a change in both hardware and procedures is necessary to obtain proficiency in very low altitude navigation. Procedural solutions recommended, which can be used by presently available Army equipment, are of two types. One, based on the requirements of rapid initiation of tactical missions, involves shifting flight planning procedures to time periods before receipt of actual mission request or while the aircraft is airborne. The other involves the substitution of simple in-flight computations for the currently-used complex ones which produce unacceptably high error rates during low altitude flying. It is recommended that a route network analogous to those on road maps be established and documented. Minimal training could enable pilots to compensate for drift by estimating angle of drift from road maps. The sighting effect that results from being close to treetops could also be used for drift compensation. Priority hardware items are a terrain position and destination indicator as well as an instrument to handle the scheduling inherent in tactical operations and time–distance relationships. M.W.R.

N66-16542 Army Dept., Washington, D. C. Office of Personnel Operations.
PERSONAL ASPECTS OF THE ARMY AVIATION PROGRAM
Samuel P. Kalagian *In* Army Res. Office Tenth Ann. Army Human Factors Res. and Develop. Conf. Oct. 1964 p 264–276 refs (See N66-16526 07-05)

Operational aspects, the basic Army aviation career program, and related problems are discussed. Army aviator strengths are listed for the years from 1951 through 1964; and projected estimates are given through 1968. M.W.R.

N66-16543 Army Personnel Research Office, Washington, D. C.
PREDICTING SUCCESS IN ARMY AVIATION COURSES
A. J. Drucker and Harry Kaplan *In* Army Res. Office Tenth Ann. Army Human Factors Res. and Develop. Conf. Oct. 1964 p 277–284 ref (See N66-16526 07-05)

The development of a program to select enlisted personnel for fixed and rotary wing aviation pilot training was investigated by testing a population of 2000 enlisted men, 1200 officers, and 1200 ROTC cadets. Particular attention was given to selection for warrant officer candidate preflight and rotary wing training. Test batteries were developed for both interim operational use and as models for future selection programs. Battery subtests include mechanical principles, information, and functions; flight orientation, aviation information, visualization of maneuvers, instrument comprehension, complex movements, and spatial orientation. A self-description, which taps information relating to personality is for use in warrant officer batteries; a biographical information, to determine family background, educational achievements, and hobbies and other interests, is included in the commissioned officer selection program. M.W.R.

N66-16544 Army Aviation Human Research Unit, Fort Rucker, Ala.
FLIGHT TRAINING QUALITY CONTROL
John O. Duffy and Edgar N. Anderson (Army Primary Helicopter School) *In* Army Res. Office Tenth Ann. Army Human Factors Res. and Develop. Conf. Oct. 1964 p 285–293 refs (See N66-16526 07-05)

The quality control program used in the management and operation of the U.S. Army Primary Helicopter School is outlined. The program, which yields current, objective information about all phases of the training program, provides a basis for the evaluation and adjustment of standards to improve flight training practices. Since the program is in operation from day to day, it can detect and correct difficulties before they become major problems. Changes are made gradually so as to maintain smooth flow in training procedures. Research background leading to the quality control system, and the contents and operational aspects of the program are discussed. Illustrations are included which evaluate class performance, compare record of one pilot with all check pilots, and compare short and long-term school averages on various tasks. M.W.R.

N66-16545 Army Aviation Human Research Unit, Fort Rucker, Ala.
AUTOMATED EDUCATION IN THE TRAINING OF LOW ALTITUDE AERIAL OBSERVERS
Peter B. Dawkins *In* Army Res. Office Tenth Ann. Army Human Factors Res. and Develop. Conf. Oct. 1964 p 294–305 (See N66-16526 07-05)

When learning performance of two groups of noncommissioned officers was compared, it was found that an OBVERSE

II programmed instruction course taught the four basic observer skills as effectively as did 18 hours of conventional classroom instruction. On the basis of a preliminary investigation, these skills were identified as visual search, target recognition, geographic orientation, and target location. The simplicity and effectiveness of such a programmed instruction course makes it particularly suited for training under field conditions. M.W.R.

N66-16548*# National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.

DETERMINATION OF CRITICAL TRACKING TASKS FOR A HUMAN PILOT

James J. Adams, Joseph K. Kincaid, and Hugh P. Bergeron Washington, NASA, Feb. 1966 23 p refs

(NASA-TN-D-3242) CFSTI: HC $1.00/MF $0.50 CSCL 05H

Experiments have been conducted to determine the maximum amount of control element lag, and the maximum and minimum control sensitivity that can be tolerated in a single-degree-of-freedom, manually controlled compensatory tracking task. A relatively easy to satisfy error criterion was used to establish the tolerable limit. An automatic controlled element parameter adjustment was used to determine rapidly the limiting value of the parameter. An automatic model-matching method was used to determine the transfer function of the human operator in these tests. Calculations of the closed-loop system characteristics using the measured pilot transfer function show that the system is being operated with neutral closed-loop stability in the maximum lag configuration, and that the pilot is greatly restricted in his ability to identify, and adjust to, variations in control sensitivity as controlled element lag is increased. Author

N66-16550*# National Aeronautics and Space Administration. Ames Research Center Moffett Field, Calif.

A SIMULATOR STUDY TO DETERMINE PILOT OPINION OF THE TRIM CHANGES WITH POWER FOR DEFLECTED SLIPSTREAM STOL AIRPLANES

Richard F. Vomaske and Fred J. Drinkwater, III Washington, NASA, Feb. 1966 34 p refs

(NASA-TN-D-3246) CFSTI: HC $2.00/MF $0.50 CSCL 05H

A simulator study was made of the effects on pilot opinion of trim change with power. The landing approach and wave-off of a high performance deflected slipstream aircraft was simulated. A wide range of changes of pitching moments with power was investigated at several levels of static longitudinal stability with increasing power were also studied. The study showed that at the more positive levels of static longitudinal stability the lift produced by power markedly affected the apparent pitching moment due to power. In general, the pilots preferred configurations which exhibited the least trim change with power or those for which the power effects did not aggravate the stall or pitch-up margin. A comparison of the test results with current and proposed stability requirements is made. In addition, the test data are compared with flight data available. Author

N66-16566*# National Aeronautics and Space Administration, Washington, D. C.

EXTRATERRESTRIAL LIFE—A BIBLIOGRAPHY. PART II: PUBLISHED LITERATURE, 1900–1964

Dec. 1965 345 p refs

(NASA-SP-7015) GPO: HC $2.00; CFSTI: MF $1.75 CSCL 06C

An annotated bibliography of articles and books on extraterrestrial life published during the period 1900 to 1964 is presented. Although the bibliography is primarily concerned with the general subjects of extraterrestrial life and exobiology, its scope also makes provision for several particular topics that are directly pertinent to the search for extraterrestrial life. Included among these are the origin of life on earth, the suitability of other planets for the development of indigenous life, the possibility of intelligent extraterrestrial life forms, techniques and instrumentation for the detection of extraterrestrial life, the chemical basis of life including the synthesis of organic compounds from simple precursors, and terrestrial contamination of spacecraft. Several references which describe the examination and analysis of meteorites and the relevance of such studies to the subject of extraterrestrial life are also presented. C.T.C.

N66-16574*# National Aeronautics and Space Administration, Washington, D. C.

THE OXYGEN DEFICIENCY TEST—PRINCIPLES AND RELATIONSHIPS TO REGULATIVE PROCESSES IN THE ORGANISM [DER SAUERSTOFFMANGELTEST. UBER GRUNDLAGEN UND BEZIEHUNGEN ZU REGULATIVEN VORGANGEN IM ORGANISMUS]

H. Brüner, K. Dietmann, and K. E. Klein Jan. 1966 24 p refs Transl. into ENGLISH from Intern. Z. Angew. Physiol. (W. Berlin), v. 18, no. 1, 1959 p 1–12

(NASA-TT-F-9737) CFSTI: HC $1.00/MF $0.50 CSCL 06P

Systematic investigations of the efficiency deterioration in a defined oxygen deficiency ("altitude position experiment") for a large group of subjects, and mathematical evaluation of the results permit the plotting of a typical, mean deterioration curve and—via a frequency distribution of the end of efficiency—the establishment of two groups, A and B, with different behavior in oxygen deficiency. The "critical threshold" is reached, according to these findings, only after twice the time previously assumed. The mean terminal efficiency and the duration of efficiency have characteristic age curves: both increase up to age 50. Disturbances to autonomic nervous functions behave inversely to the age curves of the mean terminal efficiency. Another striking relationship exists between posthypoxic eosinopenia and the two groups, A and B. The correlations demonstrated indicate further testing of the so-called functional efficiency reserve. Author

N66-16583# Federal Aviation Agency, Oklahoma City, Okla. Civil Aeromedical Research Inst.

ATC SYSTEM ERROR AND APPRAISAL OF CONTROLLER PROFICIENCY

William F. O'Connor and Richard G. Pearson Jul. 1965 17 p refs

(AM-65-10)

This report presents suggestions for the design of an Air Traffic Control (ATC) incident-reporting system aimed at maximizing the amount of corrective feedback to the ATC system. The approach taken is system-oriented rather than controller-oriented. Included is a discussion of a philosophy of corrective and punitive action relative to controller involvement in an incident. Recommendations and examples of format are included for the design of incident-report forms and incident chronology and of a checklist to be used in periodic appraisal of controller performance. Emphasis is given in format design to use of systems and human function, rather than regulatory and procedural terminology. Implementation and data-analysis technique are also discussed. Author

N66-16584# Federal Aviation Agency, Oklahoma City, Okla. Civil Aeromedical Research Inst.

BIOMEDICAL SURVEY OF ATC FACILITIES. I: INCIDENCE OF SELF-REPORTED SYMPTOMS

George T. Hauty, David K. Trites, and William J. Berkley Mar. 1965 54 p refs

(AM-65-5)

From six en route and six terminal air-traffic-control facilities selected on the basis of differences between shift-rotation schedules and high traffic volume, 300 journeymen and assistant controllers were selected as volunteer subjects to complete a biomedical inventory daily for a period of 90 consecutive days. The inventory elicited information relating to health, morale, behavioral habits, and side effects of medications. Of the 300 subjects, 209 fulfilled the reporting requirements of the 90 days. For one of the indexes of information—stress-related symptoms—analyses of the data revealed that: (1) Facilities did differ to a statistically significant degree in the incidence of reported symptoms but these differences could not be attributed to shift-rotation schedules; and (2) 8 hours or less between two successive shifts occasioned the highest incidence of reported symptoms and more than 24 hours between shifts the next highest. Author

N66-16603*# Naval School of Aviation Medicine, Pensacola, Fla.

THE VALIDITY OF A BRIEF VESTIBULAR DISORIENTATION TEST IN SCREENING PILOT TRAINEES

Rosalie K. Ambler and Fred E. Guedry, Jr. 18 Oct. 1965 16 p refs *Its* Rept.-122

(NASA Order R-47)

(NASA-CR-70146; NAMI-947) CFSTI: HC $1.00/MF $0.50 CSCL 06N

A Brief Vestibular Disorientation Test (BVDT) has been developed that involves an assessment of reactions produced by head movements in a rotating chair. Inter-rater reliability was demonstrated by an earlier study. The present study investigated the validity of the test for predicting pilot training criteria. THE BVDT was administered to 226 naval avaiation trainees during the latter part of their pre-flight training. After the subjects had either completed training or were separated therefrom, the test results were evaluated for their relation to the following criteria: 1) students separated from flight training for all causes vs. completions; 2) tension and/or airsick separations vs. all others; and 3) airsick separations vs. all others. Relationships existed between high sensitivity scores on the BVDT and membership in the various separation groups. The airsick separation group had the highest mean score. Evidence indicates that the BVDT ratings tap a significant portion of the flight criterion variance not reached by the present prediction methods. Author

N66-16639# Naval Training Device Center, Port Washington, N. Y.

BIOPOTENTIAL SIGNALS AS A FUNCTION OF LEARNING TASK DIFFICULTY

John L. Andreassi and John D. Cavallari 19 Aug. 1965 35 p refs

(NAVTRADEVCEN-IH-34; AD-625130) CFSTI: HC $2.00/MF $0.50

The present study is concerned with biopotential responses to a learning situation in which the difficulty of materials was systematically varied. In Experiment I, eight Navy enlisted men learned three lists of nonsense syllables (0%, 53% and 100% association value), while heart rate (HR), palmar skin conductance (PSC), galvanic skin responses (GSRs), and muscle action potentials (MAPs) were monitored continuously. Subjects reported for one-hour sessions on each of three successive days. Resting levels of all biopotential signals were taken at regular intervals in each of the experimental sessions. Experiment II was conducted in the same manner with eight college students as subjects. The results showed that: (1) there were definite and large increases in all of the biopotential signals during learning as compared to the resting conditions, (2) the Navy men had significant increases in both PSC and HR with the easy and moderate lists as compared with the most difficult list, (3) the college students had non-significant increases in HR as a function of ease of list. The results for the Navy subjects were interpreted in terms of motivational factors. It was suggested that the discrepancy in results for the two groups may have been due to educational and age factors. Author (TAB)

N66-16640# Dunlap and Associates, Inc., Darien, Conn.

SYSTEMS ANALYSIS OF AAW TRAINING REQUIREMENTS

Gabriel G. Jeantheau, Birger W. Andersen, and Kenneth W. Yarnold Port Washington, N. Y., Naval Training Device Center Nov. 1965 80 p refs

(Contract N61339-1574)

(NAVTRADEVCEN-1574-1; AD-625378) CFSTI: HC $2.00/MF $0.75

The Training Analysis Procedure (TAP) is a technique for identifying areas in system operations which provide greatest payoff in system effectiveness through training. The purpose of the study was to apply the TAP to the Navy's AAW system. This application examined two levels of operator performance in systems as a function of method of training and time-to-train. The relative benefits to system performance of training various task groups via different methods are shown. The results indicate that, for the levels analyzed, combined shipboard training for subsystem groups will achieve the greatest payoff in system effectiveness. Findings are cited concerning needs in existing shipboard simulation utilization and additional shipboard training equipment. Recommendations are made for further research to develop information about operator performance for different AAW system states, for research in optimum team organization, and for research to examine the need for and requirements for generalized radar training. Author (TAB)

N66-16643# Isomet Corp., Palisades Park, N. J.

DESIGN OF A TEST MODEL FOR A SOLID ELECTROLYTE CARBON DIOXIDE REDUCTION SYSTEM Final Report, Mar.–Dec. 1964

Horace W. Chandler Wright-Patterson AFB, Ohio, AMRL, Oct. 1965 40 p ref

(Contract AF 33(657)-1498)

(AMRL-TR-65-153; AD-625482) CFSTI: HC $2.00/MF $0.50

A solid electrolyte carbon dioxide reduction system for use in a weightless condition on a planned suborbital missile flight was designed, fabricated, and tested. The system, which converted carbon dioxide to oxygen and carbon monoxide at a rate of 0.01 pounds per hour of carbon dioxide, weighted 39 pounds including all instrumentation and structural supports, occupied a volume of one cubic foot and consumed about 275 watts under steady state operating conditions. The system successfully passed specified acceleration and vibration tests and was delivered to the sponsoring agency for further use. Author (TAB)

N66-16664# Dunlap and Associates, Inc., Darien, Conn.

CONCEPTS AND PRACTICES IN THE ASSESSMENT OF HUMAN PERFORMANCE IN AIR FORCE SYSTEMS Final Report, Sep. 1964–Apr. 1965

James J. Keenan, Treadway C. Parker, and Henry P. Lenzycki Wright-Patterson AFB, Ohio, AMRL, Sep. 1965 202 p refs (Contract AF 33(615)-1754)

(SSD-65-172(514)R; AMRL-TR-65-168; AD-625041) CFSTI: HC $6.00/MF $1.25

The report describes the current practices and evaluative aspects of human performance assessment in Air Force Systems. The human performance test programs for thirty-four systems and subsystems representing the major types of systems (aeronautical, electronic, missile, and space) used by the Air Force are reviewed. For these systems, the major functional covered include: (1) Air Force policies, directives, requirements, and constraints concerning the development and assessment of system tests and human performance; (2) the behavioral sciences, approach to, and technology for, assessing human performance; and (3) Air Force practices in assessment of human performance. Throughout, the systems context, within which human performance is conceived and evaluated, is emphasized. Consequently, the techniques within the behavioral sciences for examining human performance conceptually and empirically in the system test environment is a particularly practicable part of the report. The report is supported by many tables and charts, excerpts from test directives pertinent to human performance assessment, and approximately 600 categorized references. Author (TAB)

N66-16669# Federal Aviation Agency, Oklahoma City, Okla. Office of Aviation Medicine.
BIOMEDICAL SURVEY OF ATC FACILITIES. 2: EXPERIENCE AND AGE
George T. Hauty, David K. Trites, and William J. Berkeley Mar. 1965 41 p ref
(AM-65-6)

From six enroute and six terminal air traffic control (ATC) facilities selected on the basis of differences between shift-rotation schedules and high IFR traffic volume, 300 journeymen and assistant controllers were selected as volunteer subjects to complete a biomedical inventory daily for a period of 90 consecutive days. The investory elicited information relating to health, morale, behavioral habits, and side effects of medications. Of the 300 subjects, 209 fulfilled the reporting requirements of the 90 days. For one of the indexes of information—stress-related symptoms—analyses of the data revealed that: (1) both length of experience in the air traffic control field and chronological age were related positively to the incidence of such symptoms; i.e., the greater the number of years of ATC experience and the greater the age of the subject, the higher the incidence of symptoms reported; and (2) of these two relationships, the higher and, therfore, the more significant relationship was that involving years of ATC experience. Author

N66-16712*# Massachusetts Inst. of Tech., Cambridge.
THE RESISTIVITY OF MICROORGANISMS TO THERMAL INACTIVATION BY DRY HEAT
Gerald J. Silverman 21 Jan. 1966 34 p ref
(Grant NsG-691)
(NASA-CR-70029) CFSTI: HC $2.00/MF $0.50 CSCL 06C

Kinetic studies were conducted on isolates obtained from the soil for determining the resistivity of the microorganisms to thermal inactivation by dry heat. Test spores of ***Bacillus subtilis*** var ***niger*** were used in kinetic studies as a standard for comparison. It was found that the population of the test spores, normally a red-pigmented organism, contained a number of mutants, but that their incidence is not very high. The mutants were isolated and their thermal resistivities were compared to that of the culture. Microbial spores, vegetative species, and spores from actinomycetes obtained from a previous thermal-vacuum study are being evaluated. In addition, isolates from desert soils, and air contaminants from missile assembly plants were evaluated. Assay procedures, ovens, and apparatus used are described. Data are tabulated, and plotted. L.S.

N66-16743# Little (Arthur D.), Inc., Cambridge, Mass.
STUDY AND DEVELOPMENT OF MATERIALS AND TECHNIQUES FOR PASSIVE THERMAL CONTROL OF FLEXIBLE EXTRAVEHICULAR SPACE GARMENTS
David L. Richardson Wright-Patterson AFB, Ohio, AFMRL, Sep. 1965 101 p refs
(Contract A33(615)-1904)
(AMRL-TR-65-156; AD-624886) CFSTI: HC $3.00/MF $0.75

The program encompassed an analytical and experimental investigation of the application of passive thermal control techniques to extravehicular flexible space garmets in 300 nautical mile earth orbits. Results indicate that passive thermal control by varying the absorptance and emittance of the outer surface of the garment is not possible when internal heat generated is in excess of 1500 Btu/hr. For all conditions, the suit's solar absorptance should be as small as possible and its emittance as large as possible. By controlling the conductance of the space suit wall, internal heating rates to 2000 Btu/hr are achievable when the space suit has an absorptance of 0.17 and an emittance of 0.85. A solar parasol with selected radiating properties on each side allows for higher internal heating rates. Experiments were made in a simulated noon orbit with a cylindrical section of a space suit which was first tested with an evacuated insulation and then with a helium-fillable insulation. The range of average conductance for these insulations was 0.3 to 4.0 Btu/sq ft hr F. A range of internal heat generation from 600 to 2100 Btu/hr was achieved when the evacuated insulation was filled with helium. Author (TAB)

N66-16819# Joint Publications Research Service, Washington, D. C.
PROBLEMS OF ELECTRO-AUDITORY PERCEPTION
Chih-an Liang *In its* Transl. on Communist China's Sci. and Technol., No. 275 10 Jan. 1966 p 10-23 Transl. into ENGLISH from K'O Hsueh T'ung Pao (Peking), no. 10, Oct. 1965 p 892-897 (See N66-16817 07-34) CFSTI: $2.00

Present information available on the problems of electro-auditory perception is reviewed and some of its basic principles are outlined. In applying this electrical stimulus, one of the electrodes is placed either in the external auditory canal or within the inner ear, while the other electrode is placed on another part of the body. The sound is actually produced at the interface between the skin and the electrode by the passing of an electric impulse through the human body. Differing frequencies of sound and electrical stimuli evoke in the auditory apparatus the release of nervous impulses of corresponding frequencies so that sounds can be reproduced without relying on the locality mechanism. Experiments proved that a larger area of contact between the stimulating electrode and the skin lining of the external auditory canal gave better audio signals. G.G.

N66-16933# Library of Congress, Washington, D. C. Aerospace Technology Div.
PROBLEMS OF SPACE BIOLOGY (USSR), VOLUME 4, NO. 91, 2 NOVEMBER 1965 Compilation of Abstracts
[1965] 127 p refs A.T.D. Press Spec. Issue

A compilation of abstracts from Soviet literature on problems of space biology are presented. Included are articles on cosmonaut training, space psychology; spaceflight trainers; effect of acclimatization at high altitudes on hypoxia resistance; flight clothing; hygiene; bioprocessing human wastes; cosmonaut immunity and autoflora; isolation and hypokinesia effects; prolonged hypokinesia effect on human resistance to acceleration; physiological effects of partial

restraint on monkeys; physiological effects of ammonia, CO, CO_2, and increased O_2; atmosphere selection by animals; helium-oxygen atomospheres; automatic control of plant physiology in closed systems; aeroponic cultivation of cabbage in closed system; higher plants as spaceflight biosensors; *Chlorella* nutrition; ultraviolet irradiation of plants; antiradiation compounds; radiation effects on animals; biological effects of vibration; noise effect on auditory sensitivity; weightlessness rotation effects on human physiology; human reactions to impacts; methods of measuring blood flow and nerve currents; automatic analysis of EEG's; phonetic speech analysis; information theory and physiological flight data; lipreading for spacecrew communication; recording tongue movements in speech; and man-machine speech communication. R.N.A.

N66-16942*# National Aeronautics and Space Administration. Manned Spacecraft Center, Houston, Tex.

SPACE SUIT DEVELOPMENT STATUS

Richard S. Johnston, James V. Correale, and Matthew I. Radnofsky Washington, NASA, Feb. 1966 31 p

(NASA-TN-D-3291) CFSTI: HC $1.00/MF $0.50 CSCL 06K

Space suit development, starting with the Mercury program, has progressed to its present status as a result of the changing goals of each manned spacecraft mission. The first space suits were designed primarily for protection of flight crews against the possibility of cabin pressure failure. Longer flights and extravehicular activities required design philosophies to change drastically, particularly in the areas of comfort, mobility, reliability, and life-sustaining systems. Future mission goals will require new design objectives and requirements. Author

N66-16946# RAND Corp., Santa Monica, Calif.

CYBERNETICS

M. E. Maron May 1965 8 p refs Submitted for Publication

(P-3144; AD-615710) CFSTI: HC $1.00/MF $0.50

A general review is presented of the historical background and applications of cybernetics. It is pointed out that there are still conflicting attitudes toward cybernetics and about the content of its subject matter. Since cybernetics does offer certain organizational principles which can be described and implemented, it presents both a language and set of concepts to use in obtaining an epistemological theory relating information processing to the activities of learning, thinking, knowing, and understanding. M.W.R.

N66-16954# Joint Publications Research Service, Washington, D. C.

THE CONNECTION BETWEEN MOTOR THEORY AND THE GENERAL PROBLEM OF SPEECH DISCRIMINATION

V. I. Galunov and L. A. Chistovich 11 Feb. 1966 22 p refs Transl. into ENGLISH from Akust. Zh. (Moscow), v. 11, no. 4, Oct.–Dec. 1965 p 417–426

(JPRS-34106; TT-66-30548) CFSTI: $1.00

A general model of speech discrimination is investigated, from which the motor theory of perception is reformulated. A proximity concept, which deals with similarity among elements, is considered; along with the motor theory and its experimental confirmation. Objections to the motor theory are cited, and investigation of experimental tasks relating to speech perception is considered. M.W.R.

N66-16955# Cornell Univ., New York. Allergy and Infectious Disease Div.

THE EFFECT OF HYPERBARIC OXYGEN ON MICROORGANISMS IN VITRO AND IN VIVO Final Report

[1965] 17 p

(Contract PHS PM 86-62-170)

Studies to find the effects of hyperbaric oxygen on experimental infections indicated oxygen to effectively kill *C. perfringens* and *C. tetani* in vitro. At 30 psia, however, oxygen has no more bactericidal ability than air at atmospheric pressure. Blood and muscle markedly inhibit the anticlostridial effect on oxygen. Protection by oxygen was observed when mice were infected by injection of *C. perfringens* with infusorial earth into crushed muscle. Oxygen at 30 psia was inhibitory for some aerobic bacterial strains. Mortality rates were not altered, however, by 45 psia oxygen exposure of mice who had been given intravenous injections of the same strains. M.W.R.

N66-16968*# Stanford Univ., Calif. Instrumentation Research Lab.

MEMBRANE SEPARATION

Jerry Lundstrom 6 Oct. 1965 53 p refs

(Grant NsG-81)

(NASA-CR-70190; IRL-1012) CFSTI: HC $3.00/MF $0.50 CSCL 06M

In the study of membrane separation of small enzymatic breakdown products, permeability measurements were made for glucose and carbon dioxide in order to estimate the minimum metabolic rate for conversion of glucose to carbon dioxide. This metabolic rate can then be equated with carbon dioxide production rates from glucose for various microorganisms to gain insight into the sensitivity of membrane separation devices in terms of detectable numbers of microorganisms. Semi-permeable membranes of silicone rubber and teflon were used to simulate microorganic membranes. Results are given in the form of detectability estimates which are applied to life detection problems. The mathematics are given for making these estimates both for a known microorganism and for interpreting experimental results for an unknown organism. Descriptions of experimental equipment, and graphed and tabulated results are given. D.T.

N66-16971*# Naval School of Aviation Medicine, Pensacola, Fla. Naval Aerospace Medical Inst.

COMPUTER LIBRARY LITERATURE REVIEW ON EFFECTIVENESS OF ANTIMOTION SICKNESS DRUGS

Charles D. Wood, Robert S. Kennedy, Ashton Graybiel, Robert J. Wherry, Jr., and Richard Trumbull 15 Nov. 1965 21 p refs

(NASA Order R-93)

(NASA-CR-70175; NAMI-949; AD-627012) CFSTI: HC $1.00/MF $0.50 CSCL 06O

A computer library of the antimotion sickness drug literature has been established at the Naval Aerospace Medical Institute. A review of this literature is reported here. The overall effectiveness of the antihistamines was 70.6 percent; for the belladonnas it was 50.1 percent, and for the phenothiazines it was 44.9 percent. The over-all results of British studies indicated a greater effectiveness for the belladonnas than for the antihistamines, the reverse of U.S. studies. The effectiveness of the individual drugs against motion sickness is also reported. The overall effectiveness of the drugs is compared in sea, air, and experimental-motion studies. Author (TAB)

N66-16986# Air Force Inst. of Tech., Wright-Patterson AFB, Ohio. School of Engineering.

PROPOSED COMPUTATIONS IN THE CEREBRAL CORTEX BASED ON FOURIER TRANSFORM AND SPATIAL FILTERING TECHNIQUES

George Donald Passmore (M.S. Thesis) Aug. 1965 101 p refs

(GE/EE/65-18; AD-624477) CFSTI: HC $4.00/MF $0.75

The paper employs some recent findings in the field of optics to postulate the nature of the cortical calculation. To show this, a mathematical formulation of an optical transform is discussed. A laser is used to experimentally obtain this transform. The properties of the transform are then investigated. The optical theory is compared with a specified cortical connectivity to model a basic computational cell. An array of these cells are shown to duplicate a transform process similar to the optical transform process. The calculation performed by the array is then simulated on the IBM 7094 computer for various input patterns. Author (TAB)

N66-16990# Naval Submarine Medical Center, Groton, Conn.
STUDIES OF CILIARY MUCUS TRANSPORT IN A CLOSED CABIN ATMOSPHERE
Robert E. Sonnenburg 2 Dec. 1964 17 p refs *Its* Vol. 23, No. 25
(Rept.-443; AD-624754) CFSTI: HC $1.00/MF $0.50

In an attempt to determine what effect, if any, a sealed cabin atmosphere might have on living tissue, observations of frog tissue were made during a routine patrol of a Fleet Ballistic Missile (FBM) submarine. Ciliary mucus flow rates were determined in the esophageal tissue of frogs, since results with these tissues have proved comparable to mammalian respiratory cilia. Bottles of surface air were taken aboard the submarine to permit comparison of tissues exposed to this normal air with those exposed to the ambient air of the submarine. Results showed a definite decrement in ciliary activity in those tissues exposed to submarine air. In addition, sprouted seeds of vegetables and flowers were taken aboard. Despite all efforts to maintain their nutrition and light exposure, they ceased to grow and after 3 weeks had turned brown and died. Ion activity which might account for these results is discussed and further investigation is recommended. Author (TAB)

N66-16991# Naval Submarine Medical Center, Groton, Conn.
SELECTION OF MEN FOR HAZARDOUS DUTY FROM INDICES OF INDIVIDUAL DIFFERENCES IN AUTONOMIC NERVOUS SYSTEM REACTIVITY
Benjamin B. Weybrew 6 Feb. 1965 16 p refs *Its* Mem. Rept.-65-1
(AD-624783) CFSTI: HC $1.00/MF $0.50

The purpose of the report is to integrate the results of a series of studies aimed at assessing the validity of peripheral autonomic indices (respiration rate, tremor, palmar conductance etc.) for predicting individual differences in adjustment to a stressful environment. Based largely upon palmar electrodermal indices, autonomic displacement and recoverability to laboratory induced stress has moderate to high predictive validity with respect to submariner adjustment ratings. Functional autonomic differences may therefore be indicative of underlying emotional traits which in turn are related to differences in adjustment to certain hazardous environments. The data presented in this paper suggest that selected peripheral indices of autonomic function are usefully valid measures of an individual's ability to adapt to the stresses of certain hazard environments. The possibilities of these measures as selection techniques are indicated. Author (TAB)

N66-16997# Army Medical Lab. (5th), St. Louis, Mo.
SAMPLING PROGRAM FOR AIRBORNE RADIOACTIVITY
Donald R. Bowie 31 Jan. 1965 30 p refs
(RB-65-1; AD-624516) CFSTI: HC $2.00/MF $0.50

The basic program involves the collection of particulate matter from a known volume of air. The collector is a high volume sampler equipped with a glass fiber filter. The gross beta radiation emitted by a known fraction of the sample is measured in an appropriate instrument, and the concentration is calculated for the sampling period. TAB

N66-17005# Maryland Univ., College Park. Inst. for Fluid Dynamics and Applied Mathematics.
DENATURATION AND RENATURATION OF DNA: I: EQUILIBRIUM STATISTICS OF COPOLYMERIC DNA
Elliott W. Montroll and Narendra S. Goel Nov. 1965 56 p refs
(Contract Nonr-592(22))
(BN-425; AD-624441) CFSTI: HC $3.00/MF $0.50

The one dimensional Ising model, with nearest neighbor correlation only, suitably modified, is used to explain the observed linear dependence of melting temperature of copolymeric DNA with (gc) content. Transition curves are plotted for regular, random, and Markoff distribution of base pairs for various values of a correlation parameter, U, between nearest neighbor bonds. Exact analytic formulae are given for fraction of bonds intact at a particular temperature for various regular distributions for all U and aproximate ones for random and Markoff distributions for small U. A scheme is indicated for further improvement. The model, in principle, makes it possible to estimate the statistical distribution of base pairs from the detailed shape of the transition curve. Author (TAB)

N66-17022# Institute for Perception RVO-TNO, Soesterberg (Netherlands).
CORFICAL CONTROL OF EYE MOVEMENTS AND VISUAL THRESHOLD Final Report, Jun. 1, 1964–Jun. 1, 1965
Maarten A. Bouman [1965] 45 p refs
(Contract DA-91-591-EUC-3346)
(AD-624790) CFSTI: HC $2.00/MF $0.50

Experimental investigations were conducted on the increase in the threshold for visual perception which occurs just prior to, and during eye movements. To measure the visual threshold in the vicinity of eye movement an apparatus was constructed having alternately burning lights. Some time after switching, a flash of short duration of controlled intensity was presented which fell in the vicinity of the subject's eye movement. Eye movements were measured by reflection of light from the surface of the eye. The reflection data is fed to a pattern recognizer which records the onset of eye movement. The subject records whether or not he saw the flash. The threshold for perception as a function of eye movement was measured. The equipment could present one or two light flashes to the subject. Each light source had a dimater of 7 minutes of arc, with an angular separation between the two lights up to several degrees. It was found that the detection of one light flash would facilitate the detection of the other light flash. For example, if the probability of detecting either light, separately, was 0.3, the probability of detecting both together was 0.2, rather than 0.09. This facilitation experiment was then repeated with a resting eye, with the following results, which hold for both the light adapted and the dark adapted eye: (1) It is most likely a retinal effect, which affects both rods and cones equally. (2) Outside the area of summation the distance between the two flashes is of minor importance. Author (TAB)

N66-17053*# International Business Machines Corp., Rockville, Md. Federal Systems Div.
ORL EXPERIMENT PROGRAM, VOLUME B. PART VII: BIOMEDICINE/BEHAVIOR
21 Feb. 1966 110 p refs
(Contract NASw-1215)
(NASA-CR-70356) CFSTI: HC $4.00/MF $0.75 CSCL 06S

Relative to synthesizing an experiment program for Orbital Research Laboratories (ORLs), an illustration is given of the application of the synthesis approach to the biomedicine/behavior scientific and technical area. The objective of this area is to determine the conditions required to assure man's physiological well being and performance effectiveness for undertaking advanced space missions. Consideration is given to

background material which includes discussions of weightlessness, radiation, periodicity, and synergistic effects; identification of selected knowledge requirements; and derivations of experiment requirements. These derivations include equipment functional and supporting research requirements, and prospective orbital activities. Illustrative selected knowledge requirements and discussions of representative experiments are appended. C.T.C.

N66-17058*# International Business Machines Corp., Rockville, Md. Federal Systems Div.

ORL EXPERIMENT PROGRAM, VOLUME B. PART XII: BIOSCIENCE

21 Feb. 1966 123 p refs

(Contract NASw-1215)

(NASA-CR-70342) CFSTI: HC $4.00/MF $1.00 CSCL 06F

Relative to determining a framework for constructing an experiment program for Orbital Research Laboratories (ORLs), an illustration is given of the application of the synthesis approach to the bioscience scientific and technical area. Consideration is given to the identification of selected knowledge requirements and the derivation of experiment requirements. These include equipment functional and supporting research requirements, and prospective orbital activities. Appendices include illustrations and identifications of selected knowledge requirements, relativity experiments using an artificial earth satellite, and indicative phenomena and functional requirements. C.T.C.

N66-17065# Naval Radiological Defense Lab., San Francisco, Calif.

HOMOGRAFT RESPONSE AND HEMAGGLUTININ PRODUCTION BY SENSITIZED THYMECTOMIZED IRRADIATED ADULT MICE

Marvin L. Tyan and Leonard J. Cole 13 Oct. 1965 21 p refs

(USNRDL-TR-920; AD-624485) CFSTI: HC $1.00/MF $0.50

Thymectomized and nonoperated male $B_6D_2F_1$ mice were sensitized by the following means: (1) an allogenic (A/HeJ) skin graft; (2) three sc injections of A/HeJ spleen cells in Freund's complete adjuvant; and (3) three ip injections of A/HeJ spleen cells. One week after the last injection, thymectomized and nonoperated mice from each group received 870 rad whole-body X-radiation. The mice were grafted with A/HeJ and rat skin 102, 143, 184, 205 and 225 days after irradiation. Sera were obtained frequently for anti-A/HeJ and anti-rat hemagglutinins. The results indicated that although both hemagglutinin production and the homograft response were initially greatly impaired by thymectomy and lethal irradiation, repeated antigenic challenge resulted in return of the specific homograft response to near normal reactivity while antibody production became progressively more impaired. The results suggested that (1) antibody production and homograft sensitivity are manifestations of immunologic responses by associated by distinct cell populations, (2) antibody production is more thymus-dependent than is the homograft response and (3) the method of sensitization employed determines both the relative and absolute number of 'sensitized cells' produced within each cell population. Author (TAB)

N66-17072*# Harvard Univ., Boston, Mass. Thorndike Memorial Lab.

A STUDY OF PHYSIOLOGICAL MECHANISMS AND INTER-RELATIONS BETWEEN SYSTEMIC AND REGIONAL BLOOD VOLUME. BLOOD FLOW AND ELECTROLYTE BALANCE Interim Progress Report

Walter H. Abelman and Laurence E. Earley 31 Dec. 1965 10 p refs

(Grant NsG-595)

(NASA-CR-70316) CFSTI: HC $1.00/MF $0.50 CSCL 06P

Results are reported of renal hemodynamics, sodium excretion, and extracellular volume studies conducted with dogs and humans; studies on the effect of mitral stenosis and atrial fibrillation on the excretion of a sodium load in humans, with observations on the effect of cardioversion; and studies on the effect of abnormal circulatory states on the response of heart rate and blood pressure to upright tilt in humans. Relative to these studies, experiments are discussed and conclusions are summarized. C.T.C.

N66-17079*# Naval School of Aviation Medicine, Pensacola, Fla. Naval Aerospace Medical Inst.

THE VALIDITY OF A BRIEF VESTIBULAR DISORIENTATION TEST IN SCREENING PILOT TRAINEES

Rosalie K. Ambler and Fred E. Guedry, Jr. 18 Oct. 1965 16 p refs

(NASA Order R-47)

(NASA-CR-70306; NAMI-947) CFSTI: HC $1.00/MF $0.50 CSCL 06N

A Brief Vestibular Disorientation Test (BVDT) has been developed that involves an assessment of reactions produced by head movements in a rotating chair. Inter-rater reliability was demonstrated by an earlier study. The present study investigated the validity of the test for predicting pilot training criteria. The BVDT was administered to 226 naval aviation trainees during the latter part of their pre-flight training. After the subjects had either completed training or were separated therefrom, the test results were evaluated for their relation to the following criteria: (1) students separated from flight training for all causes vs. completions; (2) tension and/or airsick separations vs. all others; and (3) airsick separations vs. all others. Relationships existed between high sensitivity scores on the BVDT and membership in the various separation groups. The airsick separation group had the highest mean score. Evidence indicates that the BVDT ratings tap a significant portion of the flight criterion variance not reached by the present prediction methods. Author

N66-17082*# Melpar, Inc., Falls Church, Va.

HUMAN PERFORMANCE CONTROL MONITORING SYSTEMS Interim Report No. 2

J. M. Gervinski and R. E. Mirabelli 15 Jan. 1966 27 p ref

(Contract NASw-1085)

(NASA-CR-70340) CFSTI: HC $2.00/MF $0.50 CSCL 05H

Basic features are described for a computer program which was written to simulate the dynamics of a second order servosystem under both automatic and manual control. This was constructed in order to determine if trainable logic can be designed to take over the control function of a servo plant by monitoring of human performance, given that failures and/or changes in plant characteristics have occurred in an automatic control system. The operating mode of the system is determined by an external sense switch on the computer, and external sense switches also control the torque value when in the manual mode. The monitoring of this manual mode results in the training of the adaptive logic. Listings for the computer program are appended. C.T.C.

N66-17088*# Army Biological Labs., Fort Detrick, Md. Physical Defense Div.

A STUDY OF DRY HEAT STERILIZATION OF MICROORGANISMS AT 105°C

Dorothy M. Portner 26 Jan. 1966 14 p refs Protect. Branch Rept. of Test No. 6-66

(NASA Order R-35)

(NASA-CR-70321) CFSTI: HC $1.00/MF $0.50 CSCL 06M

Results of an investigation to determine the effectiveness of dry heat at 105°C in sterilizing microorganisms are reported. Thermal death times were determined for (1) natural microbial contamination from aerial fallout or dried bacterial spores on glass surfaces, either embedded or not embedded in plastic; (2) bacterial spores in soil, either embedded or not embedded in plastic; and (3) the natural flora of microorganisms of soil. Among the conclusions are that the time required to achieve sterility varied from 24 to 336 hours. Sterility would be achieved in 24 hours for about 10^6 *B. subtilis* var *niger* dried in glass; but when embedded in plastic, the deata time increased to 48 hours. For the glass slides contaminated by aerial fallout, the contamination level was only about 40 microorganisms per slide; but after a 24 hour heat treatment, contamination was found in one sample out of 14 embedded in plastic. Soils artificially contaminated with 10^6 or less *B. subtilis* var *niger* spores appeared to be sterile after 48 hour exposure. C.T.C.

N66-17120# Louisville Univ., Ky. Performance Research Lab.

ELECTRIC SPARK STIMULATION OF THE SKIN

Kent Te Vault (M.A. Thesis) 10 Nov. 1965 31 p refs (Contract DA-49-193-MD-2525) (AD-624848) CFSTI: HC $2.00/MF $0.50

On the basis of the data it was concluded that the technique devised by Bishop for exploring the skin's sensory mechanisms is not as simple and as straightforward as it at first appeared. It was, furthermore, not possible to replicate Bishop's findings with regard to simultaneous two-point stimulation. The method of single-unit analysis of the skin is not to be discarded easily, however. Only the method of capacitor-discharge spark stimulation must be drastically revised or abandoned. In order that spark stimulation be effective it is necessary that some means be found to control both the number and spacing of the spikes. This may be achieved by some mechanical or electrical device, but the assumption of a 'single, brief shock' stimulus remains violated. The only remaining desirable change of Bishop's technique, that of avoiding actual contact with the skin, was abandoned by Bishop himself in favor of a thin wire electrode. In light of these facts, it is probably advantageous to look elsewhere for a stimulus source. There are available commercially a number of electronic stimulator devices which are capable of producing single pulses or pulse trains with a considerable degree of control. It is probable that one of these devices, with its output applied to a suitably small area, would provide the needed tool for a truly fruitful exploration of single sensory units of the skin. Author

N66-17126*# Israel Program for Scientific Translations, Ltd., Jerusalem.

THE EFFECT OF THE GAS MEDIUM AND PRESSURE ON BODY FUNCTIONS, COLLECTION III

M. P. Brestkin, ed. 1965 311 p refs Transl. into ENGLISH of the book "Funktsii Organizma v Usloviyakh Izmenennoi Gazovoi Sredy, III" Moscow, Izd. "Nauka", 1964 Published for NASA and NSF (NASA-TT-F-358; TT-65-50136) CFSTI: HC $6.00/MF $1.75 CSCL 06S

Third collection of papers is presented on the effect on the body of increased and reduced total and partial pressures of various gases in ordinary air, as well as artificial air mixtures used in deep-water descents, with special coverage given to the study of caisson disease phenomena. For individual titles see N66-17127–N66-17162.

N66-17127* Israel Program for Scientific Translations, Ltd., Jerusalem.

THE PERMISSIBLE SUPERSATURATION COEFFICIENTS IN HUMAN BEINGS BREATHING AIR AND A HELIUM–OXYGEN MIXTURE [O KOEFFITSIENTAKH DOPUSTIMOGO PERESYSHCHENIYA U LYUDEI PRI DYKHANII VOZDUKHOM I GELIO-KISLORODNOI SMES'YU]

A. I. Aleksandrov and A. P. Brestkin *In its* Effect of the Gas Medium and Pressure on Body Functions, Collection III 1965 p 5–9 refs (See N66-17126 07-04) CFSTI: HC $6.00/MF $1.75

It has been determined that nitrogen forms more stable supersaturated liquid solutions than helium. In this connection it was interesting to determine the permissible supersaturation coefficient (PSC) in human beings breathing air and a helium–oxygen mixture. At the time of our experiments in 1950 there was no experimental data in the literature on PSC values in human beings breathing a helium–oxygen mixture. The values of the PSC used in calculations of deepwater helium–oxygen decompression conditions were determined mathematically by the results of practical descents by divers to great depths, and should therefore be regarded as arbitrarily calculated figures. The values of the PSC were determined in eight professional divers, from 20 to 26 years of age, and in the authors of this work, 28 and 38 years old. The investigation was made in a large pressure chamber. Four subjects participated simultaneously in the same experiment. Author

N66-17128* Israel Program for Scientific Translations, Ltd., Jerusalem.

RELATIONSHIP BETWEEN THE SUPERSATURATION COEFFICIENT OF GAS–LIQUID SYSTEMS AND THE TENSION OF DISSOLVED GAS [ZAVISIMOST' KOEFFITSIENTA PERESYSHCHENIYA SISTEM GAZ–ZHIDKOST' OT NAPRYAZHENIYA RASTVORENNOGO GAZA]

A. P. Brestkin *In its* Effect of the Gas Medium and Pressure on Body Functions, Collection III 1965 p 10–17 refs (See N66-17126 07-04) CFSTI: HC $6.00/MF $1.75

It has been noted that the permissible saturation coefficient (PSC) for divers decreases with increased depth of descent and time spent at the bottom, i.e., with increase in the parameters determining the tension of an indifferent gas in the body tissues. Evidently, such a reduction in the PSC is connected not only with functional changes of the body but also with change of the capacity of the tissues for retaining the dissolved indifferent gas in a state of supersaturation. In this connection, it was very interesting to study the relationship between the tension of the dissolved gas and the supersaturation coefficient (SC) of the solution, the value of which also characterizes the capacity of the fluid for retaining the dissolved gas in a supersaturated state. The study consisted of two series of experiments: in the first a study was made of supersaturated gas–fluid solutions in the pressure range from 1 to 8 atm; in the second, from 10 to 200 atm. The experiments were performed with two fluids (water and benzene) and with three gases (helium, nitrogen, and carbon dioxide). Author

N66-17129* Israel Program for Scientific Translations, Ltd., Jerusalem.

STUDY OF THE SAFE SUPERSATURATION OF THE BODY WITH INDIFFERENT GASES AT DIFFERENT PRESSURES [ISSLEDOVANIE BEZOPASNOGO PERESYSHCHENIYA ORGANIZMA INDIFFERENTNYMI GAZAMI PRI RAZLICHNYKH DAVLENIYAKH]

A. P. Brestkin, P. M. Gramenitskii, and N. Ya. Sidorov *In its* Effect of the Gas Medium and Pressure on Body Functions, Collection III 1965 p 18–27 refs (See N66-17126 07-04) CFSTI: HC $6.00/MF $1.75

In a study of decompression disorders, several circumstances associated with the specific properties of the supersaturated gas–fluid solutions were considered to determine the degree of supersaturation of the animal or human body with indifferent gases at which the first symptoms appear. The concepts of maximum and minimum supersaturation are discussed, and expressions are formulated for the permissible supersaturation coefficient (PSC), the supersaturation coefficient (SC), and the safe supersaturation coefficient (SSC). Details are also given on animal studies to determine the gas formation conditions which lead to functional disorders developing during decompression. Results indicate: (1) It is preferable to determine the limiting supersaturation of body tissues with an indifferent gas by the ratio of the gas tension to the ambient pressure after decompression, than by the difference between these figures. (2) With increase in the tension of the dissolved indifferent gas, the value of the limit increases sharply. (3) With increase in the tension of the dissolved indifferent gas, the value of SSC decreases. M.G.J.

N66-17130* Israel Program for Scientific Translations, Ltd., Jerusalem.

COMPARATIVE DETERMINATIONS OF THE PERMISSIBLE SUPERSATURATION VALUE OF THE HUMAN BODY WITH INDIFFERENT GASES UNDER DIFFERENT CONDITIONS [SRAVNITEL'NOE OPREDELENIE VELICHINY DOPUSTIMOGO PERESYSHCHENIYA ORGANIZMA CHELOVEKA INDIFFERENTNYMI GAZAMI V RAZNYKH USLOVIYAKH]

G. L. Zal'tsman and I. D. Zinov'eva *In its* Effect of the Gas Medium and Pressure on Body Functions, Collection III 1965 p 28–33 refs (See N66-17126 07-04) CFSTI: HC $6.00/MF $1.75

An accelerated method for determining the degree of permissible supersaturation is described. In one test series, comparisons were made of the permissible supersaturation value after the inhalation of air, a 20% helium–oxygen mixture, a 50% air–helium mixture, and a 75% air–helium mixture. The tabulated results show that the maximum pressure, which may be safely reduced to normal after an hour's exposure, depends on the indifferent component of the breathing mixture. It was also noted that the decompression sickness symptoms differed substantially with the various gas mixtures. In other experiments, a comparative determination was made of the permissible supersaturation value in two subjects at three different initial pressures; these were safe surfacing pressure, normal atmospheric pressure with subsequent rarefaction, and the greatest prenarcotic air pressure. Data indicate that the higher the initial pressure, the greater the permissible supersaturation value. From the overall study results, it was concluded that the differential coefficient should be used for calculating decompression routines. M.G.J

N66-17131* Israel Program for Scientific Translations, Ltd., Jerusalem.

SOME CONDITIONS FOR THE INCREASE IN BODY RESISTANCE TO DECOMPRESSION DISORDERS UNDER THE REPEATED EFFECTS OF DECOMPRESSION [O NEKOTORYKH USLOVIYAKH POVYSHENIYA USTOICHIVOSTI ORGANIZMA K DEKOMPRESSIONNYM NARUSHENIYAM PRI POVTORNYKH VOZDEISTVIYAKH DEKOMPRESSII]

V. A. Aver'yanov *In its* Effect of the Gas Medium and Pressure on Body Functions, Collection III 1965 p 34–39 refs (See N66-17126 07-04) CFSTI: HC $6.00/MF $1.75

The possibility of increasing body resistance to decompression disorders by frequently repeated decompressions was examined. In experiments conducted to determine the safe supersaturation coefficient (SSC) with nitrogen, dogs were kept 4 to 6 hours under increased pressure known to be safe, and then subjected to rapid decompression to the surface level. Results showed that repeated decompression from pressures, at which decompression disorders occur, does not increase body resistance; in fact, it may even decrease it. The initial use of high pressures exceeding the threshold has an even less favorable effect on body resistance. It was concluded that the optimum condition for increased body resistance is the initial application of a safe pressure, a gradual increase in it, and a drop to a lower pressure after decompression symptoms develop. M.G.J.

N66-17132* Israel Program for Scientific Translations, Ltd., Jerusalem.

PROVOCATION OF CAISSON DISEASE SIGNS IN ANIMALS EMERGING FROM INCREASED PRESSURE BY SUBSEQUENT ASCENT TO ALTITUDE [PROVOKATSIYA KESSONNYKH YAVLENII U ZHIVOTNYKH VYSHEDSHIKH IZ POD POVYSHENNOGO DAVLENIYA, PUTEM POSLEDUYUSHCHEGO POD'EMA IKH NA VYSOTU]

P. M. Gramenitskii and A. A. Savich *In its* Effect of the Gas Medium and Pressure on Body Functions, Collection III 1965 p 40–46 refs (See N66-17126 07-04) CFSTI: HC $6.00/MF $1.75

Several experiments were performed to test the theory that gas bubble formation in the body after decompression under increased pressure can occur asymptomatically. In the studies, the animals were exposed to the effect of a rarified atmosphere at various periods after decompression from increased pressure. Use was made of increased pressures which were not followed by typical decompression disorders, and degrees of rarefaction which could not cause these disorders. The most interesting results were identified as those cases in which caisson symptoms rapidly developed during ascent to altitude, after the animal emerged from safe increased pressure. In explanation of this phenomenon, the supposition was advanced that prior to ascent gas bubbles had formed despite the absence of external symptoms of typical decompression disorders. It was concluded that gas bubbles may be formed and preserved for a long time in the body without functional disorders occurring; and that provocation of caisson disorders by ascent to altitude is a criterion of the presence of silent gas bubbles in the body, and the measure of its supersaturation with nitrogen. M.G.J.

N66-17133* Israel Program for Scientific Translations, Ltd., Jerusalem.

RESULTS OF EXPERIMENTAL ANALYSIS OF DECOMPRESSION AIR EMBOLISM [REZUL'TATY EKSPERIMENTAL'NOGO ANALIZA DEKOMPRESSIONNOI AEROEMBOLII]

P. M. Gramenitskii and A. A. Savich *In its* Effect of the Gas Medium and Pressure on Body Functions, Collection III 1965 p 47–56 refs (See N66-17126 07-04) CFSTI: HC $6.00/MF $1.75

Several animal experiments were conducted to study the conditions which affect gas formation in the blood vessel, the sequence of gas bubble appearance in different blood vessels, and the physiological reactions which they induce. The resulting data confirmed that the air embolic process in the venous system represents the basic phenomenon in pathogenesis of overt decompression disorders. It was also found that when the body is considerably supersaturated with nitrogen for a comparatively long time after decompression (at 3.25 atm, 15 min), all conditions are present for gas formation in the artery. However, because of the rapid flow of the arterial blood, the gas bubbles in it usually do not increase to visible size. The idea

of slow nitrogen diffusion in the lungs and tissues was identified as the most important experimental finding, and verification of this theory was recommended. M.G.J.

N66-17134* Israel Program for Scientific Translations, Ltd., Jerusalem.
THE EFFECT OF DIFFERENT GASES ON THE ORGANISM AFTER INTRAVENOUS ADMINISTRATION [DEISTVIE NA ORGANIZM RAZLICHNYKH GAZOV PRI IKH VNUTRI VENNOM VVEDENII]
P. M. Gramenitskii, A. A. Savich, and K. S. Yurova *In its* Effect of the Gas Medium and Pressure on Body Functions, Collection III 1965 p 57–63 refs (See N66-17126 07-04) CFSTI: HC $6.00/MF $1.75

Injections of carbon dioxide, oxygen, air, and a helium–oxygen mixture were introduced into the auricular veins of rabbits to study respiratory and circulatory reactions. It was found that the changes which occur are similar to decompression symptoms, and the point was made that the artificial air embolism can constitute an experimental model for general decompression disorders. Data also showed: (1) The body suffered most severely from the nitrogen intravenous injection; tolerated helium appreciably better; oxygen, even better; and carbon dioxide easily. This is explained by the different diffusion capacities of each and, in the case of oxygen and carbon dioxide, by their possible chemical combination in the body. (2) The results of artificial air embolism depend to a great degree on the diffusion relationships created in the lungs between the air and the gas mixture filling the alveoli. Consequently, in eliminating air emboli, the leading part is played by diffusion of their constituent gases from the pulmonary vessels into the alveoli. M.G.J.

N66-17135* Israel Program for Scientific Translations, Ltd., Jerusalem.
TRAINING OF THE ORGANISM FOR ARTIFICIAL AIR EMBOLISM [TRENIROVKA ORGANIZMA K ISKUSSTVENNOI AEROEMBOLII]
P. M. Gramenitskii and K. S. Yurova *In its* Effect of the Gas Medium and Pressure on Body Functions, Collection III 1965 p 64–70 refs (See N66-17126 07-04) CFSTI: HC $6.00/MF $1.75

The possibility of increasing body resistance to air embolism was studied by means of regularly repeated intravenous injections of air into animals. Dosages necessary to produce initial, very transitory functional changes; overt disorders; and irreversible disorders and death were determined. Details are given on the experiments, and the tabulated data show an increased resistance to the harmful effect of air embolism as a result of repeated regular air injections, starting with comparatively small doses (0.6 ml). The rabbits acquired the capacity of tolerating doses of 1.0, 1.5, and even 2 ml equally well; several animals withstood an injection of over 4 ml, showing a tolerance for quantities known to be lethal. Experiments were performed to determine how quickly the body eliminated air emboli introduced into the blood. Results indicate that after many days' training with air injection, the rabbits showed no functional disorders in the ascent to altitude even after a short interval (45 min to 1 hour) between injection and ascent. It was concluded that such training enables the body to rapidly eliminate injected air emboli. M.G.J.

N66-17136* Israel Program for Scientific Translations, Ltd., Jerusalem.
THE ROLE OF THE HYPOXEMIC FACTOR IN DEVELOPMENT OF DECOMPRESSION DISORDERS [O ROLI GIPOKSEMICHESKOGO FAKTORA V RAZVITII DEKOMPRESSIONNYKH RASSTROISTV]
P. M. Gramenitskii and A. A. Savich *In its* Effect of the Gas Medium and Pressure on Body Functions, Collection III 1965 p 71–75 refs (See N66-17126 07-04) CFSTI: HC $6.00/MF $1.75

Studies were conducted to determine the blood gases in animals exposed to the effect of increased pressure and subsequent decompression, and also to artificial air embolism. Experimental procedures are detailed; and changes in the gas content of the arterial blood in dogs, with the development of caisson disease symptoms, are tabulated. Findings indicated that the onset of severe forms of decompression disorders is always accompanied by a pronounced hypoxemia and hypercapnia; hypoxemia and hypercapnia result from air embolism in capillaries of the lesser circulation; changes in the gas content (oxygen and carbon dioxide) of the arterial blood are an inseparable component of the body's reaction to decompression; and reduced oxygen content of the arterial blood in animals exposed to subliminal increased pressures usually occurs in the absence of typical decompression symptoms. M.G.J.

N66-17137* Israel Program for Scientific Translations, Ltd., Jerusalem.
EXPERIMENTAL AIR EMBOLISM UNDER CONDITIONS OF HYPOTHERMIA AND HYPERTHERMIA [EKSPERIMENTAL'NAYA AEROEMBOLIYA V USLOVIYAKH GIPOTERMII I GIPERTERMII]
V. A. Aver'yanov and K. S. Yurova *In its* Effect of the Gas Medium and Pressure on Body Functions, Collection III 1965 p 76–83 refs (See N66-17126 07-04) CFSTI: HC $6.00/MF $1.75

The question of how altered temperature conditions affect the development of air embolism, and the resistance of the body to its deleterious influence, is examined. Experimental results showed increased resistance of overheated and particularly overcooled animals to air embolism; and some changes of the body in a state of hyper- or hypothermia to intravenous air injection. The differences of these resistance mechanisms are defined: in hyperthermia they consist chiefly of reactions which contribute to a more rapid removal of air bubbles from the blood stream. It is also pointed out that in hypothermia, reduced sensitivity of the central nervous system to unfavorable reflex influences caused by gas bubble, and to hypoxemia accompanied by air embolism, is of major importance. M.G.J.

N66-17138* Israel Program for Scientific Translations, Ltd., Jerusalem.
COMPARATIVE CHARACTERISTICS OF RESPIRATORY AND CIRCULATORY REACTIONS OF UNANESTHETIZED DOGS TO DECOMPRESSION AND ARTIFICIAL AIR EMBOLISM [SRAVNITEL'NAYA KHARAKTERISTIKA REAKTSII DYKHANIYA I KROVOOBRASHCHENIYA NENARKOTIZIROVANNYKH SOBAK NA DEKOMPRESSIONNUYU I ISKUSSTVENNUYU AEROEMBOLIYU]
V. I. Arsen'eva, P. M. Gramenitskii, and K. S. Yurova *In its* Effect of the Gas Medium and Pressure on Body Functions, Collection III 1965 p 84–91 refs (See N66-17126 07-04) CFSTI: HC $6.00/MF $1.75

Frequently repeated long-term experiments were conducted on respiratory and cardiovascular reactions of unanesthetized animals to decompression and artificial air embolism. Studies were also undertaken to determine whether training for artificial air embolism is effective with respect to decompression, and, conversely, whether increased resistance to the decompression effect results in increased resistance to intravenous injection of several gases simultaneously. Data show similar respiratory and cardiac activity changes in intact

animals under the effect of decompression and intravenous air injection. In both cases, dyspnea always occurs with greater or lesser increase in pulmonary ventilation, and the pulse usually slows. Results also indicate: (1) Training the organism for artificial air embolism increases its resistance to the effects of decompression; likewise, training for decompression effects increases resistance to intravenous gas injection. (2) Increased body resistance to decompression effects when they are repeated frequently is based, in part, on the perfection of respiratory and cardiovascular reactions produced by air embolism. M.G.J.

N66-17139* Israel Program for Scientific Translations, Ltd., Jerusalem.

SIMPLE "CALCULATED TISSUE" MODELS [PROSTYE MODELI "RASCHETNOI TKANI"]

V. A. Livshits *In its* Effect of the Gas Medium and Pressure on Body Functions, Collection III 1965 p 92-95 refs (See N66-17126 07-04) CFSTI: HC $6.00/MF $1.75

A method of calculating continuous decompression conditions is presented, based on an equation for the voltage at the capacitor of an RC circuit. An analysis was also made of the conditions under which the permissible supersaturation coefficient (ratio of gas tension in the leading tissue to the total pressure), or the degree of permissible supersaturation (difference between gas tension in the leading tissue and the total pressure) remain constant. In this technique, the RC circuit is an electric analogy of the calculated tissue, in that the saturation and desaturation processes of the tissue with the gas and the charge on the capacitor are mathematically identical. The electric analogy permitted construction of an electronic model of the tissues of a diver. Periodic trapezoidal voltage pulses are fed, simulating descent or ascent of a diver to a certain depth and stay at the depth; the voltage in the capacitors is observed on the oscillograph. Electrical analogies are given for all magnitudes and processes connected with calculating decompression conditions. Also discussed is the application of a simple hydraulic model for successive chemical reactions to simulate saturation of the calculated tissue with an indifferent gas. M.G.J.

N66-17140* Israel Program for Scientific Translations, Ltd., Jerusalem.

THE MECHANISM OF RESPIRATORY AND CIRCULATORY CHANGES IN DOGS UNDER THE INFLUENCE OF HIGH OXYGEN PRESSURES [K MEKHANIZMU IZMENENII DYKHANIYA I KROVOOBRASHCHENIYA U SOBAK PRI DEISTVII VYSOKIKH DAVLENII KISLORODA]

P. M. Gramenitskii and P. A. Sorokin *In its* Effect of the Gas Medium and Pressure on Body Functions, Collection III 1965 p 96-111 refs (See N66-17126 07-04) CFSTI: HC $6.00/MF $1.75

Experimental studies were undertaken to examine the dynamics and mechanism of respiratory and circulatory changes during oxygen poisoning. Changes in pulse, blood pressure, respiration, and pulmonary ventilation are recorded. Four periods of significant change are identified: (1) the initial period characterized by reduced pulmonary ventilation and slowing of cardiac activity; (2) the preconvulsive period expressed in hyperventilation, tachycardia, and increased arterial blood pressure; (3) the convulsive period marked by gradual slowing of the heart rate; and (4) the terminal period distinguished by a sudden replacement of parasympathetic by sympathetic reactions, with rapid rise in blood pressure and increased heart rate. Also described are procedures performed on various nerves to determine their part in the development of circulatory reactions at various stages of oxygen poisoning. Data indicate that bilateral vagotomony in the second or preconvulsive period had no appreciable effect; conversely, cutting a cardiac branch of the sympathetic nerve resulted in reduced blood pressure and decreased cardiac contractions. M.G.J.

N66-17141* Israel Program for Scientific Translations, Ltd., Jerusalem.

PATHOLOGICAL CHANGES IN THE LUNGS OF ANIMALS UNDER THE INFLUENCE OF HIGH OXYGEN PRESSURES [O PATOMOREFOLOGICHESKIKH IZMENENIYAKH V LEGKIKH U ZHIVOTNYKH PRI DEISTVII VYSOKIKH DAVLENII KISLORODA]

M. A. Groshikov and P. A. Sorokin *In its* Effect of the Gas Medium and Pressure on Body Functions, Collection III 1965 p 112-121 refs (See N66-17126 07-04) CFSTI: HC $6.00/MF $1.75

Several animal experiments were conducted to study the pathological characteristics in acute oxygen poisoning, and the mechanism of pulmonary involvement due to increased oxygen pressures. Results of autopsy and histological examination of the internal organs of guinea pigs and dogs exposed to high oxygen pressures showed similar pathological changes in both. In dogs pulmonary blood vessel congestion was more pronounced, however; and there was no eosinophilic infiltration of the alveolar septa or peribronchial tissue. Pathological changes in the lungs were identified as dilation and congestion of the veins and capillaries, sometimes with hemorrhages into the surrounding tissues and alveoli; perivascular edema; thickening of the alveolar septa; and development of different degrees and magnitudes of atelectasis. Pulmonary involvement was associated with a more or less pronounced congestion of other internal organs. It was also found that isolation of the suprarenal glands in dogs, when combined with cutting of the splanchnic nerves, was accompanied by less pronounced pathological changes in the lungs. The importance of humoral factors in the development of pulmonary involvement was emphasized. M.G.J.

N66-17142* Israel Program for Scientific Translations, Ltd., Jerusalem.

CHANGES IN THE ELECTRICAL ACTIVITY OF THE HEARTS OF ANIMALS UNDER THE INFLUENCE OF HIGH OXYGEN PRESSURE [IZMENENIYA ELEKTRICHESKOI AKTIVNOSTI SERDTSA U ZHIVOTNYKH PRI DEISTVII VYSOKIKH DAVLENII KISLORODA]

P. A. Sorokin *In its* Effect of the Gas Medium and Pressure on Body Functions, Collection III 1965 p 122-132 refs (See N66-17126 07-04) CFSTI: HC $6.00/MF $1.75

Several experiments were conducted to determine the electrical activity of the heart in intact animals, and to study the developmental dynamics of acute oxygen poisoning. Results show that a distinct reduction of the heart rate occurs at the beginning of high oxygen pressures, along with an SA block and an AV conduction disorder (in guinea pigs). The convulsive period is characterized by heart block; the terminal period, by sinus tachycardia (in dogs), which after respiratory arrest is again replaced by bradycardia and complete AV block. Data also indicated that (1) Preliminary atropinization or cutting of the vagus nerves eliminated slowing of the heart rate, SA block and AV conduction disorder in the initial and convulsive periods, but did not prevent heart block. (2) Cardiac arrhythmias and other changes in the electrical activity of the heart during the convulsive period were transitory and disappeared rather quickly when the high oxygen pressures were discontinued. M.G.J.

N66-17143* Israel Program for Scientific Translations, Ltd., Jerusalem.

CHANGE IN THE CIRCULATING BLOOD VOLUME IN DOGS BREATHING OXYGEN UNDER PRESSURES OF 1.0 AND 2.0 ATMOSPHERES [IZMENENIE KOLICHESTVA TSIRKULIRUYUSHCHEI KROVI U SOBAK PRI DYKHANII KISLORODOM POD DAVLENIEM 1.0 I 2.0 ATA]

P. A. Sorokin *In its* Effect of the Gas Medium and Pressure on Body Functions, Collection III 1965 p 133–139 refs (See N66-17126 07-04) CFSTI: HC $6.00/MF $1.75

Compression chamber experiments were conducted to investigate the factors involved in circulating blood volume, particularly under increased oxygen pressures. In control studies performed when the animals were breathing ordinary air, the volume of circulating plasma was, on the average, 47.3 ml/kg body weight; the circulating blood volume averaged 84.4 ml/kg. During the breathing of oxygen under ordinary atmospheric pressure, the quantity of circulating plasma averaged 41.8 ml/kg; circulating plasma volume averaged 75.6 ml/kg. Under an oxygen pressure of 2.0 atm, the quantity of circulating blood plasma averaged 48.1 ml/kg; the circulating blood volume, 79.7 ml/kg. From the data, it was concluded that in dogs breathing oxygen at pressures of 1 and 2 atm, a reduction of the circulating plasma and blood volume occurs; and that this reduction should be regarded as an adaptive reaction to an increased partial oxygen pressure in the inhaled air. M.G.J.

N66-17144* Israel Program for Scientific Translations, Ltd., Jerusalem.

CHANGE IN THE ADSORPTIVE PROPERTIES OF THE NERVOUS SYSTEM AND INTERNAL ORGANS OF WHITE MICE DURING OXYGEN-INDUCED CONVULSIONS [IZMENENIE SORBTSIONNYKH SVOISTV NERVNOI SISTEMYI I VNUTRENNIKH ORGANOV BELYKH MYSHEI PRI SUDOROZHNOM DEISTVII KISLORODA]

L. I. Aruin and M. G. Ryff *In its* Effect of the Gas Medium and Pressure on Body Functions, Collection III 1965 p 140–147 refs (See N66-17126 07-04) CFSTI: HC $6.00/MF $1.75

Pressure chamber experiments are described in which intravital staining of both isolated organs and the intact organism was used to demonstrate the occurrence of fine material changes in the central nervous system and some internal organs due to increased oxygen pressure. Tests were conducted to study the absorptive power of the tissues under the toxic influence of oxygen in the preconvulsive period; the adsorptive power of animal organs after suffering convulsive paroxysms at a pressure of 4.2 atm; and the stainability of organs in the postconvulsive phase. It was found that a phasic change occurred in intravital stainability of the central nervous system and suprarenal glands. A quantitative evaluation of these changes showed that in the preconvulsive period, the absorptive power of the brain is reduced; during the convulsions such power increases considerably; and in the postconvulsive period a reduction re-occurs: the cerebral cortex showed the greatest changes. Data on the adsorptive properties of the suprarenal gland indicate that the development of oxygen poisoning is accompanied by distinct changes in dye absorption at various phases of the toxic effect of oxygen. M.G.J.

N66-17145* Israel Program for Scientific Translations, Ltd., Jerusalem.

EXPERIENCE IN THE COMPREHENSIVE STUDY OF THE CONDITION OF SOME SYSTEMS OF THE HUMAN BODY UNDER INCREASED OXYGEN PRESSURE [OPYT KOMPLEKSNOGO IZUCHENIYA SOSTOYANIYA NEKOTORYKH SISTEM ORGANIZMA CHELOVEKA V USLOVIYAKH POVYSHENNOGO DAVLENIYA KISLORODA]

G. L. Zal'tsman, I. D. Zinov'eva, S. D. Kumanichkin, and A. V. Turygina *In its* Effect of the Gas Medium and Pressure on Body Functions, Collection III 1965 p 148–155 refs (See N66-17126 07-04) CFSTI: HC $6.00/MF $1.75

Dry compression chamber experiments were conducted on three divers to study the functions of the motor, cardiovascular, respiratory, and central nervous systems, under the initial toxic effect of oxygen. Procedures included electroencephalographic tracings; recording of heart and respiratory rates, and blood pressure; higher nervous activity tests; and electromyographic recordings. Studies were initially made in a chamber under ordinary conditions, while breathing air, and then every half-hour while under pressure. Each subject was exposed twice to the effect of increased oxygen pressure. The clinical manifestations of the toxic effect of oxygen indicated disorders of the autonomic nervous system functions; these occurred after approximately 1-1/2 to 2 hours of exposure. It was pointed out that a number of latent changes were detected as early as the first few minutes under increased oxygen pressure; the greatest changes were found in the visual and auditory analyzers, but the complex behavioral reactions were retained. M.G.J.

N66-17146* Israel Program for Scientific Translations, Ltd., Jerusalem.

METHOD OF DETERMINING THE HEMODYNAMIC INDICES IN LONG-TERM EXPERIMENTS ON DOGS UNDER A HIGH PARTIAL PRESSURE OF OXYGEN (IN A PRESSURE CHAMBER) [K METODIKE OPREDELENIYA GEMODINAMICHESKIKH POKAZATELEI V KHRONICHESKIKH OPYTAKH NA SOBAKAKH PRI VYSOKOM PARTSHAL'NOM DAVLENII KISLORODA (V BAROKAMERE)]

N. Ya. Sidorov *In its* Effect of the Gas Medium and Pressure on Body Functions, Collection III 1965 p 156–163 refs (See N66-17126 07-04) CFSTI: HC $6.00/MF $1.75

Experimental methods for determining hemodynamic changes in dogs subjected to high pressure conditions for long periods of time are described. The general procedure used for recording the processes of the cardiovascular system is outlined. Diastolic and lateral systolic blood pressure; the rate of pulse wave propagation (as an index of the tone in the large artery); and the pulse and respiratory rates (by electrocardiogram) were recorded. A tacho-oscillographic method and a carbon contact pick-up method for recording the blood pressure are described. On the basis of data obtained, the derivatives of the hemodynamic indices of stroke volume, minute volume, and peripheral resistance can be calculated. L.S.

N66-17147* Israel Program for Scientific Translationsy Ltd., Jerusalem.

THE BLOOD AND SPINAL FLUID SUGAR, LACTIC ACID, AND INORGANIC PHOSPHORUS IN DOGS WITH HYPEROXEMIC AND HYPOXEMIC CONVULSIONS [SODERZHANIE SAKHARA, MOLOCHNOI KISLOTY I NEORGANICHESKOGO FOSFORA V KROVI I SPINNOMOZGOVOI ZHIDKOSTI U SOBAK PRI GIPERO- I GIPOKSEMICHESKIKH SUDOROGAKH]

A. F Panin *In its* Effect of the Gas Medium and Pressure on Body Functions, Collection III 1965 p 164–169 refs (See N66-17126 07-04) CFSTI: HC $6.00/MF $1.75

The effect of hyperoxemic and hypoxemic convulsions on the sugar, lactic acid, and inorganic phosphorus contents of the blood and spinal fluid of dogs was investigated. The convulsions were studied in increased and reduced atmospheric pressure chambers. The data are presented in tabular form, and indicate that both hyperoxemic and hypoxemic convulsions are characterized by a considerable increase in the blood lactic acid. In the former case the increase is brought about by

interference with tissue oxygen utilization; in the latter case, by reduction of the oxygen tension in the tissues. The blood sugar content of the dogs with both types of convulsions is markedly increased. The blood inorganic phosphorus in dogs with hyperoxemic convulsions is distinctly elevated; but in hypoxemic conditions the phosphorus level remains unchanged or is somewhat reduced. L.S.

N66-17148* Israel Program for Scientific Translations, Ltd., Jerusalem.

THE TYPOLOGY OF HIGHER NERVOUS ACTIVITY CHARACTERISTICS IN DOGS UNDER BAROMETRIC PRESSURE CHANGES [TIPOLOGICHESKIE OSOBENNOSTI VYSSHEI NERVNOI DEYATEL'NOSTI SOBAK PRI IZMENENII BAROMETRICHESKOGO DAVLENIYA]

V. N. Zvorykin *In its* Effect of the Gas Medium and Pressure on Body Functions, Collection III 1965 p 170–177 refs (See N66-17126 07–04) CFSTI: HC $6.00/MF $1.75

The nature and degree of changes in higher nervous activity of dogs under the influence of rarefied air and anoxia were studied by means of experiments performed in a high pressure chamber with rarefied air. The investigation was made by using the conditioned salivary reflexes of the dogs to food, and other positive conditioned stimuli reflexes. Tests were performed involving starvation, caffeine, bromine, powerful stimuli effects, extension of the positive conditioned reflex, prolongation of the action of the differentiating stimulus, change in the biological significances of the positive and inhibitory conditioned stimuli, and a check on the dynamic stereotype with an indicator stimulus. The experimental data are discussed. They indicate that there is a definite relationship between the nature and degree of changes in nervous activity in dogs under air rarefraction, and the basic characteristics of their nervous processes. The type of nervous activity affects the changes, along with other factors which are also analyzed. L.S.

N66-17149* Israel Program for Scientific Translations, Ltd., Jerusalem.

THE EFFECT ON HIGHER NERVOUS ACTIVITY OF DOGS OF ACUTE HYPOXEMIA PRODUCED BY RAREFACTION OF THE ATMOSPHERE TO AN ALTITUDE OF 18,000 METERS [VLIYANIE OSTROI GIPOKSEMII, VYZVANNOI RAZREZHENIEM ATMOSFERY DO VYSOTY 18,000 M, NA VYSSHUYU SOBAK]

B. A. Vinokurov and Zan Dok Men *In its* Effect of the Gas Medium and Pressure on Body Functions, Collection III 1965 p 178–195 refs (See N66-17126 07–04) CFSTI: HC $6.00/MF $1.75

Dogs were subjected to conditions of atmospheric rarefaction corresponding to an altitude of 18 000 m for determining the effect of acute hypoxemia on their nervous activity. Various experimental situations were conducted, and the behavior of the dogs reactions to petting, danger, painful, audio, and photic stimuli were observed. Motion picture frames showing the dogs responding to the stimuli are shown. The observations tend to advance the idea that the stability of conditioned reflexes in the presence of strong external factors is determined by their biological significance for the organ experiencing the unusual effects. Under ordinary feeding conditions, the ascents up to 18 000 m in the pressure chamber, leading to the development of marked hypoxemia, are accompanied by the rapid formation of motor defense conditioned-reflex reactions to the situation and complete inhibition of the natural reflexes to food. After 1 to 2 months of being only in the pressure chamber, the animals maintain positive reactions to the experimental situation and to food stimuli, despite subsequent repeated ascents in the chamber to the same altitude, accompanied every time by a very severe anoxia. L.S.

N66-17150* Israel Program for Scientific Translations, Ltd., Jeri salem.

THE DEVELOPMENT OF DINITROPHENOL-INDUCED HYPERTHERMIA UNDER ALTERED PARTIAL PRESSURES OF OXYGEN AND CARBON DIOXIDE [RAZVITIE DINITROFENOLOVOI GIPERTERMII PRI IZMENENNYKH PARTSIAL'NYKH DAVLENIYAKH KISLORODA I UGLEKISLOTY]

A. A. Savich *In its* Effect of the Gas Medium and Pressure on Body Functions, Collection III 1965 p 196–204 refs (See N66-17126 07-04) CFSTI: HC $6.00/MF $1.75

Dinitrophenol, DNP, solutions were injected into the auricular veins of both male and female rabbits for the purpose of inducing hyperthermia in the animals. The rabbits were then placed in a vacuum chamber and raised to a simulated height of 5,500 m where they were kept for 1 hr to determine the influence of reduced partial oxygen pressure on the animals. A total of 77 experiments on 63 rabbits were performed in which the pressures of oxygen and carbon dioxide were varied. Control experiments were included. The data indicate that the change in partial oxygen pressure exerts a very pronounced effect on the development of DNP-induced hyperthermia. The experiments also showed that after DNP administration, the rabbits have an altered tolerance to the effect of altered partial oxygen and carbon dioxide pressures. Under an atmosphere of compressed oxygen, a very marked acceleration in the course of the hyperthermic reaction of the DNP injection occurs. Other observations are noted; and tables of the data obtained are given. L.S.

N66-17151* Israel Program for Scientific Translations, Ltd., Jerusalem.

THE EFFECT ON THE BODY OF A PROLONGED STAY IN A GAS MEDIUM WITH AN INCREASED CARBON DIOXIDE CONTENT [VLIYANIE NA ORGANIZM DLITEL'NOGO PREBYVANIYA V GAZOVOI SREDE S POVYSHENNYM SODERZHANIEM UGLEKISLOTY]

T. N. Zheludkova, V. P. Zagryadskii, and Z. K. Sulimo-Samuillo *In its* Effect of the Gas Medium and Pressure on Body Functions, Collection III 1965 p 205–211 refs (See N66-17126 07–04) CFSTI: HC $6.00/MF $1.75

Experiments were performed on 42 rabbits in a gas pressure chamber to study the effect of air mixtures containing increased carbon dioxide content on the breathing of the animal organism. Electroencephalographic and electrocardiographic recordings were made. The data indicate that after the animals had been in gaseous mediums with 3% or 5% carbon dioxide content, pronounced functional changes were observed in respiration, the cardiovascular system, and the central nervous system, agreeing with data from the literature. A rapid switch of animals from a medium with an increased carbon content to ordinary atmospheric air left marked aftereffects on the animals lasting 1.5 to 2 hrs. The aftereffect period is considerably reduced (to 30 min) and is accompanied by less pronounced functional changes when the 5% carbon dioxide content is mixed with 35% to 40% oxygen. Other observations are also noted, and discussed. L.S.

N66-17152* Israel Program for Scientific Translations, Ltd., Jerusalem.

ADAPTIVE REACTION OF THE HUMAN BODY TO THE REPEATED EFFECTS OF INCREASED AIR PRESSURE (ACCORDING TO DATA ON THE STUDY OF HIGHER NERVOUS ACTIVITY) [PRISPOSOBITEL'NAYA REAKTSIYA ORGANIZMA CHELOVEKA K POVTORNOMU DEISTVIYU POVYSHENNYKH DAVLENII VOZOUSHNOI SREDY (PO DANNYM IZUCHENIYA VYSSHEI NERVNOI DEYATEL'NOSTI)]

B. A. Nessirio *In its* Effect of the Gas Medium and Pressure on Body Functions, Collection III 1965 p 212–219 refs (See N66-17126 07-04) CFSTI: HC $6.00/MF $1.75

A study was made of the dynamics of higher nervous activity indices of subjects, aged between 19 and 30, repeatedly exposed to conditions of increased air pressures (4 atm to 8 atm) in a dry pressure chamber for evaluating their body adaptive reactions. The data are given in tabular form and are discussed. Relative normalization of the indices occurs in the majority of cases after 3 to 5 descents. The nature of the reactions depended on the degree of disorder of the nervous activity under pressure. The greater the pressure, the more sensitive the subject to the anaesthetic effect of nitrogen; and the more difficult the task, the more pronounced were the changes in higher nervous activity and the greater were the number of repeated descents necessary for relative normalization of them. Training sessions against the initial anaesthetic effect of nitrogen in divers permit an increase in the output of their work under increased pressure. L.S.

N66-17153* Israel Program for Scientific Translations, Ltd., Jerusalem.

THE PROBLEM OF THE MECHANISM OF OCCURRENCE OF PULMONARY PRESSURE TRAUMA DURING THE BREATHING OF AIR AND OXYGEN [K VOPROSU O MEKHANIZME VOZNIKNOUENIYA BAROTRAVMY LEGKIKH PRI DYKHANII VOZDUKHOM I KISLORODOM]

Yu. M. Polumiskov *In its* Effect of the Gas Medium and Pressure on Body Functions, Collection III 1965 p 220–227 refs (See N66-17126 07-04) CFSTI: HC $6.00/MF $1.75

Experiments were performed on cats and dogs of both sexes for studying the mechanism of the occurrence of pulmonary pressure trauma during their breathing. Blood pressure, respiration, intrapleural pressure, intra-pulmonary pressure and time marking were recorded on a kymograph. The results of the experiments are tabulated and discussed. The data indicate that pneumothorax always occurs in dogs and cats when the intrapulmonary pressure is increased from 10 mm to 60 mm Hg, most often between 20 mm and 40 mm Hg. Increase in the duration of action of intrapulmonary pressure causes pressure trauma of the lungs at lower pressures. In some cases, visible arterial gas embolism occurs during the trauma when the pressure is raised above 60 mm Hg and is accompanied by the simultaneous entrance of a large number of gas bubbles into the left heart and the arteries of the entire body of the animal. The nature of the gas mixture breathed is of no essential importance in the occurrence mechanism of pulmonary pressure trauma or accompanying arterial gas embolism. L.S.

N66-17154* Israel Program for Scientific Translations, Ltd., Lerusalem.

THE PROBLEM OF THE EFFECT OF BREATHING OXYGEN IN THE RESORPTION OF GAS EMBOLI IN THE VASCULAR SYSTEM OF AN ANIMAL AND ON THE COURSE OF PULMONARY PRESSURE TRAUMA [K VOPROSU O VLIYANII DYKHANIYA KISLORODOM NA RASSASYVAEMOST' GAZOVYKH EMBOLOV V KROVENOSNOI SISTEME ZHIVOTNOGO I TECHENIE BAROTRAVMY LEGKIKH]

Yu. M. Polumiskov *In its* Effect of the Gas Medium and Pressure on Body Functions, Collection III 1965 p 228–233 refs (See N66-17126 07-04) CFSTI: HC $6.00/MF $1.75

Seventeen experiments were performed on cats to determine the effect of breathing oxygen on resorption of gas bubbles in the blood vessels with pulmonary pressure trauma. The experiments were conducted in three groups: in one group, the animals were switched to breathing oxygen 30 to 50 min before beginning the increase in intrapulmonary pressure; in another group pulmonary pressure trauma with arterial gas embolism was produced with air; and for the remaining experiments pulmonary pressure trauma was produced with air alone. The results show that resorption of the gas bubbles occurs more rapidly in animals breathing oxygen than in those breathing air. The change in the number of gas bubbles in the cannula trap essentially corresponded to the nature of changes in gas emboli in the animal's blood vessels. The experiments performed with creation of pulmonary pressure trauma and arterial gas embolism permitted a determination of the effect of the nature of the gas mixture being breathed on the course of the disorder. C.T.C.

N66-17155* Israel Program for Scientific Translations, Ltd., Jerusalem.

THE PROBLEM OF TREATMENT OF PULMONARY PRESSURE TRAUMA [K VOPROSU O LECHENII BAROTRAVMY LEGKIKH]

Yu. M. Polumiskov *In its* Effect of the Gas Medium and Pressure on Body Functions, Collection III 1965 p 234–238 refs (See N66-17126 07-04) CFSTI: HC $6.00/MF $1.75

Because therapeutic recompression is often impossible or too delayed in treating pulmonary pressure trauma, a method to alleviate this condition before recompression was studied. Experiments were performed on cats of both sexes to study the effect of active removal of excess gas from the intrapleural space into which the gas entered through rupture of the lung tissue. The gas was sucked out with a syringe through the side arm of a rubber tube connected into the system for recording the intrapleural pressure. Positive results were obtained with the method and they are explained by the fact that with the occurrence of pulmonary pressure trauma, the gas enters the pleural cavities, mediastinal tissue, tissue of the retroperitoneal space, and other organs. By suction, the gas is removed from the interpleural spaces of both lungs, and probably a certain quantity from the mediastinal tissue. The suction evidently creates a negative pressure in the interpleural cavity. The ruptured part of the lung is appressed against the parietal pleura and subsequently the lung can function again under near normal conditions. Removing the excess gas not only eliminates the mechanical impediment to cardiovascular activity, but also reduces the strength of internal organ receptor stimulations, which also has a positive effect. R.N.A.

N66-17156* Israel Program for Scientific Translations, Ltd., Jerusalem.

THE ROLE OF PROPRIOCEPTIVE IMPULSES FROM THE CHEST AND ABDOMINAL MUSCLES IN THE REACTIONS OF THE BODY DURING RESPIRATION UNDER INCREASED INTRAPULMONARY PRESSURE [ROL' IMPUL'SOV S PROPRIORETSEPTOROV GRUDNOI KLETKI I MYSHTS ZHIVOTA V REAKTSIYAKH ORGANIZMA PRI DYKHANII POD POVYSHENNYM DAVLENIEM V LEGKIKH]

P. V. Oblapenko *In its* Effect of the Gas Medium and Pressure on Body Functions, Collection III 1965 p 239–248 refs (See N66-17126 07-04) CFSTI: HC $6.00/MF $1.75

The role of increased proprioceptive impulses from the chest and abdominal muscles in regulating respiration and circulation with increased intrapulmonary pressure was studied. The study showed that during respiration under increased intrapulmonary pressure, the exclusion of propricoceptive impulses by severing the posterior columns of the spinal cord of dogs causes tone and contraction reduction of respiratory muscles. The reduced tone of respiratory muscles and their asynchronous activity after supplementary vagotomy is markedly expressed. The sharp reduction of abdominal muscle tone observed after severing the spinal cord posterior columns and supplementary vagotomy, causes a decrease in the blood pressure level. During respiration under increased intrapulmonary pressure, recovery from the initial hemodynamic disorders is slow or does not occur, and the pressure in the right ventricle increases significantly. During respiration under increased intrapulmonary pressure in which proprioceptive

impulses were cut, a supplementary high or low vagotomy causes the same circulatory disorders. This indicates that the basic factor causing these disorders is the decrease of blood flow to the right ventricle due to the sharp reduction of abdominal muscle tone, and the exclusion of the sucking effect of the thorax during inspiration. R.N.A.

N66-17157* Israel Program for Scientific Translations, Ltd., Jerusalem.

THE CONDITION OF VASCULAR REFLEXES IN DOGS DURING RESPIRATION UNDER INCREASED INTRAPULMONARY PRESSURE [SOSTOYANIE SOSUDISTYKH REFLEKSOV U SOBAK PRI DYKHANII POD POVYSHENNYM DAVLENIEM V LEGKIKH]

P. V. Oblapenko *In its* Effect of the Gas Medium and Pressure on Body Functions, Collection III 1965 p 249–257 refs (See N66-17126 07-04) CFSTI: HC $6.00/MF $1.75

The nature of changes in the carotid sinus pressor and depressor reflexes in dogs during respiration under increased intrapulmonary pressure was investigated along with their effect on the body's adaptive reactions under these conditions. The study showed that during breathing under increased intrapulmonary pressure, the carotid sinus pressor and depressor reflexes in dogs decrease. The depressor reflex is more variable. The degree of reflex reduction depends on the blood pressure level in the greater circulation, which is determined by the tone of the vasoconstrictor center. With a low blood pressure, as well as after atropinization of animals or vagotomy, the pressor carotid sinus reflex is minimal and the depressor effect may disappear completely or even be distorted. During the blood pressure reduction in the greater circulation, there is an irradiation of excitation from the vasomotor to the respiratory center, which is in an inhibited state. This contributes to a more rapid recovery of respiration in the initial period after an increase of intrapulmonary pressure. R.N.A.

N66-17158* Israel Program for Scientific Translations, Ltd. Jerusalem.

THE ROLE OF THE VAGUS NERVES IN THE BODY REACTIONS DURING BREATHING UNDER INCREASED INTRAPULMONARY PRESSURE [O ROLI BLUZHDAYUSHCHIKH NERVOV V REAKTSIYAKH ORGANIZMA PRI DYKHANII POD POVYSHENNYM DAVLENIEM V LEGKIKH]

P. V. Oblapenko *In its* Effect of the Gas Medium and Pressure on Body Functions, Collection III 1965 p 259–267 refs (See N66-17126 07-04) CFSTI: HC $6.00/MF $1.75

A detailed study was made of the role of the vagus nerves in the circulatory and respiratory reactions during increased intrapulmonary pressure. Under increased intrapulmonary pressure, dogs showed respiratory inhibition and a reduced heart rate, contributing to a drop in blood pressure in the greater circulation due to afferent vagus nerve, impulses coming from the mechanoreceptors of the lungs and other thoracic organs. The blood pressure stability which occurs is effected by a number of reflexes. The vagus nerves constitute the afferent component of the reflex arc in this process. The parasympathetic fibers coming to the heart through the vagus nerves inhibit the cardiac contraction rates, increase the duration of diastole, and reduce cardiac fatigue during respiration under increased pressure. Low vagotomy results in a reduction of abdominal muscle tone, a deterioration of venous inflow into the right ventricle, and a slower compensation for the hemodynamic changes caused by increased intrapulmonary pressure. High vagotomy, which causes a disruption of the reflex regulation of cardiac activity, produces an impoverishment of the animals tolerance to breathing under increased pressure. R.N.A.

N66-17159* Israel Program for Scientific Translations, Ltd., Jerusalem.

RESPIRATORY AND CARDIOVASCULAR REFLEXES FROM GASTROINTESTINAL MECHANORECEPTORS IN BAROMETRIC PRESSURE CHANGES [REFLEKSY S MEKHANORETSEPTOROV ZHELUDOCHNOKISHECHNOGO TRAKTA NA DYKHANIE I SERDECHNOSOSUDISTUYU SISTEMU PRI PEREPADAKH BAROMETRICHESKOGO DAVLENIYA]

V. N. Zvorykin, A. A. Koreshkov, and P. A. Mal'kov *In its* Effect of the Gas Medium and Pressure on Body Functions, Collection III 1965 p 268–278 refs (See N66-17126 07-04) CFSTI: HC $6.00/MF $1.75

An investigation was conducted on respiratory and cardiovascular reflexes from gastrointestinal mechanoreceptors resulting from expanding gas in the gastrointestinal tract during barometric pressure changes. An increase in the gastrointestinal tract gas volume along with a decrease in barometric pressiure causes a change in the frequency and depth of respiration, in the volume of pulmonary ventilation, in pulse rate, and in the strength of cardiac contraction and blood pressure. The degree and nature of these changes depend on the pressure on the gastrointestinal wall. Respiratory and circulatory changes occurring from expanding gas in the gastrointestinal tract during a barometric drop depend on the mechanism of visceral reflexes from the mechanoreceptors of the stomach and intestines, and on the mechanical effects on the diaphragm, position of the heart, and the lumina of abdominal vessels. The vagus and splanchnic nerves and nerve plexuses of the abdominal cavity are involved in these reflexes. R.N.A.

N66-17160* Israel Program for Scientific Translations, Ltd., Jerusalem.

CASE OF LATE MANIFESTATION OF INTRAPULMONARY PRESSURE [SLUCHAI POZDNEGO PROYAVLENIYA BAROTRAVMY LEGKIKH]

N. A. Afanas'ev and Z. S. Gusinskii *In its* Effect of the Gas Medium and Pressure on Body Functions, Collection III 1965 p 279–281 (See N66-17126 07-04) CFSTI: HC $6.00/MF $1.75

A latent case of intrapulmonary pressure trauma with gas embolism, its symptoms, its diagnosis, and its treatment are described. After surfacing too quickly, a diver suffered no ill effects for 16 to 18 hours. Then, he began to complain of chest pains on deep inspiration and muscular pains in his arms and chest. During the next three days he developed headache, dizziness, weakness, dyspnea, and palpitations. A survey chest X-ray showed indistinct shadows of a gas layer in the supraclavicular areas, although temperature, blood pressure and pulse were normal. Finally, 92 hours after surfacing the diver was placed in a recompression chamber, from which he emerged several hours later complaining only of weakness and slight chest pains. After being held several days for observation, he was released in good condition. Based on these and other detailed observations, practical recommendations are made for prevention and treatment of future cases. D.T.

N66-17161* Israel Program for Scientific Translations, Ltd., Jerusalem.

SEVERE SPINAL FORM OF DECOMPRESSION SICKNESS WITH A FAVORABLE OUTCOME [TYAZHELAYA SPINAL'NAYA FORMA DEKOMPRESSIONOI BOLEZNI S BLAGOPRIYATNYM ISKHODOM]

Z. S. Gusinskii and A. I. Shvarev *In its* Effect of the Gas Medium and Pressure on Body Functions, Collection III 1965 p 282–286 (See N66-17126 07-04) CFSTI: HC $6.00/MF $1.75

A case of severe spinal cord lesions in decompression sickness, its symptoms, its diagnosis, and its treatment are described. The sickness began following a training session

in a recompression chamber. At first the diver complained of neck pains and formication in the lower regions; he next noted chest pains, and weakness and reduced sensitivity in the lower half of his body. After being replaced in the recompression chamber, his condition worsened; and he was finally removed to a hospital suffering paralysis in the lower extremities. During his several months of recovery, the diver was treated for a number of complications, including infections and allergic reactions. Varied drugs were administered, i.e., antibiotics, nystatin, vitamins, aloe, protigmine, and dibazole. After prolonged treatment, he was discharged still suffering mild residual signs of paraparesis and reduced sensitivity in his legs. It is finally noted that the patient was predisposed to allergic reactions from various causes; and it is recommended that physicians consider this possibility in selection of diving candidates. D.T.

N66-17162* Israel Program for Scientific Translations, Ltd., Jerusalem.

INCREASED INDIVIDUAL PREDISPOSITION OF A SUBJECT TO THE EFFECT OF HIGH PARTIAL OXYGEN PRESSURE [O POVYSHENNOI INDIVIDUAL'NOI PREDRASPOLOZHENNOSTI ISPYTUEMOGO K OEISTVIYU VYSOKIKH PARTSIAL'NYKH DAVLENII KISLORODA]

G. L. Zal'tsman, I. D. Zinov'eva, and S. D. Kumanichkin *In its* Effect of the Gas Medium and Pressure on Body Functions, Collection III 1965 p 287–290 refs (See N66-17126 07–04) CFSTI: HC $6.00/MF $1.75

The toxic effects of high partial oxygen pressure on vision, and a means of preventing these effects are discussed. During a long term recompression test, a diver complained of cloudy vision. After emerging from the chamber, he was found to be suffering a severe restriction of the peripheral visual field. Complete recovery took 40 minutes. Animal studies, however, had already shown that oxygen's toxic effects could be lessened during recompression by occasionally breathing air instead of pure oxygen. Therefore following this routine, the diver was again subjected to an even longer recompression period. The symptoms, however, were considerably reduced in severity. Appropriate recommendations are made. D.T.

N66-17175# Brookhaven National Lab., Upton, N. Y. Biology Dept.

GALVANI, VOLTA AND BIOELECTRICITY

Leslie F. Nims [1965] 35 p refs Alexander Forbes Lecture, Marine Biol. Lab., Woods Hole, Mass., 9 Jul. 1965
(Contract AT(30-2)-GEN-16)
(BNL-9337) CFSTI: HC $2.00/MF $0.50

Developments in the field of bioelectricity since the studies of Galvani in 1794 are reviewed, with emphasis on the development of the voltaic pile, or galvanic cell, by Volta, and the formulation of the concept of a hypothetical difference in electrical potential across a membrane. It is stressed that in theoretical electrophysiology, account must be taken of the fact that equilibrium between phases separated by a membrane is the exception rather than the rule in biological systems; that a fundamental observation of bioelectricity is that electric currents flow; that the electric currents of interest are quasi-direct, or steady state currents in closed electrical circuits; and that there are no metallic electrodes or electrochemical reactions. Equations are presented that illustrate the thermodynamics of irreversible processes for material transfer across a membrane of constant thickness in which there is a difference in the chemical potential of neutral molecules or a difference in electrochemical potential of an ion between two homogeneous phases in contact with the barrier. A unit transfer system in a Sollner ring system is cited as an example, in which the system is regarded as two unit transfer systems containing barriers of different properties arranged in an electrical circuit. Applications of the theories discussed to the thermodynamics of material transfer across biological membranes are developed. NSA

N66-17176# Brookhaven National Lab., Upton, N. Y. Biology Dept.

MATERIAL TRANSFER, MEMBRANES AND METABOLISM

Leslie F. Nims [1965] 56 p refs Alexander Forbes Lecture, Marine Biol. Lab., Woods Hole, Mass., 8 Jul. 1965
(Contract AT(30-2)-GEN-16)
(BNL-9338) CFSTI: HC $3.00/MF $0.50

Thermodynamic principles involved in the transfer of ions across membranes are discussed on the basis of their applicability in studies of the flow of nutrients and excrements into and out of a biological system. It is pointed out that all living systems operate as open systems for the major fraction of their life span. The point is stressed that the motion of material substances through biological barriers appears to obey the same basic laws as the motion of proteins in a centrifuge, the sedimentation of cells in a test tube, or the motion of satellites in the atmospheric barrier. Theories of material transfer are developed by means of mathematical relations that apply physical-chemical concepts to biological processes. The details of the molecular traffic occurring in all biological barriers will be of interest to the experimentalist in that they lead to formal relations between metabolism and ion distribution patterns verifiable by experiment, and in some instances a quantitative prediction of the behavior of particular membranes. Applications of the theories in explaining the results of radioisotope tracer studies of membrane transfer are discussed briefly. NSA

N66-17218*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.

THE ANOMERIC SPECIFICITY OF YEAST GALACTOKINASE

Sally M. Howard and M. R. Heinrich (Southern Calif. Univ.) [1964] 25 p refs
(Grant PHS G-A-5096)
(NASA-TM-X-56057) CFSTI: HC $1.00/MF $0.50 CSCL 06A

In order to investigate the specificity of yeast galactokinase toward the α and β anomers of galactose, a chromatographic system has been developed for separating the identifying α- and β-galactose-1-phosphates. The purified enzyme was incubated with β-galactose, and the phosphorylated product isolated and identified as α-Gal-1-P. Optical rotation studies show no mutarotase activity in the enzyme preparation; however, other components of the incubation mixture are shown to accelerate the mutarotation of β-galactose. Thus, while it cannot be stated conclusively that β-galactose cannot be phosphorylated by this enzyme, the absence of any β-Gal-1-P in the product confirms that α-galactose is the preferred substrate, and that the previously observed reaction of purified galactokinase with β-galactose probably consists of nonenzymatic mutarotation, followed by phosphorylation of the resulting α-galactose. Author

N66-17221*# National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.

SPACE VEHICLE WATER RECLAMATION SYSTEMS

Dan C. Popma and Vernon G. Collins [1965] 35 p refs Presented at the AIChE 55th Natl. Meeting on Aerospace Life Support Systems, Houston, Tex., 7–11 Feb. 1965
(NASA-TM-X-56123) CFSTI HC $2.00/MF $0.50 CSCL 06K

The necessity and potential sources for water reclamation are discussed and water reclamation system concepts of multifiltration, compression distillation, air evaporation, electrodialysis, and reverse osmosis are reviewed. The reverse osmosis system, utilizing the electrolysis pretreatment, has

the advantages of low weight, size, and power requirements. Also, operation is at ambient temperature; byproducts are nontoxic and utilizable; sterilization is inherent in the system; and no expendables are required. Advantages and disadvantages of the other systems are included. E.E.B.

N66-17240*# National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
MICROBIAL CONTAMINATION OF A SURFACE BY HANDLING
Edmund M. Powers Nov. 1965 12 p refs
(NASA-TM-X-55408; X-624-65-491) CFSTI: HC $1.00/MF $0.50 CSCL 06M

Stainless steel strips were used to determine the extent of microbial surface contamination due to handling. After sterilization, the strips were handled by various persons with freshly washed hands for different lengths of time in an attempt to discern what, if any, parameters were effective in contamination. It was noted that strips handled by persons who perspired heavily contained a microbe count several times greater than strips handled by persons who did not tend to perspire. Other parameters, for which no conclusions were reached, included age, sex, weight, state of nutrition, type of diet, and pathological condition. D.T.

N66-17271*# Naval School of Aviation Medicine, Penacola, Fla. Aerospace Medical Inst.
MODIFICATION OF VESTIBULAR SENSITIVITY IN THE RAT
David C. Riccio, Makoto Igarashi, and Arnold Eskin 17 Nov. 1965 21 p refs *Its* Rept.-125
(NASA Order R-93)
(NASA-CR-70394; NAMI-950) CFSTI: HC $1.00/MF $0.50 CSCL 06C

Spontaneous locomotor activity was measured in 21 unrestrained rats individually exposed to rotation. In accordance with previous findings, normal control rats showed a marked decrement in activity during rotation. In contrast, animals with unilateral destruction of the labyrinth through intratympanic injection of streptomycin sulfate were only moderately affected by rotation, as indicated by their continued high levels of activity. Rats with intact labyrinths but previous rotation exposure also showed decreased sensitivity to rotation, indicating that either physiological insult or experience (habituation) can produce similar modifications in the response to rotation. Rats were extremely resistant to streptomycin sulfate injected systemically; neither morphological damage to the hair cells of the vestibule nor changes in the behavioral response to rotation was found following a total drug dosage of 10,000 mg. Author

N66-17272*# Naval School of Aviation Medicine, Pensacola, Fla. Aerospace Medical Inst.
ARCHITECTURE OF THE OTOLITH END ORGAN: WITH SOME FUNCTIONAL CONSIDERATIONS
Makoto Igarashi 8 Dec. 1965 19 p refs *Its* Rept.-127
(NASA Order R-93)
(NASA-CR-70393; NAMI-952) CFSTI: HC $1.00/MF $0.50 CSCL 06C

The otolithic membrane is extremely fragile and is easily destroyed by post-mortem changes, tonic change, strong chemicals, etc. The routine technique of temporal bone preparation usually includes the use of a strong fixative and decalcifier; therefore, the structural preservation of this structure in histological slides is uncertain. An attempt was made to preserve the otolithic architecture as naturally as possible. In studying squirrel monkey temporal bones the results obtained with three different decalcifiers are compared. The best architectural preservation of the otolithic end organ was obtained after 10% formalin fixation, dehydration, celloidin embedding and 10% EDTA decalcification. The morphological features of this end organ are discussed from the functional viewpoint. It is confirmed that, except for the otoconia, basically both otolith and semicircular canal end organs have almost similar components. Author

N66-17273*# Miami Univ., Coral Gables, Fla. Institute of Molecular Evolution.
[INVESTIGATIONS IN SPACE-RELATED BIOLOGY] Semiannual Status Report, 1 Jun.-1 Dec. 1965
[1965] 11 p refs
(Grant NsG-689)
(NASA-CR-70384) CFSTI: HC $1.00/MF $0.50 CSCL 06A

In the study of molecular evolution, the properties of thermal poly-α-amino acids and thermal polynucleotides have been investigated, along with the behavior of microscopic units which organize spontaneously when amino acid condensates are brought in contact with water. In addition, the catalytic activity of the proteinoids has been investigated in the hydrolysis of ATP, ADP, and AMP, and in the decarboxylation of pyruvic acid. It is pointed out that, although the protenoid activity is much weaker than that of contemporary enzymes, this is an effect which is conceptually susceptible to evolutionary enrichment. Further, the assembled results lead to the inference that protenoids, like proteins, have many activities because of their chemical polyfunctionality. D.T.

N66-17297# Federal Aviation Agency, Oklahoma City, Okla. Office of Aviation Medicine.
THE ANGLE OF SHOULDER SLOPE IN NORMAL MALES AS A FACTOR IN SHOULDER HARNESS DESIGN
Clyde C. Snow and A. Howard Hasbrook Mar. 1965 8 p refs
(AM-65-14)

In order to establish criteria for more comfortable shoulder-harness design, this study was conducted to determine the angle of slope of the top of the shoulders where poorly fitting shoulder harness may produce discomfort and, occasionally, functional impairment through compression of the underlying soft tissues. The mean shoulder-slope angle (measured from the vertical body axis) of normal males based on this study of 55 Air Traffic Service trainees is 67.5° with a standard deviation of 5.0°. Author

N66-17386# Chrysler Corp., New Orleans, La. Space Div.
A COLLECTION OF PAPERS ON SPACESUITS AND HUMAN PERFORMANCE
Norman M. Molesko, ed. 16 Aug. 1965 153 p refs
(REL-HFG-65-1)

CONTENTS:

1. LUNAR SURFACE AND FREE SPACE HAZARDS RELATING TO SPACE SUIT DESIGN J. R. Goodman and M. I. Radnofsky (NASA. Manned Spacecraft Center) 25 p
(See N66-17387 08-05)

2. ZERO-G STUDIES AND PRESSURE SUITS E. H. Sasaki (Aerospace Med. Div. Aerospace Med. Res. Labs.) 6 p (See N66-17388 08-05)

3. PRELIMINARY INVESTIGATIONS OF SPACE MAINTENANCE J. S. Seeman and F. H. Smith (NASA. Marshall Space Flight Center), and D. D. Mueller (AF Acad.) 23 p ref (See N66-17389 08-05)

4. THE USE OF SPACE SUITS IN WATER IMMERSION STUDIES B. F. Pierce, R. L. Wolf, and E. L. Casco (Gen. Dyn./Convair) 8 p refs (See N66-17390 08-05)

5. EVALUATION OF REPLACEMENT TIMES OF SPACECRAFT RADIOS UNDER SIMULATED WEIGHTLESSNESS D. H. Schuster (Collins Radio Co.) 16 p ref (See N66-17391 08-05)

6. SHIRTSLEEVE-SPACE SUIT EFFECTS ON HUMAN PERFORMANCE G. E. Hanff (Lockheed-Calif. Co.) 12 p (See N66-17392 08-05)

7. THE EFFECT OF REDUCED GRAVITY AND PRESSURE SUITS UPON OPERATOR CAPABILITY I. Streimer (San Fernando Valley State Coll.) 7 p refs (See N66-17393 08-05)

8. PHYSIOLOGICAL COST OF DONNING A FULL PRESSURE SUIT E. Hendler and D. W. Dery (Naval Air Engr. Center), and N. Miller (Jefferson Med. Coll.) 21 p refs (See N66-17394 08-05)

9. WORK AND THERMAL LOADS ON MEN WORKING IN SPACE SUITS H. P. Roth (Chrysler Corp.) 10 p refs (See N66-17395 08-05)

10. TRANSCRIPTION OF DISCUSSION AT SYMPOSIUM ON SPACE SUITS AND HUMAN PERFORMANCE John A. Roebuck (N. Am. Aviation, Downey, Calif.) 2 p

11. TRANSCRIPTION OF DISCUSSION AT SYMPOSIUM ON SPACE SUITS AND HUMAN PERFORMANCE Sidney A. Schwartz (Grumman Aircraft Engr. Corp.) 2 p

N66-17387 National Aeronautics and Space Administration. Manned Spacecraft Center, Houston, Tex.

LUNAR SURFACE AND FREE SPACE HAZARDS RELATING TO SPACE SUIT DESIGN

Jerry R. Goodman and Matthew I. Radnofsky *In* Chrysler Corp. A Collection of Papers on Spacesuits and Human Performance 16 Aug. 1965 25 p Presented at Human Factors Session, Ann. Inst. of Environ. Sci. Tech. Meeting, 22 Apr. 1965 (See N66-17386 08-05)

Anticipated lunar environmental conditions and effects on man are discussed along with how the Apollo Extravehicular Mobility Unit (EMU) allows man to perform under these conditions. The EMU provides protection by encapsulating the astronaut in a liquid-cooling anthropomorphous pressure vessel, the Pressure Garment Assembly (PGA), with 3.7 psia oxygen. A Portable Life Support System (PLSS) is carried on the astronaut's back and provides for PGA pressurization and oxygen supply, CO_2 removal, liquid and oxygen temperature control, telemetry of critical medical parameters, suit pressure and high oxygen flow sensing, and extravehicular communications. There is an auxiliary oxygen supply which is separated from the PLSS. A thermal-meteoroid garment will protect the PGA from the high velocity primary and secondary meteoroid particle environment, limit heat flux in and out of the EMU, and prevent local hot or cold spots during the short term contact with the lunar surface. M.W.R.

N66-17388 Aerospace Medical Div. Aerospace Medical Research Labs. (6570th), Wright-Patterson AFB, Ohio.

ZERO-G STUDIES AND PRESSURE SUITS

Edwin H. Sasaki *In* Chrysler Corp. A Collection of Papers on Spacesuits and Human Performance 16 Aug. 1965 6 p Presented at the Am. Psychological Assoc. Ann. Conv., Los Angeles, 6 Sep. 1964 (See N66-17386 08-05)

Zero gravity experiments indicate that a man wearing an inflated full-pressure suit could complete most of the assigned tasks during simulated space missions. Task completion, however, required more time in the space suit than in shirt sleeves. It is concluded that the encumberance of the pressure suit, which severely restricted mobility and limited kinesthetic feedback, contributed more to the performance decrement than did the weightless environment. It is, therefore recommended that design of pressurized suits be optimized. Studies discussed deal with egressing an adjustable iris, motions used during tunnel transfer, using handrails to move along a surface, soaring, walking, and donning and doffing a pressure suit. M.W.R.

N66-17389 National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.

PRELIMINARY INVESTIGATIONS OF SPACE MAINTENANCE

Jerome S. Seeman, Francis H. Smith, and Donald D. Mueller (Wright-Patterson AFB) *In* Chrysler Corp. A Collection of Papers on Spacesuits and Human Performance 16 Aug. 1965 23 p refs Presented at the Am. Psychological Assoc. Ann. Conv., Los Angeles, 6 Sep. 1964 Prepared jointly with Wright-Patterson AFB (See N66-17386 08-05)

Performance problems of space-suit clothed workers in maintaining space vehicles during short periods of weightlessness are investigated. Assuming appropriate training under one-g conditions and the use of a body tethering system, it appears unncessary to simulate zero-gravity conditions in order to study certain types of space maintenance performance. Removing and replacing a pre-start solenoid valve on a rocket engine was the specific task studied. Under both zero and one-g conditions, the space suit pressurization level contributes most to space maintenance activity performance decrement, which is defined as an increase in time required for the accomplishment of a given psychomotor task. A scheme is presented to compare performance on three psychomotor tasks relating percentage increase in performance time to suit pressurization. M.W.R.

N66-17390 General Dynamics/Convair, San Diego, Calif. Life Sciences Section.

THE USE OF SPACESUITS IN WATER IMMERSION STUDIES

Bernard F. Pierce, Richard L. Wolf, and Ernest L. Casco *In* Chrysler Corp. A Collection of Papers on Spacesuits and Human Performance 16 Aug. 1965 8 p refs (See N66-17386 08-05)

Since water immersion has been demonstrated to be a satisfactory method of simulating various physical effects of zero gravity, a review of two related studies and consideration of future research operations are discussed. The suit system and breathing equipment are the two basic systems that studies must consider; and development of adequate communications with the underwater subjects is deemed essential. It is pointed out that with presently available techniques, underwater space-suit operations have already presented information for practical, manned space vehicle design problems. M.W.R.

N66-17391 Collins Radio Co., Cedar Rapids, Iowa. Process Development Div.

EVALUATION OF REPLACEMENT TIMES OF SPACECRAFT RADIOS UNDER SIMULATED WEIGHTLESSNESS

Donald H. Schuster *In* Chrysler Corp. A Collection of Papers on Spacesuits and Human Performance 16 Aug. 1965 16 p refs (See N66-17386 08-05)

Mechanical aspects of maintaining two prototype radios for spacecraft communications systems were evaluated under two simulated weightlessness conditions: (1) subjects worked on dry land without gloves and (2) scuba divers worked underwater with gloves on neutrally buoyant radio mockups. It was found that on dry land, the VHF unit required 530 seconds to remove and replace, while 1009 seconds were needed underwater; the SHF unit took 375 seconds on dry land and 644 seconds underwater. It is noted that the main effects of environment and unit were considerably more important than this interaction between environment and radio unit. Further, it was noted that time required was considerably shortened by practice. Two multiple regression analyses were made; and in the nonlinear case, a multiple correlation coefficient of 0.873 was obtained for predicting maintenance time. Comments of subjects regarding design of the wrench used and stress conditions are noted. M.W.R

N66-17392 Lockheed-California Co., Burbank. Human Engineering and Maintenance Design Dept.

SHIRTSLEEVE-SPACESUIT EFFECTS ON HUMAN PERFORMANCE

George E. Hanff *In* Chrysler Corp. A Collection of Papers on Spacesuits and Human Performance 16 Aug. 1965 12 p Presented at the Am. Psychological. Assoc. Ann Conv., Los Angeles, 6 Sep. 1964 (See N66-17386 08-05)

A historical summary of research dealing with the effects on man's performance of a fully pressurized space suit is presented, especially as related to a frictionless environment typical of unpowered space flight. One test series compared the time required to complete 10 tasks in shirt sleeves, in an unpressurized Navy Mark IV suit, and in the same suit under full pressure. Maintenance activites under full suit pressure were shown to be feasible. Two tasks, writing and safety wiring, exhibited quality deterioration in the end product. The most important single factor detrimental to performance was the fit of the gloves; fatigue incurred while holding any part of the body contrary to that imposed by the suit's natural position was next; and the inadequate cooling provided by the suit was another factor. A Zerog device, a harness which provides frictionless freedom in pitch and yaw was devised for another experiment to afford reasonable simulation of zero gravity. Experimental results indicated that while space maintenance can be accomplished in a space suit, improvements must be made in the suit to permit freer movement and better cooling. Basic shirt sleeve orientation and energy expenditure tests are underway in an improved Zerog simulator. M.W.R.

N66-17393 San Fernando Valley State Coll., Northridge, Calif. Dept. of Psychology.

THE EFFECT OF REDUCED GRAVITY AND PRESSURE SUITS UPON OPERATOR CAPABILITY

Irving Streimer *In* Chrysler Corp. A Collection of Papers on Spacesuits and Human Performance 16 Aug. 1965 7 p refs Presented at Am. Psychological Assoc. Ann. Conv., Los Angeles, 6 Sep. 1964 (See N66-17386 08-05)

Literature dealing with the output characteristics and life support requirements for human operators in space environments is reviewed, with particular reference to the design of manned space systems. The performance decrement due to wearing of pressurized suits is considered; and it is emphasized that more precise definitions of human capabilities under reduced gravity conditions must be made before many elements of space system design can be adequately assessed. M.W.R.

N66-17394 Naval Air Engineering Center, Philadelphia, Pa. Aerospace Crew Equipment Lab.

PHYSIOLOGICAL COST OF DONNING A FULL PRESSURE SUIT

Edwin Hendler, Donald W. Dery, and Neil Miller *In* Chrysler Corp. A Collection of Papers on Spacesuits and Human Performance 16 Aug. 1965 21 p refs (See N66-17386 08-05)

Several tests are described which were used to identify and quantitatively evaluate the physiological cost of donning a full pressure suit under space and time limitations. It was found that experienced subjects expended approximately one kcal energy per kg of body weight while putting on the Navy MK-4 full pressure suit under test conditions. The mechanical efficiency of the donning task cannot be evaluated because there is no available measure of physical work accomplished. Although studies were not made of donning shape variation, it is evident that in addition to need for sufficient volume, the shape of the volume is also an important factor. It is considered desirable for the subject to be able to dress in a roughly cylindrical volume with the long axis parallel to his own body long axis. Suit fit appears to have had an important effect on both the effort and time required for donning. M.W.R.

N66-17395 Chrysler Corp., New Orleans, La.

WORK AND THERMAL LOADS ON MEN WORKING IN SPACESUITS

Herman P. Roth *In its* A Collection of Papers on Spacesuits and Human Performance 16 Aug. 1965 10 p refs (See N66-17386 08-05)

Preliminary data relating to energy expenditure, oxygen consumption, and work level indicate that presently designed space suits constitute a major obstacle to efficient or even acceptable performance of physical tasks by astronauts on the lunar surface. Improved mobility under pressurized conditions is essential, and would reduce metabolic heat production from man. Further experiments under zero or reduced gravity conditions are considered essential. A chart presents comparative values of energy expenditure and heat production from some familiar physical activities, as well as information for men walking in both pressurized and unpressurized space suits. M.W.R.

N66-17429# Public Health Service, Cincinnati, Ohio. Div. of Water Supply and Pollution Control.

WASTE DISPOSAL ON SPACECRAFT AND ITS BEARING ON TERRESTRIAL PROBLEMS

Linvil G. Rich (Clemson Coll.), William Marcus Ingram, Robert A. Taft, and Bernard G. Berger Aug. 1965 21 p refs *Its* Environ. Health Ser.

(PB-168787; PHS-Publ.-999-WP-29) CFSTI: HC $1.00/MF $0.50

A completely regenerative system is outlined which would furnish the physiological requirements of humans living in an in the system which would convert organic constituents of waste to inorganic forms. An aerobic, thermophilic, microbiological process is discussed in detail in which the conversion of organics might be accomplished very efficiently. The process would be continuous and completely mixed. A large recirculation ratio would be used, and the microorganisms in the recirculated flow would be destroyed thermally. Author

N66-17481*# Massachusetts General Hospital, Boston. Radiology Dept.

SOLID CHEMICAL RADIATION DOSIMETER Annual Report

Majic S. Potsaid 20 Dec. 1965 34 p refs
(Grants NsG-719; NsG-262)
(NASA-CR-70462) CFSTI: HC $2.00/MF $0.50 CSCL 06R

This report presents results of investigations carried out to determine the usefulness of the HAP solid chemical system for charged particle dosimetry. Protons from a 160 MeV cyclotron and beta rays from a strontium-90 plaque were the radiations studied. More precise quantitative data about specific uses of translucent tissues is given, and includes approximating formulations in proton dosimetry. In addition to presenting the effect of specific gravity and effective atomic number, studies are given to illustrate dose distribution in phantoms irradiated with proton beams of different sizes. Analyses of the Bragg peak as well as the shaft of the proton beam are included in the experiments. C.T.C.

N66-17483# Medical Biological Lab. RVO-TNO, Rijswijk (Netherlands).
DETERMINATION OF MILK RADIOACTIVITY AFTER AN ATOMIC ATTACK [METING VAN RADIOACTIVITEIT IN MELK NA EEN ATOOMBOMAANVAL]
M. H. J. Huguenin and Joh. Blok Jul. 1965 22 p *In* DUTCH; ENGLISH summary
(MBL/1965/22; TDCK-43734) CFSTI: HC $1.00/MF $0.50

The radioactivity of milk produced after an atomic attack can be monitored efficiently after arrival at a distribution centre by means of a Geiger-Miller counting tube. If iodine-131 and strontium-89 are the main radionuclides discrimination between both is possible if a counting tube with a thin glass wall is used. Iodine-131 can be determined by measuring its gamma-activity removing all beta particles with an aluminum absorber. A measurement without absorber yields the total beta activity. If a suitable arrangement is chosen the sensitivity is sufficient for emergency conditions, provided that the background radiation due to any radioactive fall-out in the vicinity is reduced by 10 cm of lead around the counting set-up. Some suggestions are given for the further technical development of an apparatus that could be used in practice.
Author

N66-17484# Medical Biological Lab. RVO-TNO, Rijswijk (Netherlands).
MORTALITY OF RADIATION CHIMERAS IN RELATION TO THE NUMBER OF TRANSPLANTED BONE MARROW AND LYMPH NODE CELLS
O. Vos Aug. 1965 23 p refs Sponsored by EURATOM
(MBL/1965/23; TDCK-43735) CFSTI: HC $1.00/MF $0.50

In parental $\rightarrow F_1$ and allogeneic radiation chimeras an increased number of administered lymph node cells causes an increased and advanced mortality. Depending upon the number of lymph node cells inoculated the time of death can lie between a few days and about 70 days after irradiation. Excessive doses of injected bone marrow cells give an increased death rate only in some host-donor combinations. Great numbers of bone marrow cells raise the death rate after injection of lymph node cells in some host-donor combinations but counteract this killing effect in other combinations. The number of immunologically competent cells in bone marrow from both CBA and C57BL mice is small. In CBA mice an equivalent number of immunologically competent cells was estimated in 20×10^6 bone marrow and in $0.05-0.1\times10^6$ lymph node cells; for C57BL mice these figures were 50×10^6 bone marrow and 0.4×10^6 lymph node cells. For an explanation of the results the hypothesis is postulated that a competition exists between immunologically tolerant cells developing from pluripotent stem cells in bone marrow and immunologically competent lymphatic cells. Author

N66-17491# Commissariat a l'Energie Atomique, Fontenay-aux-roses (France). Department de la Protection Sanitaire.
DETERMINATION OF SODIUM AND POTASSIUM IN BIOLOGICAL MEDIA BY NEUTRON ACTIVATION WITHOUT CHEMICAL SEPARATION [DOSAGE DU SODIUM ET DU POTASSIUM DANS LES MILIEUX BIOLOGIQUES PAR ACTIVATION NEUTRONIQUE SANS SEPARATION CHIMIQUE]
Georges Marble, Michel Bernier, Michel Bertet, and Gaston Gaude Jul. 1965 28 p refs In FRENCH
(CEA-R-2837)

A relatively simple method for determination of sodium and potassium in biological media was developed. No chemical separation is required. The measurement of the gamma and beta activities induced by activation is carried out using scintillation detectors connected to a multi-channel amplitude selector and a counting unit. The results obtained are excellent for sodium and satisfactory in the case of potassium in biological experiments. Author (NAS)

N66-17546# Norsk Radiumhospital, Oslo.
PHOTOGRAPHIC ISODOSE MEASUREMENTS IN INHOMOGENEOUS MATTER
Olav Netteland [1964] 10 p Presented at the Symp. of High Energy Electrons, Montreaux, Switzerland, Sep. 1964
(Contract AT(30-1)-2607)
(Conf-640918-2) CFSTI: HC $1.00/MF $0.50

Preliminary results from electron photographic isodose measurements in inhomogeneous media are presented. All measurements were made at three different energies, 11.0, 18.5, and 30.0 Mev. Factors considered in the results were influence of air volumes, influence of low density materials, build up effects, and influence of solid bone. NSA

N66-17587# Human Factors Research, Inc., Los Angeles, Calif.
GEOGRAPHIC ORIENTATION IN AIRCRAFT PILOTS: METHODOLOGICAL ADVANCEMENT
James J. Mc Grath, William E. Osterhoff, Merlyn L. Seltzer, and Gail J. Borden Oct. 1965 55 p refs
(Contract Nonr-4218(00); Proj. Janair)
(TR-751-5; AD-624616) CFSTI: HC $3.00/MF $0.75

The report describes a revision in a cinema method of simulating low-altitude flight. Cockpit instruments used in dead reckoning were activated and synchronized with the motion picture scene. The throttle control was linked to the projector motor to provide the pilot with control of the simulated speed of the aircraft. An automated response system was devised to provide more accurate performance measurement, and the experimental procedure was revised to provide a more effective practice session prior to test sessions. A methodological study showed that the new experimental method improved geographic orientation in pilots during simulated flight.
Author (TAB)

N66-17615# Purdue Univ., Lafayette, Ind. School of Electrical Engineering.
AN APPLICATION OF STOCHASTIC AUTOMATA TO THE SYNTHESIS OF LEARNING SYSTEMS
K.-S. Fu and Robert Wayne Mc Laren Sep. 1965 173 refs
(Grant NSF GP-2183)
(TR-EE65-17; PRF-3810)

Several stochastic automation models for learning systems were proposed that relate the successive probability distributions of its response and environmental feedback through a learning algorithm. These models possessed the following

learning behavior: (1) The performance measure converged monotonically in the mean sense to a final maximum—or minimum—value; (2) the interaction proceeded in the on-line manner; and (3) in the time limit, the response of the learning system which extremized the mean performance was determined without error. Analysis of a continuous valued response stochastic automation learning model with discrete time showed that the response was determined in the time limit close to the best response. Stochastic automation learning models with higher order Markov processes were also discussed. Expressions for the learning rate and the variations in performance for most proposed models were formed. Also considered were pattern recognition devices and control systems with emphasis on character recognition. An example computer simulation of a character recognition device employing a linear stochastic learning model was included. G.G.

N66-17620# Joint Publications Research Service, Washington, D. C.
"FLIGHT" IN A SPACE TRAINING VEHICLE
A. Khorobrykh 28 Jan. 1966 9 p Transl. into ENGLISH from Izv. (Moscow), 20 Jan. 1966 p 6
(JPRS-33934; TT-66-30377) CFSTI: $1.00

A very brief description of a simulated flight in a space training capsule is presented. Eight test persons shared this simulated environment for almost a month's duration. The working day of the crew was strictly organized by operational procedures, physical exercise, medical examinations, and a variety of experimental studies. G.G.

N66-17623# Joint Publications Research Service, Washington, D. C.
THE HYPOPHYSIS AND ADRENALS IN THE PRESENCE OF RADIATION INJURIES TO THE ORGANISM
V. I. Kandror 14 Feb. 1966 27 p Transl. into ENGLISH from the publ. Gipofiz i Nadpochechniki pri Radiatsionnykh Porazheni Yakh Organizma (Moscow), 1965 p 13–33 and 129–133
(JPRS-34120; TT-66-30562) CFSTI: $1.00

The concepts presented comprise an explanation for the distinct similarity between a number of symptoms of radiation sickness and certain signs of functional disturbances in the endocrine system. This pertains primarily to the pituitary and adrenal glands because of their great activity in the constitutional adaptation of an organism to environmental changes. Experiments are carried out which show that animals whose adrenal glands are shielded from radiation can withstand significantly greater dosages, while sustaining lesser physiological and morphological damage, than can other animals whose glands are not shielded. Thus, the preservation of the total organic resistance to radiation depends on the proper functioning of intact adrenals, which themselves are very sensitive to ionizing radiation. On the basis of these and other experiments involving the hypophysis and the pituitary glands, hormones, and glucose production, it is finally concluded that many of the symptoms of radiation sickness, as well as certain of the regenerative phenomena, are formed with the direct participation of the hypophysis–adrenal system. D.T.

N66-17638# Joint Publications Research Service, Washington, D. C.
ALGORITHMS OF AN OPERATOR'S ACTIONS IN EMERGENCY SITUATIONS
B. M. Yankelevich 18 Feb. 1966 14 p refs Transl. into ENGLISH from Vopr. Psikhologii (Moscow), no. 6, Nov.–Dec. 1965 p 119–125
(JPRS-34200; TT-66-30641) CFSTI: HC $1.00

Logic diagrams of a pilot's actions in special flight conditions were developed from elements determining a given malfunction and the sequence of actions directed towards correction of the given malfunction. The structure of the resolving algorithm was expressed in a "logic tree" form in which problem solutions were carried out by successive approximation. An example algorithm of the pilot's action during loss of engine resolutions was shown graphically. It was concluded that graphic expression of a set of actions by an operator facilitates comprehension, memorization, and reproduction of these actions. G.G.

N66-17644# Army Biological Labs., Fort Detrick, Md. Physical Sciences Div.
PHYSICOCHEMICAL PROPERTIES OF PURIFIED STAPHYLOCOCCAL ENTEROTOXIN B Technical Manuscript No. 140
Jack Wagman, Richard C. Edwards, and Edward J. Schantz Jul. 1964 24 p refs
(AD-444380)

Staphylococcal enterotoxin B exhibited a high degree of molecular homogeneity as determined by synthetic boundary spreading, approach-to-equilibrium sedimentation, and sedimentation equilibrium distribution in a density gradient. Its partial specific volume and infrared spectral absorption were typical of simple proteins. The molecular weight by sedimentation-diffusion was found to be 35,300 and was in good agreement with results by the Archibald procedure. There was stability in sedimentation behavior over a wide pH range (5 to 10) and an observed transition to a more extended structural form at pH 3.8. A net hydration of 0.075 gram of water per gram of protein was evaluated by extrapolation to zero sedimentation rate in aqueous sucrose, and values 0.158 and 0.136 gram per gram were obtained from measurements of enterotoxin density and solvated molecular weight (40,100), respectively, in buoyant cesium chloride solution. Intrinsic viscosity and sedimentation-diffusion data were combined to yield a value of 2.14 × 10 to the 6th power for the Scheraga-Mandelkern parameter beta. The latter is discussed in terms of its implications as to the nature of the hydrodynamic enterotoxin unit. Author (TAB)

N66-17666*# National Aeronautics and Space Administration, Washington, D. C.
PROGRESS IN DEVELOPMENT OF METHODS IN BONE DENSITOMETRY
G. Donald Whedon, William F. Neumann (Rochester Univ.), and Dale W. Jenkins, ed. 1966 199 p refs Proc. of Conf. held in Washington, D. C., 25–27 Mar. 1965; Sponsored by NASA, NIH, and Am. Inst. of Biol. Sci.
(NASA-SP-64) GPO: HC $1.50; CFSTI: MF $1.25 CSCL 06E

Report contains papers on X-ray densitometry, other methods of densitometry, and application of techniques in human studies. For individual titles see N66-17667–N66-17686.

N66-17667* National Institutes of Health, Bethesda, Md. Dept. of Radiology.
THEORETICAL ASPECTS OF RADIOGRAPHIC DENSITOMETRY
S. David Rockoff *In* NASA, Washington Progr. in Develop. of Methods in Bone Densitometry 1966 p 7–10 (See N66-17666 08-04) GPO: HC $1.50; CFSTI: MF $1.25

Consideration is given to sources of systematic bias which may occur during the determination of bone mineral *in vivo* by quantitative radiographic densitometry. Scan lines are shown across bone and the calibration wedge to indicate the manner in which the mean optical density of bone is expressed

in terms of wedge thickness. Since the procedure depends on the film response curve, data are presented to indicate the factors in radiographic densitometry which can be varied without creating biased results. If a calibration wedge is to provide a reliable standard, results indicate that field size; kilovoltage; and film type, holder, and processing technique must be kept constant. Also, there must be a linear relationship between a given increment of wedge material and bone mineral at every level. The loss of linearity with large X-ray fields demonstrates the importance of using small X-ray fields for quantitative densitometry. Treatment of the film response curve to increase precision and convenience, while maintaining a reliable index of mineral content, is considered. M.W.R.

N66-17668* Pennsylvania State Univ., University Park. Dept. of Biophysics.

QUANTITATIVE RADIOGRAPHY OF THE SKELETON IN LIVING SYSTEMS

Harold Schraer *In* NASA, Washington Progr. in Develop. of Methods in Bone Densitometry 1966 p 11–20 refs (See N66-17666 08-04) GPO: HC $1.50; CFSTI: MF $1.25

A quantitative technique is described for the measurement of bone mass and bone density from roentgenograms; and evidence presented indicates this procedure provides data on animals and man which correlate with physical and chemical properties of bone as well as with alterations of physiological and pathological significance in the skeletal system. The bone density measuring equipment is described and illustrated. Computation of X-ray mass coefficient is detailed in the case of the rat femur, but is applicable to other bones in other animals where there is relatively little soft tissue. Sources of error and reproducibility of the method are considered; evaluations of 40 films indicated the mean difference between two readings to be only 2.66% with a standard error of 0.40. Some data on bone density measurements in humans are included. M.W.R.

N66-17669* Leeds Univ. (England). General Infirmary.

MEASUREMENT OF CORTICAL BONE VOLUME AND LUMBAR SPINE DENSITY

B. E. C. Nordin, E. Barnett, D. A. Smith, and J. Anderson *In* NASA, Washington Progr. in Develop. of Methods in Bone Densitometry 1966 p 21–30 refs (See N66-17666 08-04) GPO: HC $1.50; CFSTI: MF $1.25

Anatomical measurements of metacarpal cortical thickness, femoral cortical thickness, and biconcavity are applied to a study of 152 normal women. Biconcavity does not appear to be an accompaniment of aging in these women, but the other two measurements fall with age, with particular acceleration at the beginning of the seventh decade. Relative vertebral density falls directly with age, and most of this fall occurs rather abruptly between 50 and 55 years. Reproducibility of the method is found to be good. Duplicate estimations of relative vertebral density from 20 films produced an error of ±0.15. Repeat X-rays on 24 patients within 24 hours resulted in an error of ±0.29; X-rays within one month on 31 patients resulted in an error of ±0.31. M.W.R.

N66-17670* Texas Womens Univ., Denton. Nelda Childers Stark Lab.

RADIOGRAPHIC BONE DENSITOMETRY

Pauline Beery Mack *In* NASA, Washington Progr. in Develop. of Methods in Bone Densitometry 1966 p 31–46 refs (See N66-17666 08-04) GPO: HC $1.50; CFSTI: MF $1.25

Instrumentation for a bone densitometer assembly and sequence of operations in making a bone mass determination are described. The digital readouts secured from the integrator may be used directly or converted by a mathematical formula. A selection of tracking paths is given for bone mass evaluations of the os calcis, middle phalanx in the fifth digit, and patella; and positioning of subjects for the required radiographs is discussed. Selection of radiographic exposure conditions is considered along with the importance of collimation of X-ray beam in obtaining accuracy of bone mass results. A comparison is made of evaluations of calcium hydroxide based on corrected and uncorrected traces of the calibration wedge. Reproducibility of bone densitometer tracing techniques is considered to be represented at the 99% confidence level by a range of error of 0.75% above and below the mean for a total range of 1.5%. M.W.R.

N66-17671* Texas Womens Univ., Denton. Nelda Childers Stark Lab.

FACTORS AFFECTING THE PRECISION OF RADIOGRAPHIC DENSITOMETRY OF THE LUMBAR SPINE AND FEMORAL NECK

George P. Vose *In* NASA, Washington Progr. in Develop. of Methods in Bone Densitometry 1966 p 47–63 (See N66-17666 08-04) GPO: HC $1.50; CFSTI: MF $1.25

Results are presented for some experiments on the effects of numerous radiographic variables on densitometry of the lumbar spine and femoral neck. A generalized technique is described which requires the use of high speed films, calibrated intensifying screens, and rigid controls. Absorption standard is discussed and the absorber, consisting of an aluminum alloy wedge and bone ash embedded in plexiglass, is illustrated. Consideration is given to kilovoltage effects, intensity of exposure, beam filtration, film processing factors, and instrument and process reproducibility. Calcium changes detectable by radiographic densitometry are investigated, and a summary of the variable errors analyses is tabulated. The major error in X-ray densitometry of the third lumbar vertebra and the femoral neck appears to be the failure to reposition the subject to precisely the same way for follow-up exposures. Total error appears to be about 2% although greater errors may occur. M.W.R.

N66-17672* Fels Research Inst., Yellow Springs, Ohio.

COMPARISON OF CORTICAL THICKNESS AND RADIOGRAPHIC MICRODENSITOMETRY IN THE MEASUREMENT OF BONE LOSS

Stanley M. Garn, Elise Feutz, Charles Colbert, and Betty Wagner *In* NASA, Washington Progr. in Develop. of Methods in Bone Densitometry 1966 p 65–77 refs (See N66-17666 08-04) GPO: HC $1.50; CFSTI: MF $1.25

Measurements of cortical thickness are considered relatively simple, may be used with previously taken radiographs, and are particularly applicable to studies involving bone change. A loss of as little as 5% of cortical thickness may be measured reliably with total cortical material exceeding 5.0 mm. Reliability of these measurements is found to be better than 0.98, and validity exceeds 0.90; and the measurements demand minimal deviation from the usual radiographic procedures. Such measurements are unaffected by fall-off of illumination from the central ray, processing errors, or deformation of calibration curve. In many instances, densitometric trace can provide the same information on size as obtained by micrometry; and both qualitative and quantitative information on the sites of bone loss may be obtained. M.W.R.

N66-17673* Fels Research Inst., Yellow Springs, Ohio. Dept. of Growth and Genetics.

THE INTERRELATIONSHIP BETWEEN BONE DENSITY AND CORTICAL THICKNESS IN THE SECOND METACARPAL AS A FUNCTION OF AGE

Napoleon Wolanski and James Eagen *In* NASA, Washington Progr. in Develop. of Methods in Bone Densitometry 1966 p 79–84 refs (See N66-17666 08-04) GPO: HC $1.50; CFSTI: MF $1.25

Mineral content of bone cortex is investigated in relation to thickness in the second metacarpal as a function of age. The method presented permits an examination of the process of bone mineralization *in vivo*, and appears to be good for the diagnosis of osteoporosis and other diseases of bone metabolism. When measurements were taken from 176 male and 153 female subjects, ranging in age from 2 to 74 years, a fairly regular growth of cortical thickness and bone density was found with increasing age to about 27–34 in men and 28–31 years in women. There appears to be greater thickness in the men, but greater dnesity in women. After the maximum has been reached in women, there is a rather sharp decline in bone density and slow decline in cortical thickness. For men, the cortical thickness remains the same even after bone density has begun to decrease between the ages of 34 and 38; after this thickness is accelerated while bone density remains on a steady level. M.W.R.

N66-17674* Wisconsin Univ., Madison.

BONE MINERAL MEASUREMENT BY IMPROVED PHOTON ABSORPTION TECHNIQUE

John R. Cameron and James A. Sorenson *In* NASA, Washington Progr. in Develop. of Methods in Bone Densitometry 1966 p 87–93 refs (See N66-17666 08-04) GPO: HC $1.50; CFSTI: MF $1.25

Experimental results indicate that a pulse height analyzer and carefully chosen operating conditions are required for accurate measurements of bone mineral content by the photon absorption technique. An improved scanning system has been constructed for *in vivo* measurements on the radius, metacarpals, phalanges, and other bones in humans. The equipment used is illustrated and described, and graphs depict the effect of lucite scatterers on measured bone mass. M.W.R.

N66-17675* Wisconsin Univ., Madison.

QUANTITATION OF BONE MINERAL MEASUREMENT IN THE DOMESTIC HEN

Steven W. Babcock and Juan Montilla *In* NASA, Washington Progr. in Develop. of Methods in Bone Densitometry 1966 p 95–102 refs (See N66-17666 08-04) GPO: HC $1.50; CFSTI: MF $1.25

Measurement of bone mineral content by the Cameron-Sorenson technique of attenuation of a monoenergetic photon beam is found to be an accurate measure of bone weight or mass in the domestic hen. The technique is able to detect a change in total body calcium of the order of 10%, and results are found to be reproducible to within at least 5%. By plotting the number of eggs laid by pullets against bone mass, regression curves are obtained which indicate the technique capable of measuring the bone mineral loss following laying of a single egg. Average decline in bone mass with each egg laid was 0.76 bone mass unit, which is equivalent to 8.7 mg bone ash per linear centimeter of the bone measured. Bone mineral content was found to decline with maturation and to a cage layer fatigue syndrome, the latter appears to be related to mineral metabolism. M.W.R.

N66-17676* Franklin GNO Corp., West Palm Beach, Fla.

PRECISION METHODS USING SOFT PENETRATING RADIATION FOR BONE DENSITOMETRY

Martin J. Cohen and Albert J. Gilson (Jackson Mem. Hosp.) *In* NASA, Washington Progr. in Develop. of Methods in Bone Densitometry 1966 p 103–114 refs (See N66-17666 08-04) GPO: HC $1.50; CFSTI: MF $1.25

Soft X-radiation instrument possibilities in bone densitometry are discussed in terms of a narrow bone geometry which undergoes nearly exponential attenuation that is sensitive to both the atomic number of the absorbing material and the energy of the radiation. Two instrument approaches are considered to be within present capabilities. One uses a two-gamma radioisotope source for all kinds of clinical studies; the other uses an X-ray tube to explore the ultimate limits of laboratory precision and to evaluate accuracy. The latter utilizes the physical model of the bone, treats the elements involved as seven independent variables, and permits dual monochromatic and n-monochromatic design. In the dual gamma instrument, the relationship between the two models of the structure is considered. M.W.R.

N66-17677* Chicago Univ., Ill.

IODINE-125 BONE DENSITOMETRY

Nels M. Strandjord and Lawrence H. Lanzl *In* NASA, Washington Progr. in Develop. of Methods in Bone Densitometry 1966 p 115–126 refs (See N66-17666 08-04) GPO: HC $1.50; MF $1.25

Difficulties in making distinctions between osteomalacia and osteoporosis are considered along with their etiologies in a study dealing with the use of radioactive iodine 125 to determine the condition of bone mineral. Methods used to study transmission of radiation emission through a single finger bone are included, and instrumentation and data handling are discussed. Measurements are expressed as linear coefficients of absorption of total bone. It is shown that for bones of equal total diameter, the one with the thinner cortex will give a lower coefficient. M.W.R.

N66-17679* Washington Univ., Seattle.

SONIC MEASUREMENT OF BONE MASS

Clayton Rich, Eli Klink, Ray Smith, Ben Graham, and Peter Ivanovich *In* NASA, Washington Progr. in Develop. of Methods in Bone Densitometry 1966 p 137–146 refs (See N66-17666 08-04) GPO: HC $1.50; CFSTI: MF $1.25 (Grant PHS A-4701)

Instrumentation used to measure bone masses by sonic methods is discussed, and several applications of ultrasound to measurement of tissue *in situ* are reported. Most of the work is based on the reception of a sound reflection from some interphase within the tissue examined. The system indicates promise of accurate measurements of the bone masses of the tubular portions of limbs, and may have applications to determine some properties of soft tissues. Advantages of the system are its precision, safety, speed of operation, and accuracy; the last in cortical bone measurements. M.W.R.

N66-17680* Sumerlin Memorial Pathology Lab., San Diego, Calif.

RATES OF INVOLUTION OF VERTEBRAE AND FEMUR IN AGING

James S. Arnold and Murray H. Bartley *In* NASA, Washington Progr. in Develop. of Methods in Bone Densitometry 1966 p 149–154 (See N66-17666 08-04) GPO: HC $1.50; CFSTI: MF $1.25

Actual ash per unit volume in vertebral centrums has been measured in autopsy specimens. Results indicate a progressive increase in ash concentration during the first 20 years of life, although the levels are somewhat lower in females than in males in the case of persons dying from trauma or from ruptured cerebral or abdominal aneurysms. Similar data are found for persons suffering a variety of chronic diseases; and it is indicated that there is a definite reduction in vertebral mineralization in chronic debilitating disease, and this is more conspicuous in females. When maximum femoral thickness is plotted against ash content of vertebral medullary tissue, there appear to be virtually no cases where the femoral cortex atrophies in the presence of a normal degree of vertebral mineralization. It is found that female bones atrophy while male bones generally do not. M.W.R.

N66-17681* Leeds Univ. (England). General Infirmary.
THE APPLICATION OF MEASUREMENTS OF BONE VOLUME AND SPINAL DENSITY
B. E. C. Nordin, D. A. Smith, J. Mac Gregor, and J. Anderson *In* NASA, Washington Progr. in Develop. of Methods in Bone Densitometry 1966 p 155–162 (See N66-17666 08-04) GPO: HC $1.50; CFSTI: MF $1.25

Measurements of relative vertebral density are found to be in general agreement with visual assessment of 119 unselected X-ray films. Relative vertebral density falls with age, especially in women who have passed the menopause. In these measurements made on women with backaches and suspected osteoporosis, vertebral density is generally related to metacarpal cortical thickness. While the measurement of vertebral density appears to be a valid procedure, precision, accuracy, and reproducibility of the method require further attention. Occasionally normal measurements are made on patients with biconcavity, and there appears to be no consistent change in spinal density due to calcium therapy. M.W.R.

N66-17682* Chicago Univ., Ill.
ESTROGENS AND POSTMENOPAUSAL OSTEOPOROSIS
Nels M. Strandjord and Lawrence H. Lanzl *In* NASA, Washington Progr. in Develop. of Methods in Bone Densitometry 1966 p 163–167 ref (See N66-17666 08-04) GPO: HC $1.50; CFSTI: MF $1.25

A gradual loss of bone mass is exhibited with increasing age in a study comparing premenopausal normal females, and postmenopausal females on stilbestrol and those without benefit of hormones. Comparison of the postmenopausal patients indicates retardation of bone aging, or osteoporosis, in patients given exogeneous estrogens. Results are expressed in terms of a decrease in linear coefficient of absorption of total bone. Measurements of cortical bone thickness do not appear to be as accurate as those of total bone. M.W.R.

N66-17683* Texas Womens Univ., Denton. Nelda Childers Stark Lab.
CALCIUM LOSS STUDIES DURING HUMAN BED REST: A PRELIMINARY REPORT
Pauline Beery Mack *In* NASA, Washington Progr. in Develop. of Methods in Bone Densitometry 1966 p 169–177 refs (See N66-17666 08-04) GPO: HC $1.50; CFSTI: MF $1.25

Metabolic and bone mass changes resulting from continuous periods of bed rest are investigated in 17 healthy adult males. Results are given for five 14-day and one 30-day bed rest unit; each unit is preceded by an ambulatory preconditioning period and followed by an ambulatory reconditioning period. A summary of data on calcium consumption, excretion, and balance for the individuals participating in the bed rest units shows that the degree of negative balance varies between subjects within each unit, but that a general relationship exists between level of calcium intake and extent of negative balance. Feces are shown to change somewhat more than urine in calcium excretion at different levels of calcium intake. Change of bone mass in the central section of the os calcis generally follow the calcium level of the diet; changes in serum calcium have been very slight. M.W.R.

N66-17684* Texas Womens Univ., Denton.
REGRESSION CURVES FOR REPRESENTATIVE URINARY CALCIUM AND BONE MASS VALUES
Elsa Arciniegas Klapper and Pauline Beery Mack *In* NASA, Washington Progr. in Develop. of Methods in Bone Densitometry 1966 p 179–185 (See N66-17666 08-04) GPO: HC $1.50; CFSTI: MF $1.25

Regression curves are presented as calculated and plotted by the IBM 1620 computer from urinary calcium excretion and bone mass data obtained from men in bed rest and collateral ambulation studies. The studies consisted of feeding 0.7, 1.5, and 2.0 grams of calcium during three bed rest and three corresponding ambulatory periods to four healthy adult male subjects. Three figures illustrate how the regression curve can show trends in bone mass change and change in urinary excretion of calcium. R.N.A.

N66-17685* Fels Research Inst., Yellow Springs, Ohio.
NORMAL "OSTEOPOROTIC" BONE LOSS
Stanley M. Garn, Christabel G. Rohmann, Eleanor M. Pao, and Ethel I. Hull *In* NASA, Washington Progr. in Develop. of Methods in Bone Densitometry 1966 p 187–193 refs (See N66-17666 08-04) GPO: HC $1.50; CFSTI: MF $1.25

The age associated loss of cortical bone at mid-shaft on the second metacarpal was investigated in over 600 living whites, over 200 negro skeletons, and in 60 living individuals of Chinese and Japanese descent. Despite population differences in the average thickness of cortical bone, the loss in thickness approximated 20% in males and 30% in females of each group, with the bulk of the loss taking place after the fifth decade. Expressed as cortical area, loss rates were proportional. Explored on a purely longitudinal basis over a 15 to 30 year period, it was clear that bone loss was characteristic of the vast majority of aging individuals of both sexes. Individual long-term loss rates pointed to a very few who did not lose bone and a few who lost bone excessively. The latter may be considered true osteoporotics, distinguishable in longitudinal study from those who have little bone to begin with. Extrapolated to the entire skeleton, the normal loss of bone appears to be between 5 and 10% per decade, indicating, for a reference men or women in the 45 to 65 age group, an average calcium loss of 15 to 30 mg per day. R.N.A.

N66-17686* Henry Ford Hospital, Detroit, Mich. Div. of Endocrinology.
COMMENTS ON CORTICAL THICKNESS MEASUREMENTS
Richmond W. Smith, Jr. *In* NASA, Washington Progr. in Develop. of Methods in Bone Densitometry 1966 p 195–197 (See N66-17666 08-04) GPO: HC $1.50; CFSTI: MF $1.25

General comments are presented on cortical bone measurements for several groups of different ages and racial origins. There appear to be no differences in loss of metacarpal thickness between women with good and bad spines; a bad spine indicating loss of density of 1/M in the second and third lumbar vertebrae, based on visual observation. A definite regression with age of mid-shaft femoral cortical thickness is reported for a sample of 2000 subjects. M.W.R.

N66-17778*# National Aeronautics and Space Administration, Washington, D. C.
SIGNIFICANT ACHIEVEMENTS IN SPACE BIOSCIENCE, 1958-1964
1966 142 p refs
(NASA-SP-92) GPO: HC $0.55; CFSTI: MF $1.00 CSCL 06C

Significant achevements in the fields of exobiology, environmental biology, behavioral biology, molecular biology and bioinstrumentation, space flight programs, and manned space flight from 1958 through 1964 are discussed along with the significance of these accomplishments. R.N.A.

N66-17833# Hanford Atomic Products Operation, Richland, Wash. Biology Lab.
DIFFERENTIAL RESPONSES OF GERM CELLS IN FLOUR BEETLES, *TRIBOLIUM CASTANEUM* HERBST, DUE TO X-RAY DOSE, HYPOTHERMIA, SEX-EXPOSED AND AGE
Howard E. Erdman [1964] 21 p refs
(Contract AT(45-1)-1350)
(HW-SA-3747) CFSTI: HC $1.00/MF $0.50

Day-old virgin flour beetles, *Tribolium castaneum*, were x-irradiated with 0, 500, 1,000, 2,000, and 4,000 R. Ten replicates of control, male-, female-, and both-exposed mating combinations were established at 25, 29, and 32° C in 65 to 70 percent relative humidity. Each pair was given 5 g of acclimated food daily for two weeks. The number of fertile pairs and the number of F_1 adults were measured on the day of reproductive onset. Reproductive onset was delayed two to three days in females given 4000 R x-ray doses, but no delay was observed in exposed males. For both-exposed, a progressive delay was induced by 2,000 or 4,000 R. For male- or female-exposed groups irradiated from 29 to 32°C, no modification in reproductive onset was found, but a delay was evident at lower temperatures. The 2,000 or 4,000 R exposures and decreased temperatures synergistically delayed reproductive onset for both-exposed pairs. The number of fertile pairs after 4,000 R were reduced in female-exposed groups more than in male-exposed groups. A saturation effect in both-exposed combinations at 29°C was indicated. X-ray doses of 2,000 R and higher reduced productivity. Males were more productive after 4,000 R than were females. Viability or lethality effects were additive when both sexes of mating combinations were exposed to 2,000 or 4,000 R. The modifications of the three parameters investigated for productivity are discussed from the standpoints of temperature effects, and dose effects on the degree of development, and differentiation of male and female germ cells. The dose-response curves were the multi-hit type, implicating chromosomal aberrations as the cause of altered productivity. NSA

N66-17886*# National Aeronautics and Space Administration, Washington, D. C.
AEROSPACE MEDICINE AND BIOLOGY—A CONTINUING BIBLIOGRAPHY, WITH INDEXES, JANUARY 1966
Feb. 1966 113 p refs
(NASA-SP-7011(21)) CFSTI: HC $1.00/MF $0.75 CSCL 06E

A continuing bibliography on aerospace medicine and biology presents annotated references to unclassified reports and journal articles that were introduced into the NASA information system during January 1966. Indexes by subject, corporate source, and author are included. M.W.R.

N66-17938# Institut Pasteur, Paris (France).
INTERACTION OF RADIATION WITH DEOXYRIBONUCLEIC ACIDS. (SECOND YEAR OF STUDY) [INTERACTIONS DES RADIATIONS ET DES ACIDES DESOXYRIBONUCLEIQUES DEUXIEME ANNEE D'ETUDE]
R. Latarjet 1965 6 p In FRENCH
(Contract Euratom-030-63-3 BIOF)
(EUR-2470.f)

The effects of X- and gamma rays on polynucleotides (U, C, A) were studied in the presence and absence of oxygen; the quantum yields were measured in respect to the destruction of the bases and of the breaking of the phosphodiester chains. The consequences to the coding activity in the Niremberg system were measured. These ionizing radiation effects were compared with those of nitrogen mustard. Lastly, the part played by free radicals in these reactions was partially defined by electronic paramagnetic resonance measurements. The studies were extended to cover the effects of X-rays on Pneumococcus-transforming DNA, where a "marker rescue" phenomenon was discovered, and on DNA exchanges between growing bacteria, and, lastly, on the bacterium bacteriophage system in lysogenic bacteria. Research went forward on radioactive disintegration effects on DNA constituents (thymidine) and on certain cellular nucleic acids; in particular, the induction of a mutation aimed at radiation resistance in yeast under the effect of ^{32}P disintegrations was analysed in biochemical and genetic terms. This radiation resistance is associated with the existence of abnormal meiosis. In conclusion, the progress of the studies of radiation effects on bacterial genetic recombination is described. Author

N66-17943# Michigan Univ., Ann Arbor. Dept. of Zoology.
EFFECTS OF IONIZING RADIATIONS ON SUBMICROSCOPIC STRUCTURES AND RESULTING ALTERATIONS IN METABOLIC FUNCTION Final Report, 1 Sep. 1961-31 Dec. 1964
Norman E. Kemp Jul. 1965 28 p refs *Its* Rept.-04741-1-F
(Contract AT(11-1)-1080)
(COO-1080-1) CFSTI: HC $2.00/MF $0.50

Electron microscopic evidence for pycnotic changes in nuclei of epidermal cells of heavily irradiated frogs is presented. Submicroscopic damage occurred in the nuclei of some cells within a few hours after irradiation at 50,000 rads of gamma radiation. Cytoplasmic manifestations of damage appear to develop more slowly, perhaps after a day or two. Many cells of the organs examined showed no obvious submicroscopic changes during survival up to 5 days. Biochemical and autoradiographic evidence for altered patterns of uptake of radioactive glycine-^{14}C and phenylalanine-^{14}C is presented. The results indicate that 8 hours to 1 day after irradiation there is a tendency for enhanced uptake of labeled amino acids. Histochemical evidence for increased activity of acid phosphatase and alkaline phosphatase after heavy gamma irradiation of frogs is presented. Levels of gamma radiation higher than 50,000 rads will probably be necessary to cause obvious structural damage to the submicroscopic architecture of frogs within a short time after irradiation. Frogs can survive 100,000 rads for 2 days, but they are quickly killed at 200,000 rads. Biochemical and histochemical analyses appear to be more sensitive indicators of radiation damage than electron microscopy. In the future it would be advisable to look for submicroscopic changes in cells previously demonstrated to have undergone chemical change as a result of irradiation. Author (NSA)

N66-17950# Pharmatox Labs., Inc., Ames, Iowa.
PERCUTANEOUS TOXICITY STUDY OF STABLE RARE EARTHS IN RELATION TO INDUSTRIAL PROCESSING Progress Report, 1 Jan. 1964–30 Apr. 1965
1 Sep. 1965 16 p refs
(Contract AT(11-1)-1292)
(TID-22294)

Progress is reported on an experimental study conducted in laboratory animals to evaluate potential health hazards to workers exposed continually to rare earth metals in industry. Consideration is given particularly to the relationship of industrial solvents, coolants, and lubricants used in fabrication of rare earth metals into finished products. The rare earths studied are neodymium, dysprosium, and yttrium. The solvents used were: penetrating oil, trichloroethane, and motor oil. The three phases are: percutaneous studies in rabbits; mucous membrane contact studies in rabbits and dogs; and residue studies in tissues, urine, and feces. NSA

N66-17985 Institute for Cancer Research, Philadelphia, Pa.
STUDIES OF THE EFFECTS OF ULTRAVIOLET RADIATION ON CELL STRUCTURE AND BEHAVIOR Comprehensive Report, Mar. 1959–Nov. 1964
Jerome J. Freed 21 Jan. 1965 20 p refs
(Contract AT(30-1)-2356)
(TID-21611) CFSTI: HC $1.00/MF $0.50

Design features are described of a vibrating mirror flying spot ultraviolet microscope with incorporated television system. The instrument was designed for use in studies of the effects of ultraviolet radiation in single cells and changes in absorbancy associated with cell growth and mitotic division. The instrument was also used to study the effects of ultraviolet radiation from the microscope on systems within cells. Ascites cells irradiated with the flying spot microscope had a characteristic damage syndrome that was recorded by time lapse cinemicrography and used to determine the severity of the effect. It was established that the sensitivity to ultraviolet radiation was generally distributed through the cytoplasm of the cell, that the action spectrum for production of the effect was probably of the protein type, and that the sensitivity of the cells declined as the tumor grew in the host animal. In similar experiments carried out on cultured cells grown attached to glass, it was found that very small radiation doses interfered with motile behavior and higher doses caused retraction of the cells. The effects of metabolic inhibitors were also studied. Cytological studies were initiated in cultured cells of *Rana pipiens* and the propagation of Lucké tumor virus in cells in culture. A list is included of publications during the period. NSA

N66-18011*# California Univ., La Jolla. Visibility Lab.
EXPERIMENT S-8/D-13, VISUAL ACUITY AND ASTRONAUT VISIBILITY
Seibert Q. Duntley, Roswell W. Austin, John H. Taylor, and James L. Harris *In* NASA, Washington Manned Space-Flight Expts.: Gemini V Mission [1966] p 45–74 (See N66-18006 08-34) CFSTI: HC $5.00/MF $1.25

Preflight, in-flight, and postflight tests of the visual acuity of both the Gemini V crew members showed no statistically significant change in their visual capability. Observations of a prepared and monitored pattern of rectangles made at a ground site near Laredo, Texas confirmed that the visual performance of an astronaut in space was within the statistical range of his preflight thresholds, and that laboratory visual acuity data can be combined with environmental optical data to predict correctly man's limiting visual capability to discriminate small objects on the surface of the earth in daytime. Author

N66-18012*# National Aeronautics and Space Administration. Manned Spacecraft Center, Houston, Tex.
EXPERIMENT M-1, CARDIOVASCULAR CONDITIONING
Lawrence F. Dietlein and William V. Judy *In* NASA, Washington Manned Space-Flight Expt.: Gemini V Mission [1966] p 75–99 refs (See N66-18006 08-34) CFSTI: HC $5.00/MF $1.25

Intermittent venous occlusion of the extremities of man, during weightlessness simulation studies, has been demonstrated to be effective in preventing or mitigating the orthostatic hypotension observed following such simulations. A similar preventive measure was employed on the pilot of Gemini V with a view to determining the efficacy of pulsatile leg cuffs in preventing or lessening the orthostatic hypotension observed following previous space flights. Unfortunately, the cuff device was operative continuously during only the first 4 days of the 8-day mission. Postflight tilt-table responses of the command pilot and the pilot were considerably different, but the data cannot be construed as a conclusive demonstration that the observed differences were the result of the action of the pulsatile cuffs. The differences in the tilt responses of the Gemini V flight crew may be only experimentation. More data shall be required before a judgment can be rendered as to the efficacy of the pulsatile-leg-cuff technique in lessening postflight postural or orthostatic hypotension. Author

N66-18013*# National Aeronautics and Space Administration. Manned Spacecraft Center, Houston, Tex.
EXPERIMENT M-3, IN-FLIGHT EXERCISER
Lawrence F. Dietlein and Rita M. Rapp *In* NASA, Washington Manned Space-Flight Expt.: Gemini V Mission [1966] p 101–108 (See N66-18006 08-34) CFSTI: HC $5.00/MF $1.25

The in-flight exerciser experiment was conducted to evaluate daily the general physical condition of the Gemini V flight crew with an increase in time under conditions of space flight. The basis of this evaluation was the response of the cardiovascular system (pulse rate) to a calibrated workload. Using mild exercise as a provocative stimulus, no significant decrement in the physical condition of either of the two astronauts could be detected during the Gemini V mission. The rate of return of the pulse rate to pre-exercise levels, following in-flight exercise periods, was essentially the same as that observed during pre-flight baseline studies. The exercise device, the operating procedure, and results are discussed. R.N.A.

N66-18014* National Aeronautics and Space Administration. Manned Spacecraft Center, Houston, Tex.
EXPERIMENT M-6, BONE DEMINERALIZATION
Pauline B. Mack (Nelda Childers Stark Lab. For Human Nutr. Res.), George P. Vose (Texas Women's Univ.), Fred B. Vogt, and Paul A. La Chance (NASA. Manned Spacecraft Center, Houston) *In* NASA, Washington Manned Space-Flight Expt.: Gemini V Mission [1966] p 109–128 refs (See N66-18006 08-34) CFSTI: HC $5.00/MF $1.25

To determine the effect of prolonged weightlessness and immobilization on the skeletal system, a bone demineralization study was conducted on both the primary and backup crews of the Gemini V mission using the radiographic bone densitometry method. Losses in X-ray absorbence between radiographs made immediately preflight and postflight at the conventional os calcis tracing path were 15.1% in the command pilot and 8.2% in the pilot. When the immediate postflight value was compared with the average of the four preflight values the losses were 19.3% for the command pilot and 9.0% for the pilot. Losses in X-ray wedge mass equivalency in the distal radius were −25.3% and −22.3% for the command pilot and pilot, respectively. In the talus of the left foot there was a 13.2% decrease in the command pilot and a 9.8% decrease in the pilot. Although bone

mass losses in the 8-day Gemini V flight were greater than in the 4-day Gemini IV flight, the information is insufficient to conclude that the losses tend to progress linearly with time, or whether a form of physiological adaptation may occur in longer space flights. R.N.A.

N66-18015* Naval School of Aviation Medicine, Pensacola, Fla.

EXPERIMENT M-9, HUMAN OTOLITH

A. Graybiel *In* NASA, Washington Manned Space-Flight Expts.: Gemini V Mission [1966] p 129–140 refs (See N66-18006 08-34) CFSTI: HC $5.00/MF $1.25

An experiment is described which was conducted to determine the ability of astronauts to estimate horizontality with reference to the spacecraft in the absence of visual and primary gravitational cues, and to determine the possible effect of prolonged weightlessness on otolith function. Egocentric visual localization of the horizontal was the test chosen to measure horizontality. The test is based on the observation that when a person is tilted to the right or left, his eyes tend to rotate in the opposite direction. Preflight and postflight otolith function was measured by means of ocular counterrolling. This test determines whether prolonged physiological deafferentation of the otolith apparatus changes in its sensitivity of response. The equipment, procedures, and results are described. R.N.A.

N66-18028# Joint Publications Research Service, Washington, D. C.

PROBLEMS OF WEIGHTLESSNESS FOR SPACE MEDICINE

L. Kakurin 9 Feb. 1966 9 p Transl. into ENGLISH from Med. Gazeta (Moscow), 7 Dec. 1965 p 3
(JPRS-34064; TT-66-30506) CFSTI: $1.00

The genesis and prophylaxis of various circulatory disorders observed in both animals and humans after the completion of space flights are described. Lowered hydrostatic blood pressure, muscular activity limitation, and the absence of tone support are discussed. L.S.

N66-18036# Joint Publications Research Service, Washington, D. C.

PROBLEMS OF SUSPENDED ANIMATION FOR SPACE FLIGHTS

N. Sirotin 10 Feb. 1966 6 p Transl. into ENGLISH from Krasnaya Zvezda (Moscow), 19 Dec. 1965 p 4
(JPRS-34093; TT-66-30535) CFSTI: $1.00

The possibilities of using hypothermia (artificial lowering of body temperature) for long space flight periods are discussed. Experiments conducted with naturally hibernating animals and with rabbits, dogs, and apes are described. It is indicated that an astronaut in the state of hypothermia would need a smaller quantity of oxygen, food, and water, permitting a sharp reduction of the weight of the multiton reserves needed aboard a cosmic spacecraft. In addition, the astronaut's resistance to the action of ionizing radiation, and sudden cabin decompression would be increased. L.S.

N66-18051# Joint Publications Research Service, Washington, D. C.

HEURISTICS AND CYBERNETICS

Veniamin Noyevich Pushkin 17 Feb. 1966 57 p Transl. into ENGLISH of Evristika i Kibernetika (Moscow), 1965 p 1–48
(JPRS-34182; TT-66-30623) CFSTI: $3.00

The science of cybernetics and the ultimate objective of heuristics as a division of cybernetics are discussed in detail. Heuristics is defined as that division of cybernetics whose content is the development of the methods of machine and mathematical modeling of the human method of solution of problem tasks, based on the analysis and the experimental study of this method. It is indicated that the primary output of heuristic investigation is the program which resolves a definite class of problems; and it is also concluded that the heuristic programs, their level, and their ability to resolve various problems are functions of our knowledge on how man resolves these problems. Further, it is shown that the automation of reasoning is not the sole objective of heuristics because the field of competence of heuristics includes the study of the limits of the theoretically possible, or advisable, automation of the human intellect. R.R.D.

N66-18054# Flying Personnel Research Committee, London (England).

A PHYSIOLOGICAL ASSESSMENT OF A SIMPLE CREW MASK USING A CONSTANT OXYGEN FLOW AND PROVIDING "SAFETY PRESSURE" DEVELOPED BY NORMALAIR LIMITED (OP.7750)

A. W. Cresswell and J. Ernsting Jun. 1964 37 p refs
(FPRC/Memo-207) CFSTI: HC $2.00/MF $0.50

The performance of an oxygen system developed for use by the crew of an executive jet aircraft was evaluated. This system uses a continuous flow of oxygen, a fixed capacity reservoir, and provides a form of safety pressure. Generally, the equipment provided adequate protection against hypoxia in the seated subject at altitudes up to 40,000 feet. At 35,000 feet, the safety pressure mechanism prevented hypoxia from occurring in the presence of a relatively large mask leak. It is indicated that certain modifications are required before the equipment could be recommended for use at high altitudes. Such improvements include improving the re-seating properties of the air inlet valve, increasing the capacity of the reservoir tube to one litre, increasing the flow given at the low flow setting, and decreasing the resistance generated by the expiratory valve at high flows. It was also found that the pressure controller used in this system did not respond rapidly following a rapid decompression; therefore, it was concluded that the complete system does not provide adequate protection following a sudden loss of cabin pressure when the final altitude exceeds 25,000 feet. R.R.D.

N66-18055# Flying Personnel Research Committee, London (England).

THE PHYSIOLOGICAL EVALUATION OF THE FLIGHT CREW OXYGEN EQUIPMENT DEVELOPED BY WALTER KIDDE COMPANY LIMITED FOR THE CIVIL (B.O.A.C.) VC 10 AIRCRAFT

A. W. Cresswell Jun. 1964 34 p refs
(FPRC/Memo-208) CFSTI: HC $2.00/MF $0.50

The performance of the oxygen equipment developed for the VC 10 aircraft was investigated. This equipment, which embodies the principle of the pressure economizer, consists of: (1) a control unit which provides a metered flow of oxygen that increases with altitude up to 20,000 feet, and automatically provides an unrestricted flow of oxygen above 20,000 feet; (2) a narrow bore hose which forms the pressure resevoir; and (3) a mask where a miniature Robertshaw-Fulton regulator, an air inlet valve, and an outlet valve are mounted. It is indicated that the system performance was satisfactory and provided an adequate level of oxygenation with a low resistance to inspiration. However, it is reported that certain features of the equipment were unsatisfactory. The control unit exhibited instability, and the outlet valve imposed a high resistance to expiration and

was under-compensated. Further, it is pointed out that the mode of operation of the pressure closing valve on the air inlet should be modified so that it is only closed at high regulator supply hose pressures. Other modifications of the system are suggested, such as its ability to provide safety pressures when set to deliver 100% oxygen and the increase of positive breathing pressures delivered above 40,000 feet. R.R.D.

N66-18064# Joint Publications Research Service, Washington, D. C.

PHILOSOPHICAL SPECULATIONS CONCERNING LIFE ON EARTH AND IN OUTER SPACE

23 Feb. 1966 27 p Transl. into ENGLISH from Priroda (Moscow), no. 11, 1965 p 88–101

(JPRS-34259; TT-66-30700) CFSTI: $1.00

Two articles on the present content and concept of life on Earth, and the cosmos and intelligent creatures are presented. It is pointed out that the habitation of planets and life in the cosmos is of great interest to specialists in various scientific fields. Definitions of life are discussed, as well as the possibilities of the existence of civilizations in other planets which are not making themselves known to us. R.R.D.

N66-18068*# Spacelabs, Inc., Van Nuys, Calif.

BIO-GRID SYSTEM Final Report

C. H. Stroud 31 May 1965 30 p refs

(Contract NAS4-566)

(NASA-CR-70532; SR-65-1020) CFSTI: HC $2.00/MF $0.50 CSCL 06B

Theoretical and experimental studies were conducted to indicate the feasibility of multiple bio-electrode arrays. Multiple sensor arrays picked up unanticipated large endosomatic galvanic skin response signal levels during body movement, appreciably distorting bio-potential signals at the frequency and amplitude spectrum equivalent to the electrocardiogram. Author

N66-18070# Institut National de Recherche Agronomique, Dijon (France).

COMPARISON OF THE EFFECTS OF VARIOUS MUTAGENIC SUBSTANCES BY STUDYING THE MUTAGENESIS OF SOME TYPICAL PLANTS [COMPARAISON DES EFFETS DE DIFFERENTS AGENTS MUTAGENES PAR L'ETUDE DE LA MUTAGENESE DE QUELQUES PLANTES TYPES]

P. Dommergues, J. Gillot, H. Touvin, R. Bodergat, and M. Le Couviour Brussels, EURATOM, Dec. 1965 25 p In FRENCH; ENGLISH summary

(EUR-2546.f) CFSTI: HC $1.00/MF $0.50

The laboratory continued analyzing the stability of chimaeras isolated from different varieties of fruit-trees, also exploring their genetic structure by re-treating with gamma radiation. The stability and genetic homogeneity of certain chimaeras were confirmed. As regards rose-trees, the experiments show that during the first three years after treatment, 90% of the chimaeras are found on the treated clone. A study of the stability of the red chimaeras obtained by irradiating the WHITE-SIM variety of carnation showed that two successive clonings were needed for uniform isolation of deep tissues. With sexually-reproducing plants, the laboratory effected a classification of wheat chlorophyll mutants, based on the evolution versus time of the mutant phenotype and on a number of pigment analyses. Studies of correlations between mutagenesis, organogenesis and precocity were carried out on wheats of different ploidies. The experiments show that sterility is increasingly pronounced as the ploidy level drops, and chlorophyll mutations increase in number with the drop in the ploidy level. This experiment furthermore demonstrates that a correlation exists between the mutation rates and precocity. Author

N66-18072# Centraal Instituut voor Voedingsonderzoek TNO, Zeist (Netherlands).

THE INFLUENCE OF 1 1/2 YEARS OF STORAGE ON THE NUTRITIONAL VALUE OF CANNED MIXED FOODS [DE INVLOED VAN 1 1/2 JAAR OPSLAG OP DE VOEDINGSWAARDE VAN GEMENGDE SPIJS IN BLIK]

E. M. Hellendoorn, L. P. van der Mijll Dekker, A. P. de Groot, and P. Slump Jan. 1966 16 p In DUTCH

(R-2089; TDCK-44428) CFSTI: HC $1.00/MF $0.50

To determine the vitamin content, and the nutritional value and amino acid composition of the egg white, six samples of canned mixed foods were opened after 1-1/2 years of storage at room temperature. The vitamin A and C content was found to be zero, although vitamins B_1, B_2, B_6, B_{12} and choline showed little reduction. Reductions in pantothenic acid and inositol varied. In some products a higher percentage of vitamin E and folic acid was noted both directly after sterilization and after storage; in others, a reduction was found. The actual egg white consumption and digestion was lowered in all samples; a smaller biological value is believed to be partly responsible for reduction in the digestion. It is pointed out that the reduced biological value of the egg white cannot be explained by the lowering of the lysine content and/or by amino acids, and further research in this area is recommended. Transl. by J.O.

N66-18088*# IIT Research Inst., Chicago, Ill.

LIFE IN EXTRATERRESTRIAL ENVIRONMENTS Quarterly Status Report No. 4, 15 Nov. 1965–15 Feb. 1966

Charles A. Hagen [1966] 20 p refs

(Contract NASr-22)

(NASA-CR-70524; IITRI-L6023-4) CFSTI: HC $1.00/MF $0.50 CSCL 06F

A summary of results from the last period are presented. These data show that *B. cereus* spores germinate with subsequent vegetative cell growth in a simulated Martian environment devoid of oxygen, but they require oxygen for sporulation. Recent data indicate that *B. cereus* and *B. subtilis* can sustain an ecological niche in a simulated environment modified by 8 to 10% moisture and an oxygen partial pressure of 15 mm of Hg. The Martian environment was not lethal to heat treated spores of *B. cereus*. The inhibition of *B. cereus* and *B. subtilis* spore germination by reduced barometric pressures simulating recent estimates of the environment of Mars is being reexamined in terms of soil pH and particle size. R.N.A.

N66-18094# Joint Publications Research Service, Washington, D. C.

INTERNATIONAL SYMPOSIUM ON PROBLEMS CONCERNING THE USE OF DEEP HYPOTHERMIA IN THE TREATMENT OF TERMINAL STATES

T. V. Titova 2 Feb. 1966 10 p Transl. into ENGLISH from Vestn. Khirurg. (Leningrad), v. 95, no. 11, 1965 p 125–127 Symp. held in Moscow, 15–19 Sep. 1964

(JPRS-33971; TT-66-30414) CFSTI: $1.00

The proceedings of a conference on problems concerning the use of deep hypothermia in treating terminal states are presented. The symposium discussed problems of reanimatology, biological aspects of deep hypothermia, and clinical and experimental uses of hypothermia. R.N.A.

N66-18103# Cekmece Nuclear Research Center, Istanbul (Turkey).
THE EFFECT OF TRITIATED THYMIDINE AND GAMMA IRRADIATION ON THE MORTALITY OF DROSOPHILA MELANOGASTER LARVAE
Esin Kent Sep. 1964 15 p refs Presented at the 3d UN Intern. Conf. on the Peaceful Uses of Atomic Energy, Geneva, 31 Aug.–9 Sep. 1964
(CNAEM-16) CFSTI: HC $1.00/MF $0.50

This study found that orally administered tritiated thymidine and total body gamma irradiation from Co^{60} increased the mortality rate of 72-hour old Drosophila melanogaster larvae when applied simultaneously at certain ratios to each other. When either was given to the larvae without the accompaniment of the other, a comparable mortality rate did not occur. The combined effect of these two factors was higher than their additive effect and Co^{60} irradiation was more influential in producing this effect. The reasons for these phenomena are discussed. R.N.A.

N66-18131# Deutsche Versuchsanstalt für Luft- und Raumfahrt, Bad Godesberg (West Germany).
REGENERATION PROCESSES AND ORGANIC CHANGES FOLLOWING SHOCK WAVES [REGENERATIONSVORGANGE BEI ORGANVERANDERUNGEN NACH DRUKWELLENSTOSS]
O. Wünsche and G. Scheele Dec. 1965 33 p refs In GERMAN; ENGLISH summary
(DVL-481; DLR-FB-65-60) CFSTI: HC $2.00/MF $0.50

Earlier animal experiments on the biological effects of shock waves indicated the need for a more definitive classification scheme than the usual division of survival and death. Therefore, the former class was broken down into long term survival and short term survival. This improved scheme caused a shift in interest from mere survival to functional or regenerative processes during the survival period. It is pointed out that the regenerative process observations may serve as a basis for clinical–therapeutical considerations. Furthermore, the improved classification aids in distinguishing genuine shock wave effects from combination damages. Transl. by D.T.

N66-18133# Aktiebolaget Atomenergi, Stockholm (Sweden).
REPORT ON THE PERSONNEL DOSIMETRY AT AB ATOMENERGI DURING 1964
K. A. Edvardsson Jan. 1966 22 p refs
(AE-211) CFSTI: HC $1.00/MF $0.50

No doses exceeding the recommendations of ICRP were reported. The sum of the reported external total body doses during the year was for 51.5 manrem which, distributed over the whole company personnel, corresponds to an average dose of about 35 mrem per year and person or less than 1% of the maximum permissible dose. Thirty-one thousand four hundred gamma films and 5800 neutron films were evaluated. The films were changed every month. Urine analyses numbered 2731 and whole body measurements 485. A comparison is made between dose distributions at AB Atomenergi and at institutions in other countries. The fraction of all personnel carrying dosimeters and exposed to more than a nominal dose seems generally to have been less than 10–20%. Author

N66-18146# European Atomic Energy Community, Brussels (Belgium).
THE RELATIONS BETWEEN LACTATE PRODUCTION RESPIRATION AND NUCLEAR DAMAGE IN IRRADIATED RAT THYMOCYTES
J. F. Whitfield, H. Brohee, and T. Youdale Dec. 1965 16 p refs
(EUR-2623.e) CFSTI: HC $1.00/MF $0.50

Respiratory inhibitors prevent the postirradiation disappearance of nuclear structure in rat thymocytes. This effect cannot be ascribed to the compensatory stimulation of lactate production since high concentrations of nicotinamide which prevent nuclear changes inhibit both respiration and the radiation-induced burst of pyruvate and lactate production. The effect cannot be ascribed to the inhibition of respiration per se since certain concentrations of 2,4 dinitrophenol stimulate respiration, but strongly inhibit the disappearance of nuclear structure. A possible mechanism which can fully explain these observations is discussed. Author

N66-18147# Cekmece Nuclear Research Center, Istanbul (Turkey).
DISCUSSION ON THE POSSIBILITIES OF PRODUCING MUTANTS RESISTANT TO *PERONOSPORA TABACINA* (BLUE MOLD DISEASE) OF TOBACCO PLANTS BY SEED TREATMENT WITH IONIZING RADIATION
Emine Polar Nov. 1964 22 p refs
(CNAEM-18) CFSTI: HC $1.00/MF $0.50

A literature survey concerned with the possibility of obtaining disease resistant tobacco plants by producing mutants treated with ionizing radiation is presented. The survey shows that a decision about the minimum dose that should be given tobacco seeds can be facilitated by an estimation of the radiosensitivity of the seeds, from the knowledge of their biological trait and chemical composition. The literature has some controversy as to whether there is a differential efficiency when using neutrons, X-rays, and gamma rays. In determining radiation dosage, great importance should be given to work on seeds of similar states as their ontogenetic development, dormancy, moisture, and oxygen content. Environmental variables like time between irradiation and germination, storage conditions and temperature before and after irradiation, chemical composition of the soil, and planting technique should be carefully recorded. C.T.C.

N66-18157*# Battelle-Northwest, Richland, Wash. Pacific Northwest Lab.
SNPO AND SNAP BIOLOGICAL STUDIES Summary Technical Report
R. C. Thompson 3 Jan. 1966 22 p
(Contract AT(45-1)-1830)
(NASA-CR-70520; BNWL-182) CFSTI: HC $1.00/MF $0.50
CSCL 06R

Several separate investigations involving biological radiation exposure studies are described. These include large particle inhalation studies, miniature swine intragastric and skin exposure studies, ingested particle studies in rats, plutonium-238 SNAP fuel ingestion by miniature swine, and the solubility kinetics of particles. Among the conclusions are that particles in the 5 to 30 μ size range are respirable (by dogs) and cannot be ignored in evaluations of inhalation hazards. The 100 to 1000 μ particles may be held up in the gastrointestinal tract (of pigs and rats) for periods of many days. Particles within the contents of the lumen of the gastrointestinal tract (of rats) cannot be assumed to randomly distributed. In a specific instance, the internal deposition of Pu-238 (in a pig) following ingestion

of a massive dose of PuO_2 SNAP fuel particles was quite insignificant. There was an indication that the most hazardous aspect of these particles may be the small amount of very fine dust associated with them. C.T.C.

N66-18161*# Aerospace Medical Div. Aerospace Medical Research Labs. (6570th), Wright-Patterson AFB, Ohio.
[RESEARCH ON USE OF COMPUTERS FOR HANDLING ADVANCED SYSTEMS HUMAN FACTORS TASK DATA] Quarterly Status Report, 1 Oct.–31 Dec. 1965
Lawrence E. Reed 18 Feb. 1966 6 p
(NASA Order R-115)
(NASA-CR-70513) CFSTI: HC $1.00/MF $0.50 CSCL 05E

A brief status report is given of a program involving research on the use of computers for handling advanced systems human factors task data. This includes mention of various subcontractor reports, and a discussion of concentrated work areas. C.T.C.

N66-18163*# California Univ., Berkeley. Space Sciences Lab.
ENZYME ACTIVITY IN TERRESTRIAL SOIL IN RELATION TO EXPLORATION OF THE MARTIAN SURFACE Third Semiannual Progress Report, 1 Jul.–31 Dec. 1965
A. D. Mc Laren and J. J. Skujins 14 Jan. 1966 148 p refs
(Grant NsG-704)
(NASA-CR-70058) CFSTI: HC $4.00/MF $1.00 CSCL 06C

Qualitative and quantitative tests are developed for various enzyme activities in soil and the most sensitive of these are adapted to procedures compatible with telemetry from Mars probes. In addition, enzyme reactions in environments of limited moisture are elucidated. A review is given of presently available information on enzymatic reactions in terrestrial soil, with emphasis placed on the characterization of free, extracellular enzymes and the metabolic activities of soil microorganisms. An experimental evaluation was made of urea as a possible substrate for the detection of catalytic soil breakdown in a Martian environment. Relative to this a new method for the detection of phosphatase activity was developed. A study of surface effects in the hydrolysis of insoluble chitin by absorbed chitinase was initiated to investigate some of the factors influencing reactions at interfaces. C.T.C.

N66-18214# United Kingdom Atomic Energy Authority, Harwell (England). Health Physics and Medical Div.
THE SLOW NEUTRON CALIBRATION OF FILM AND OTHER GAMMA DOSIMETERS
S. J. Boot and J. A. Dennis Aug. 1965 17 p refs
(AERE-R-4960) HMSO: 3s

The slow neutron calibration of the film dosimeter used at A.E.R.E. Harwell was determined for exposures in free air and on the surface of a tissue-equivalent chest phantom. The slow neutron and gamma flux determinations associated with the film measurements are described in detail. Equations are derived from which neutron and gamma doses may be found from film densities and the errors involved are given. Slow neutron and gamma flux reflection caused by the phantom is discussed with reference to results of depth dose calculations.
Author (NSA)

N66-18287# Brookhaven National Lab., Upton, N. Y. Medical Research Center.
GRANULOCYTOPOIESIS
E. P. Cronkite and T. M. Fliender [1964] 43 p refs Submitted for Publication
(Contract AT(30-2)-GEN-16)
(BNL-7955) CFSTI: HC $2.00/MF $0.50

Autoradiographic methods, using ^{3}H-thymidine and ^{32}PDF as tracers, were used in studies of granulocytopoiesis in man. Data are presented on the granulocytic cell renewal system, time parameters in granulocytic cell renewal, transit times through maturation and proliferation pools, the productive capacity of the bone marrow, and the regulation of granulocytopoiesis. NSA

N66-18316*# Massachusetts Inst. of Tech., Brookline.
GLIA BIBLIOGRAPHY, 1960–1964
Margaret S. Little and Joan Morris [1965] 328 p refs Its Neurosciences Res. Program Bull., v. II, no. 6, Nov.–Dec. 1964, Suppl. I
(Grants NsG-462; NIH G-GM-10211-03; Nonr(G)-00089-64)
(NASA-CR-70631) CFSTI: HC $7.00/MF $1.75 CSCL 06P

This bibliography lists about 1100 published references to the world literature on glia cells. It covers publications on glial development, structure, function, pathology and "ultrastructure". G.G.

N66-18318*# Naval School of Aviation Medicine, Pensacola, Fla. Naval Aerospace Medical Inst.
CONDUCT RESEARCH ON THE EFFECT OF VERY STRONG FIELDS AND OF MAGNETIC FIELD FREE ENVIRONMENTS ON MAN AND ANIMALS Progress Report, 1 Nov. 1965–31 Jan. 1966
D. E. Beischer [1966] 7 p ref
(NASA Order R-39)
(NASA-CR-70632) CFSTI: HC $1.00/MF $0.50 CSCL 06R

Mitosis in sea urchin eggs was retarded following exposure to magnetic fields higher than 70,000 gauss with gradients greater than 4,200 gauss/cm. The effect was strongest during the early stages of cell division. Squirrel monkeys are being trained for a complicated visual task to test their performance later on in a strong magnetic field. A number of testing methods for subjects exposed to a magnetic field-free environment are being developed. G.G.

N66-18332*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
THE EFFECTS OF HIGH LUMINANCE SOURCES UPON THE VISIBILITY OF POINT SOURCES
Richard F. Haines [1965] 14 p refs Presented at the 11th Ann. Meeting of the Am. Astronautical Soc., Chicago, 6 May 1965
(NASA-TM-X-56561) CFSTI: HC $1.00/MF $0.50 CSCL 06B

To determine if an observer could perceive a moving point source in close proximity to a source of high luminance, five highly-trained persons viewed a stimulus configuration through an artificial light pupil which provided a 10-1/2° field of view. The moving "star" was used to determine the characteristics of the luminous field gradient produced by the glare. It is shown that the angular distance, from the edge of the glare source, at which the star disappears or reappears is directly related to the luminance of the glare. Disappearance and reappearance occurs at different distances, depending upon whether the star can approach normal to a straight- or curved-line edge. Perceived shape of the glare source differs from the actual physical form under relatively high luminance conditions; and the apparent size of the glare increases with higher luminance. While variance in response was greater under conditions of higher luminance, this variance did not appear to be affected by either the shape of the glare source or the meridian of travel of the star. M.W.R.

N66-18369*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.

FURTHER NOTES ON THE CENTRE MEDIAN NUCLEUS OF LUYS

William R. Mehler [1965] 33 p refs Submitted for Publication

(NASA-TM-X-56159) CFSTI: HC $2.00/MF $0.50 CSCL 06C

Neuropathological evidence supported by consistent experimental findings in both retrograde cell and antegrade fiber degeneration studies establishes that the centre median projects primarily upon the putamen. Previous claims that there exist ascending afferent connections with the centre median are refuted. It is contended that the only significant afferent connections with the centre median originate from forebrain structures lying rostral to this nucleus. This is supported by recent demonstrations that both the globus pallidus and the precentral motor cortex project in a convergent manner upon the nucleus centre median. In the cat and monkey, terminal connections originating from the internal segment of the globus pallidus and/or the precentral motor cortex literally outline homologous nuclear regions, which, in both species, exhibit corresponding efferent projections to the putamen. These data confirm findings originally demonstrated in human neuropathological material and lend support to Schulman's hypothesis that the centre median might play a critical role in mechanisms that mediate certain dyskinesias. R.N.A.

N66-18389*# California Univ., Los Angeles. Dept. of Physiology and Anatomy.

COMPREHENSIVE SPECTRAL ANALYSIS OF HUMAN EEG GENERATORS IN POSTERIOR CEREBRAL REGIONS

D. O. Walter, J. M. Rhodes, D. Brown, and W. R. Adey [1964] 48 p refs Submitted for Publication

(Contract NAS9-1970; Grants NsG-505; PHS-NB-2501-04 AF-AFOSR-246-63)

(NASA-CR-57050) CFSTI: HC $2.00/MF $0.50 CSCL 06P

Some aspects are reported of intracerebral electric generation illuminated by a novel extension of spectral analysis. The extension consists of performing many sequential spectral analyses, and producing suggestive visual transformations of spectral intensity and strength of spectral relationship, as a function of time and frequency. These contour maps and density plots give a broad overview of the stability, fluctuation, and evolution of patterns of wave generation and propagation in the EEG. They also lead to a broadened conception of the familiar alpha wave, as well as to a clear delineation of linear and nonlinear transmission. C.T.C.

N66-18391*# Ohio State Univ., Columbus. Dept. of Physiology.

REACTION OF THE CHICK TO ONE ATMOSPHERE OF OXYGEN

Harold S. Weiss, Ronald A. Wright, and Edwin P. Hiatt [1964] 25 p refs Submitted for Publication

(Grant NsG-295)

(NASA-CR-60380) CFSTI: HC $1.00/MF $0.50 CSCL 06P

A detailed description is given of an experiment to determine the effect on chickens of 100% oxygen at atmospheric pressure. The experimental procedures are discussed, as well as the apparatus and equipment used in the investigation. It was found that the chick between the ages of two and seven weeks is markedly resistant to the toxic effects of one atm. O_2. Continuous exposure for as long as four weeks caused neither death, obvious morbidity, nor any signs of pulmonary damage, on gross autopsy. The hyperoxia did have some adverse effects: primarily reducing the growth rate from 1/4 to 3/4 of normal; reducing feed intake per unit body weight to 3/4 of normal; slowing respiratory rate by 31%; decreasing erythrocytes, hemoglobin, and hematocrit by 9% to 12%; and causing histological changes in the lungs. Arterial O_2 tensions were elevated over 300 mm Hg, but arterial PCO_2 and blood pH were unaffected. C.T.C.

N66-18432*# National Aeronautics and Space Administration. Manned Spacecraft Center, Houston, Tex.

EFFECTS OF LOW FREQUENCY PRESSURE FLUCTUATIONS ON HUMAN SUBJECTS

Burrell O. French, Robert O. Mc Brayer, W. E. Fedderson, Gerard J. Pesman, and John Billingham Washington, NASA, Mar. 1966 29 p refs

(NASA-TN-D-3323) CFSTI: HC $0.35/MF $0.50 CSCL 06S

Twenty human subjects were exposed to sinusoidal pressure fluctuations which corresponded to sound pressure levels from 119 to 144 decibels at frequencies from 2 to 12 cycles per second, and their psychophysiological responses were measured. A description of the test apparatus, a piston-cylinder arrangement which produced the pressure fluctuations and a test chamber which isolated the subjects from the laboratory, is included as an appendix. Psychophysiological monitoring techniques and instrumentation consisted of audiometry, electronystagmography, electrocardiography, impedance pneumography, and performance and subjective responses. The test results show that repeated exposure to 137 to 141 decibels produced temporary threshold shifts of 10 to 22 decibels in the 3000 to 8000 cycles per second frequencies. Author

N66-18448*# National Aeronautics and Space Administration, Washington, D. C.

CONFERENCE ON ELEMENTARY BIOLOGICAL SYSTEMS AND ON BIOGENESIS [COLLOQUE SUR LES SYSTEMES BIOLOGIQUES ELEMENTAIRES ET LA BIOGENESE]

Jan. 1966 65 p refs Transl. into ENGLISH of abstr. of papers presented at the Conf. on Elementary Biol. Systems and on Biogenesis, Paris, 23–25 Nov. 1965

(NASA-TT-F-9863) CFSTI: HC $3.00/MF $0.75 CSCL 06C

Brief resumés of papers on elementary biological systems and biogenesis are given, including geological, physical, chemical, and philosophical aspects of the origin of life. Some papers attempt explanations of biogenesis based on metaphysical theories and speculative application of Darwin's postulates. The problems of extraterrestrial life based on meteorite studies, evolution of terrestrial atmospheric composition, electronic factors in biochemical evolution, ultrastructure of chloroplasts and mitochondria, geological factors in biogenesis, deterministic views on cosmology, etc. are covered. Author

1966
IAA ENTRIES

A66-17229 #
LIFE SUPPORT SYSTEMS AND OUTER SPACE.
John F. Foster (Battelle Memorial Institute, Columbus, Ohio).
Battelle Technical Review, vol. 15, Jan. 1966, p. 4-9. 5 refs.

Discussion of new concepts concerning the principles, capabilities, and limitations of the life-support closed cycles required for missions lasting 12 months or longer. The amounts of life-support materials required for a long mission prohibit total dependence on stored supplies; therefore "closed cycles" are needed to recover and replenish water, food, and oxygen by the reprocessing of wastes. The reprocessing of waste water containing different amounts of contaminants is discussed. Any cycling of waste products into food production is usually a part of a combination process that is intended for oxygen renewal as well as production of a supplementary food substance. The renewal of oxygen is the most pressing problem in the development of the overall life support system, because the methods for recovering oxygen from waste products are relatively complex. Several types of chemical conversion systems used to treat carbon dioxide are described. A combination oxygen-food cycle is discussed. M.F.

A66-17282 #
THE MAN-MACHINE CONFLICT IN HIGH PERFORMANCE TAC AIRCRAFT.
Gordon M. Graham (USAF, Tactical Air Command, Washington, D.C.).
(1965 Report to the Aerospace Profession; Proceedings of the Society of Experimental Test Pilots, Annual Symposium, 9th, Beverly Hills, Calif., Sept. 24, 25, 1965.)
Society of Experimental Test Pilots, Technical Review, vol. 7, no. 4, 1965, p. 180-185.

Discussion of the man-machine conflict with emphasis on the tactical fighter pilot, considering performance characteristics reaching into Mach numbers of 2.0 to 2.5, high tolerances characteristic of fighter aircraft, and rather short take-off and landing distances, but most particularly a machine equipped with a fire control system enabling rapid, accurate delivery of conventional and nuclear weapons in both the air-to-air and air-to-ground roles. It is pointed out that computers and sensors have far surpassed most expectations not only in their application but also in their reliability, but that, nevertheless, their decision-making capability cannot substitute for the human mind. M.M.

A66-17285 #
NEW MAN-MACHINE REQUIREMENTS IN DETECTION, RECOGNITION AND ACQUISITION SYSTEMS.
Harry Davis (USAF, Washington, D.C.).
(1965 Report to the Aerospace Profession; Proceedings of the Society of Experimental Test Pilots, Annual Symposium, 9th, Beverly Hills, Calif., Sept. 24, 25, 1965.)
Society of Experimental Test Pilots, Technical Review, vol. 7, no. 4, 1965, p. 198-202.

Study of devices for the detection, recognition, and acquisition of targets at different altitudes and speeds. It is noted that the ability of the human eye to quickly examine any region with high resolution has not been duplicated in the displays which have been built to date. One attempt to retain the great advantage of the eye's large field of view uses a large angle projection of the forward terrain. The image of the terrain is projected on a semi-transparent screen and focused at infinity. It is observed that the conflicting demands of longer recognition range and the need to fly low and fast can be mitigated by aided visual elements in the cockpit and that many problems in reconnaissance and in detection, recognition, and acquisition can be helped by the provision of an accurate radio navigation grid system. M.F.

A66-17458
DELAYED MORTALITY IN ADULT CHICKENS EXPOSED TO 1 ATMOSPHERE OXYGEN.
Harold S. Weiss, David L. Beckman, and Ronald A. Wright (Ohio State University, College of Medicine, Dept. of Physiology, Environmental Physiology Laboratory, Columbus, Ohio).
Nature, vol. 208, Dec. 4, 1965, p. 1003, 1004. 9 refs.
Research supported by the National Institutes of Health and NASA.

Investigation of the age dependence of the resistance exhibited by growing White Leghorn chicks to the usually lethal effects of 100% oxygen at 1 atm (OAP). Nineteen chickens, ranging in age from 8 months to 2 years, survived an average of 10 days, with no significant difference due to sex or age. This hardly compares with the absence of mortality and morbidity observed in the growing (2- to 7-week) chicks after 4 weeks in OAP; it is,however, twice the survival time usually observed for other animals. It is thought that the chicken does have an inherently high resistance to OAP, and that this resistance may be related to the chicken's specialized respiratory system. R.A.F.

A66-17460
EFFECT OF INFANTILE TREADMILL EXPERIENCE ON BODY-WEIGHT AND RESISTANCE TO EXHAUSTION IN THE RAT.
Robert A. Levitt and Wilse B. Webb (Florida, University, Gainesville, Fla.).
Nature, vol. 208, Dec. 11, 1965, p. 1128, 1129.
National Institutes of Health Grant No. MH-03881-03.

Experimental investigation of the effect of early treadmill experience on later resistance to exhaustion and of a hitherto-unnoticed weight-gain effect in the rat. It is shown that the infantile treadmill experience caused the experimental groups to fall behind the control subjects in weight and that, following treatment, the experimental subjects caught up with and by-passed the control group. It is noted that it appears that the treadmill acted as a stressor and that this acute stress during infancy was responsible for the increased growth of muscle and other tissue. It is not known whether the improved treadmill performance is indicative of a general increased resistance to stress or is a specific effect of the early treadmill experience perhaps reflecting a learning component. M.M.

A66-17615 #
THE NASA BIOSATELLITE PROGRAM.
Joseph F. Saunders, Dale W. Jenkins, and Thomas P. Dallow (NASA, Office of Space Science and Applications, Washington, D.C.).
Astronautics and Aeronautics, vol. 4, Jan. 1966, p. 48-52.

Analysis of the mission objectives for biosatellites and an explanation as to why these objectives were selected. The fundamental concept of these missions is to provide data for making precise quantitative analyses for predicting the behavior of organisms in a space environment. Of special significance is a study of weightlessness combined with radiation effects. Three missions are planned - each using two biosatellites in circular orbits inclined 33^{o} to the equator and at altitudes between 140 and 180 miles - for periods of 3, 21, and 30 days respectively. The 3-day trip will include experiments on the effects of zero gravity on gravity-dependent organisms, such as frog eggs, and its effects on plant growth. The 21-day trip includes experiments on structural, developmental, and functional patterns. The 30-day flights will test the reactions of primates. D.P.F.

A66-17656 #
EFFECTS OF LOW FREQUENCY AND INFRASONIC NOISE ON MAN.
George C. Mohr, Elizabeth Guild (USAF, Washington, D.C.), John N. Cole, and Henning E. von Gierke.
Aerospace Medicine, vol. 36, Sept. 1965, p. 817-824. 7 refs.
USAF-sponsored research; NASA defense PR T-22031-G.

Investigation of human tolerance of noise environments. Future manned space systems, with larger payloads and more powerful boosters, will generate during launch operations noise environments with maximum energy in the 1-100 cps frequency range. In order to investigate human tolerance to such environments, five noise-experienced officers were exposed for two-minute periods to high-intensity broad-band, narrow-band, and pure-tone low-frequency noise. The effects of these exposures on cardiac rhythm, hearing

threshold, visual acuity, fine motor control, spatial orientation, speech intelligibility, and subjective tolerance were observed. Exposures up to 154 db in the 1-100 cps range were achieved; the range of human exposure to infrasound was extended from 20 to 40 db above prior documented experience. Both objective and subjective responses of the subjects demonstrated that short-duration exposure to low frequency noise up to 150 db is well within human-tolerance limits. Exposures above 150 db elicited responses indicating the limiting range of subjective tolerance and that reliable performance was being approached. (Author)

A66-17657
METABOLIC RATES IN PRESSURIZED PRESSURE SUITS.
Thomas J. Harrington, David K. Edwards, III, and Edward C. Wortz (Garret Corp., AiResearch Manufacturing Co., Los Angeles, Calif.).
Aerospace Medicine, vol. 36, Sept. 1965, p. 825-830.
Contract No. NAS 9-1639.

Description of the testing of four subjects wearing a full-pressure space suit in a high-altitude chamber, at sea-level pressure and at a simulated 34,000 feet, with a suit pressurized to 3.5 psig. The subjects were exercised on a treadmill, and their metabolic rates were measured and compared with the heat-removal rates from the suit by ventilating oxygen gas at 15 cubic feet per minute flow, 40°F dew-point temperature, and 70° and 80°F dry-bulb temperature. Avenues of heat loss other than by suit-ventilation gas flow were minimized, so that a heat balance was achieved between the subjects' metabolic heats, the heat removed by the ventilation system, heat stored by the subjects, and useful work ("efficiency") accomplished by them. It was found that the gas flow was marginal for cooling at light work rates (at 180 kcal/m^2/hr) and inadequate for heavier work, in which case the subjects apparently stored the excess heat. The metabolic rates observed with the pressurized suits were quite high, and represented approximately twice the rates observed in experimentation with unpressurized suits. (Author)

A66-17658
SYSTEM DESIGN COSTS AND CONSIDERATIONS AS A FUNCTION OF MAINTAINING SPACE CREW PHYSICAL FITNESS.
I. Streimer, A. J. Getzkin, and B. Wendrow (North American Aviation, Inc., Space and Information Systems Div., Downey; San Fernando Valley State College, Northridge, Calif.).
Aerospace Medicine, vol. 36, Sept. 1965, p. 830-833. 19 refs.

Consideration of the engineering costs imposed by exercise programs upon space system design. The implications of their impact upon future systems are discussed, and the possibilities of the utilization of pharmacological techniques alone or in conjunction with exercise programs as maintainers of space crew physical fitness are surveyed. (Author)

A66-17659
OBJECTIVE EVALUATION BY DIGITAL COMPUTERS OF THE HYPOXIC STRESS REACTIONS IN MAN AND OF THE METHODS USED.
J. Dvorak, J. Andel, J. Horak, J. Krecek, and B. Filsakova (Institute of Aviation Medicine, Prague, Czechoslovakia).
Aerospace Medicine, vol. 36, Sept. 1965, p. 840-842.

Description of a computational analysis that demonstrated the possibility of expressing the weights of the methods used by the calculation of certain coefficients; these were changed according to the number and combination of methods. This procedure evidenced that a certain set of methods, with a relatively smaller deviation from the ideal value and the lowest probable error, is easily arranged. In this way, it is noted, it is possible to characterize the best combination of parameters to be followed, the sufficient number of methods, the consequences of omission of certain methods in future work, and/or which of two or more combinations of methods is to be preferred. (Author)

A66-17660 #
NEUROLOGIC ADAPTATIONS AND AUDIOGENIC RESPONSES IN MICE EXPOSED TO A CHRONIC 2X GRAVITY FIELD.
Julian P. Cooke and Richard W. Bancroft (USAF, Systems Command, Aerospace Medical Div., School of Aerospace Medicine, Brooks AFB, Tex.).
Aerospace Medicine, vol. 36, Sept. 1965, p. 843-850. 55 refs.
USAF-sponsored research.

Study that concludes, from the experimental data presented, that chronic $2g_E$-exposure of young mice for 10 or 11 days has resulted in adaptations that affect neurological responses in some animals. It is also concluded that these adaptive changes are not necessarily detrimental to the organism. These conclusions are based upon both a reduction in the incidence and severity of audiogenic seizure following acceleration. It is suggested that the development of a more efficient circulatory system during acceleration may be associated with this seizure reduction. Other adaptations include alterations in the growth pattern, changes in the percentage ratio of organ/body weight, and hemological alterations that are indicative of stress response. These findings, it is noted, do not rule out readaptations of the balance or hearing mechanism, or physiological alterations that may result. Whether any like adaptations result in man during prolonged exposure to acceleration in space flight remains to be learned; the lack of an expected increase of seizure, and in fact an actual decrease in some animals is considered to be very encouraging. This study purports to give positive evidence that indicates an ability of higher living organisms to tolerate and adjust to altered gravity fields, just so long as the intensity of acceleration is not great enough to cause immediate mechanical trauma and circulatory disorders of a major proportion. (Author)

A66-17661
INFLUENCE BREATHING CARBON DIOXIDE UPON SOME ALTERATIONS INDUCED BY HYPOXIA.
Maurice V. Strumza (Paris, University, Faculty of Medicine, Laboratory of Aviation Medicine, Paris, France).
Aerospace Medicine, vol. 36, Sept. 1965, p. 850-854. 7 refs.
Research supported by the Direction des Recherches et Moyens d'Essais.

Presentation of tests performed on 114 young healthy volunteers in two parallel trials, for ascertaining the correction of the alterations induced by mild hypoxia on the psychologic and psychomotor performances, by addition of carbon dioxide to the artificial atmosphere. The intellectual efficiency tests and the estimate of the metabolic cost of a task showed that: (1) the correction of the alterations bound to mild hypoxia, PIO_2 115 mm and PIO_2 110 mm Hg, seems to be better with $PICO_2$ 15 mm Hg than with $PICO_2$ 7 mm Hg; (2) the alterations resulting from inhalation of gas mixtures, with lower PO_2, 100 mm Hg, is better corrected with PCO_2 9 mm Hg than with PCO_2 15 mm Hg. At the lower concentration of carbon dioxide, the subjects were disturbed and hyperventilation was seen. These conclusions are considered valid for experiments of two-hour duration. (Author)

A66-17662
INFLUENCE OF EYE LID MOVEMENT UPON ELECTRO-OCULOGRAPHIC RECORDING OF VERTICAL EYE MOVEMENTS.
W. Barry and G. Melvill Jones (Defence Research Board, Aviation Medical Research Unit, Ottawa; McGill University, Dept. of Physiology, Montreal, Canada).
Aerospace Medicine, vol. 36, Sept. 1965, p. 855-858.
Defence Research Board Grants No. 9910-37; No. 9310-92.

Analysis of an investigation into the cause of an EOG artifact noted during vertical saccadic eye movements. During the course of experiments, records of eye movements were obtained simultaneously from dc electro-oculography and a movie photographic method in response to intermittent vertical saccadic changes in visual fixation. The artifact was found to run the same time course as the upper-eyelid movement and, it is noted, is probably directly attributable to this. An argument is advanced suggesting that changes in the relative position of the eyelid and eyeball are responsible for the artifact, and a simplified model of the electrical setup, by which the eyeball, lids, and electrodes might function, is presented. (Author)

A66-17663 #
OBSERVATIONS ON RATS EXPOSED TO A SPACE CABIN ATMOSPHERE FOR TWO WEEKS.
Philip Felig (USAF, Systems Command, Aerospace Medical Div., Aerospace Medical Research Laboratories, Wright-Patterson AFB, Ohio).
(Aerospace Medical Association, Annual Meeting, 36th, New York, N.Y., Apr. 26-29, 1965, Paper.)
Aerospace Medicine, vol. 36, Sept. 1965, p. 858-863. 28 refs.
NASA Defense PR R-87.

Study of the effects of breathing 98% oxygen at 258 mm Hg in male albino rats maintained for two weeks in a closed-system environmental chamber. Three separate experiments were conducted, in each of which temperature, humidity, and CO_2 concentration were carefully regulated. Control animals were maintained in identical cages in room air. All but one of the 140 rats exposed to oxygen survived for a mortality rate of less than 1% and a total exposure time of 1,960 rat-days. No significant differences as compared to controls were noted in growth rates or in pulmonary, hepatic, renal, and thyroid function. A very modest reduction in hematocrit observed in each experiment may, it is noted, be attributable to a mild suppression of erythropoiesis. (Author)

A66-17664
USAF WHOLE BODY GAMMA SPECTROMETRY.
Alvin M. Burner, Richard E. Benson, and Robert G. Thomas (USAF, Logistics Command, Radiological Health Laboratory, Wright-Patterson AFB, Ohio).
(Aerospace Medical Association, Annual Meeting, 36th, New York, N.Y., Apr. 26-29, 1965, Paper.)
Aerospace Medicine, vol. 36, Sept. 1965, p. 864-868.

Discussion of the importance and application of whole-body gamma spectrometry in support of the Air Force aerospace mission. The design and initial operation of the facility established for this purpose - at Wright-Patterson AFB, Ohio - are described. In particular, experience concerning background activity, which has been observed to vary by as much as 40% during an eight-hour period, is discussed. Such variations, it is noted, pose a serious problem for accurate calibration and measurement of in vivo radioactivity. Studies undertaken to identify the sources of the variation in background activity and actions taken to limit the magnitude of the variation are reported. Techniques employed for calibration of the whole body counter are emphasized. Studies involving human subjects and phantoms, to demonstrate the influence of factors such as body size and changing distribution of nuclides within the body upon in vivo counting efficiency, are also described. (Author)

A66-17666
SOVIET HIGH ALTITUDE PRESSURE SUIT DEVELOPMENT, 1934-1955.
Charles L. Wilson (USAF, Systems Command, Directorate of Bioastronautics, Andrews AFB, Washington, D.C.).
(Aerospace Medical Association, Annual Meeting, 36th, New York, Apr. 26-29, 1965, Paper.)
Aerospace Medicine, vol. 36, Sept. 1965, p. 874-877. 11 refs.

Evaluation of Soviet high-altitude pressure-suit development, testing, and use between 1934-1955. It is noted that, beginning with a crude prototype suit in 1934, the Soviet pressure-suit program quickly expanded into an exceptionally well-organized, staffed, and funded effort. Their accomplishments included a thorough review of world literature on high-altitude physiology, aircrew requirements for stratospheric flying, and foreign technological developments; design of many suits; combined low-temperature, low-pressure, and flight tests; electrically heated face plates and clothing; reliable closed-circuit aircraft and escape environmental control systems. Soviet aviation medicine specialists, it is stated, enjoyed long, continuous assignment to research problems, with the notable exception of the years 1943-1946. Translated open-source literature is abundant; several superb reports are doctoral theses. All evidence, it is maintained, suggests that Soviet life scientists have been earnest and sincere in striving to provide adequate personal equipment for their aircrews. (Author)

A66-17712 #
TRAINING TO DEVELOP VISUAL HABIT PATTERNS AS A METHOD OF AVOIDING MID-AIR COLLISIONS.
IN: INTERNATIONAL AIR TRANSPORT ASSOCIATION, TECHNICAL CONFERENCE, 16TH, MIAMI, FLA., APRIL 22-30, 1965, WORKING PAPERS. VOLUME 1 (Nos. 1-70). [A66-17667 07-21]
Montreal, International Air Transport Association, 1965. 15 p.

Experimental investigation in which 30 Marine A-4 pilots were given 8 carefully designed time-sharing training sessions in a simple, generalized visual flight simulator; their performance, in the highly specific A4 operational flight trainer equipped with a visual display, was then compared with a control group. Results indicated an improved ability to detect simulated mid-air collision hazards without compromising performance in the other flight tasks. Such training is recommended as an aid in reducing the mid-air collision hazard. (Author)

A66-17732
MAGNITUDE ESTIMATION OF LOUDNESS.
H. McRobert, M. E. Bryan, and W. Tempest (Liverpool, University, Dept. of Building Science, Acoustics Research Unit, Liverpool, England).
Journal of Sound and Vibration, vol. 2, Oct. 1965, p. 391-401. 24 refs.

Study of a form of magnitude estimation that has been used to obtain observers' estimates of loudness increase for fifteen pairs of tones at 1000 c/sec. The method was chosen to minimize errors due to bias and context effects. For each pair of tones about twenty-five estimates were obtained, and the mean estimates of the groups can be related to the intensity differences by the equation $\log_{10} S = 0.21 + 0.21 P$, where S = mean estimate and P = difference in intensity levels (db). This result is of a different form from the "sone" scale. The presence of the constant term implies that observers' estimates of loudness increase are not consistent with the hypothesis that loudness has an absolute psychological magnitude. (Author)

A66-18578
ASTRONAUT SELECTION AND TRAINING.
Warren J. North (NASA, Manned Spacecraft Center, Flight Crew Support Div., Houston, Tex.).
(Conference on Civilian and Military Uses of Aerospace, New York, N.Y., Jan. 11-14, 1965, Paper.)
New York Academy of Sciences, Annals, vol. 134, Nov. 22, 1965, p. 366-375.

Review of the astronaut selection and crew preparation procedures for the Gemini and Apollo programs. While engineering pilots are being assigned to fly the early manned space missions, astronaut selection criteria for the later Apollo flights are being broadened to include a wider variety of scientific disciplines. Simulation procedures are reviewed, including those for the Gemini mission, the Gemini translation and docking maneuvers, and the Apollo command and lunar excursion modules. A dynamic crew-procedures simulator and a lunar landing research vehicle are described. P.K.

A66-18579
AEROSPACE PILOT TRAINING AND SELECTION.
Norris Jay Hanks (USAF, Systems Command, Flight Test Center, Aerospace Research Pilot School, Edwards AFB, Calif.).
(Conference on Civilian and Military Uses of Aerospace, New York, N.Y., Jan. 11-14, 1965, Paper.)
New York Academy of Sciences, Annals, vol. 134, Nov. 22, 1965, p. 376-384.

Review of training and selection procedures used at the USAF Aerospace Research Pilot School. The training program consists of (1) conventional test pilot training followed by (2) space training with generalized simulations and space-oriented flying for selected graduates of phase (2). This program is to be extended to train graduates of phase (2) for the Manned Orbiting Laboratory. Selection criteria for each phase of the program are reviewed, and academic and operational training procedures for each are outlined. P.K.

A66-18581
HUMAN PERFORMANCE FOR MILITARY AND CIVILIAN OPERATIONS IN SPACE.
Walter F. Grether (USAF, Behavioral Sciences Laboratory, Wright-Patterson AFB, Ohio).
(Conference on Civilian and Military Uses of Aerospace, New York, N.Y., Jan. 11-14, 1965, Paper.)
New York Academy of Sciences, Annals, vol. 134, Nov. 22, 1965, p. 398-412. 9 refs.

Review of laboratory and spaceflight research on human performance capabilities in space. Problems examined include those associated with moving about and working both inside and outside an orbiting spacecraft, maintaining adequate performance during extended periods in space, and utilizing visual guidance for orbital rendezvous. P.K.

A66-18582
THE PHYSIOLOGICAL CLOCK IN AERONAUTICS AND ASTRONAUTICS.
Hubertus Strughold (USAF, Systems Command, Aerospace Medical Div., Brooks AFB, Tex.).
(Conference on Civilian and Military Uses of Aerospace, New York, N.Y., Jan. 11-14, 1965, Paper.)
New York Academy of Sciences, Annals, vol. 134, Nov. 22, 1965, p. 413-422. 23 refs.

Discussion of factors affecting the biorhythms which follow a "physiological clock" in man, and of implications of those factors in aeronautics and astronautics. Following a high-speed aircraft flight, an individual is subjected to a shift in the day-night cycle to which his physiological clock cannot immediately adjust. Practical consequences of this are discussed. The effects of spaceflight on the sleep and activity cycles of astronauts are reviewed. P.K.

A66-18583
A LONGLIFE BIOSATELLITE FOR EXPLORATORY TELEVISION VIEWING OF PHYSIOLOGIC DEVELOPMENT.
Dale L. Carpenter (Marquardt Corp., Astro Div., Van Nuys, Calif.), Stephen H. Fairweather, and John E. Mortimer (Radio Corporation of America, Defense Electronic Products, Astro-Electronics Div., Princeton, N.J.).
(Conference on Civilian and Military Uses of Aerospace, New York, N.Y., Jan. 11-14, 1965, Paper.)
New York Academy of Sciences, Annals, vol. 134, Nov. 22, 1965, p. 423-439. 6 refs.

Description of a Biosatellite experiment for monitoring the development of an opossum embryonic fetus in the space environment. The effect of the zero g environment on the physiological functions of the fetus will be determined by gross changes in physical appearance as displayed by high-resolution TV monitoring and by measuring EKG rate, body temperature, rate of sucking from an artificial feeding nipple, and respiration. Response to various stimuli will also be monitored. In addition, by using return spin-up to a simulated 1 g, possible reversible effects can be studied. The design and instrumentation for the experiment are reviewed. P.K.

A66-18584
DESIGN AND DEVELOPMENT OF THE APOLLO EXTRAVEHICULAR MOBILITY UNIT.
John C. Beggs (United Aircraft Corp., Hamilton Standard Div., Space and Life Systems Dept., Windsor Locks, Conn.).
(Conference on Civilian and Military Uses of Aerospace, New York, N.Y., Jan. 11-14, 1965, Paper.)
New York Academy of Sciences, Annals, vol. 134, Nov. 22, 1965, p. 441-451.

Review of work on the extravehicular mobility unit (EMU) which will clothe the astronauts of the Apollo lunar landing mission. The EMU consists of a liquid-cooled undergarment worn in direct contact with the skin, a pressure garment assembly which forms, with the helmet, an anthropomorphic pressure vessel, a meteoroid protective garment, and an extravehicular thermal garment. A portable life support subsystem is carried for lunar surface excursions. Problems involved in the design and development of the EMU are discussed. P.K.

A66-18585
BIOMAGNETICS.
Dietrich E. Beischer (U.S. Naval School of Aviation Medicine, Pensacola, Fla.).
(Conference on Civilian and Military Uses of Aerospace, New York, N.Y., Jan. 11-14, 1965, Paper.)
New York Academy of Sciences, Annals, vol. 134, Nov. 22, 1965, p. 454-458. 12 refs.
NASA-sponsored research.

Discussion of the effects on physiological behavior of extremes in magnetic environment. Test results are presented which indicate that strong deviations from the geomagnetic field should not have acute physiological effects. However, it is possible that effects may develop slowly as exposure time is extended. For example, a significant decrease in scotopic flicker-fusion threshold is found in subjects in a near-zero magnetic field, and flicker-fusion is a very sensitive test of central nervous system function. P.K.

A66-18726
A PROPOSED SATELLITE FOR TV OBSERVATION OF ZERO-G EFFECTS ON DEVELOPMENT OF THE OPOSSUM FETUS.
S. H. Fairweather and J. E. Mortimer (Radio Corporation of America, Defense Electronic Products, Astro-Electronics Div., Princeton, N.J.).
IN: SPACE ELECTRONICS.
Camden, N.J., Radio Corporation of America, 1965, p. 2-7.

The biological effects on mammalian tissue resulting from extended periods of weightlessness is of great interest to those concerned with life-support equipment and systems for space travel. This paper, based on a proposal submitted to the Air Force by RCA and the Marquardt Corporation, describes an experiment in which opossum embryos are orbited in a spacecraft and observed during development with an RCA TV-camera system. (The opossum is uniquely suited because of rapid maturation and the large amount of clinical data available on them). This experiment is designed to establish benchmarks for measuring the effects of weightlessness on human tissue. (Author)

A66-18727
LIFE BEYOND THE ATMOSPHERE - ORIGINS, DETECTION, AND SUPPORT.
A. G. Holmes-Siedle (Radio Corporation of America, Defense Electronic Products, Astro-Electronics Div., Radiation Physics Group, Princeton, N.J.).
IN: SPACE ELECTRONICS.
Camden, N.J., Radio Corporation of America, 1965, p. 8-13.

This paper discusses the existence and detection of life forms in the universe (with emphasis on our planetary system), and the support of life in manned space travel. It is shown that while we have several good ideas as to the origin of life, much sophisticated research awaits before we arrive even at a good set of hypotheses of how life occurred. Likewise, while we can detect many forms of life chemically, much more sophisticated sensors are needed for space missions to help decide whether a certain observed phenomenon may constitute "life." Finally, although we have demonstrated short-term life-support outside the atmosphere, the present crude automatic control of a few gases and fluids will have to be refined greatly before we can, for example, establish a colony on the moon. The advanced electronics for each of these pursuits offers engineers one of the greatest practical challenges of an already challenging technology. (Author)

A66-18730
THERMOELECTRIC WATER RECLAMATION FOR MANNED SPACE VEHICLES.
P. E. Wright (Radio Corporation of America, Defense Electronic Products, Applied Research Dept., Camden, N.J.).
IN: SPACE ELECTRONICS.
Camden, N.J., Radio Corporation of America, 1965, p. 21-23. 8

Practical method for reclamation of drinking water from urine by use of thermoelectrics, with discussion of the theory of operation and presentation of data from working models. Thermoelectric distillation leads to high temperature bacteria destruction and offers low weight and reduced power consumption. In application, Peltier couples sandwiched between a boiler and a condenser serve the same function as the compressor in a vapor compression cycle, and permit

regeneration of the energy of the process. Further purification can be accomplished by absorption filtration and mixed-bed ion exchange. A batch-type thermoelectric distillation device is described which, it is estimated, could operate in a space environment and provide 15,000 ml of water per day with less than 100-watt power consumption.
F. R. L.

A66-18769

FATTY CHANGE OF THE GRANULAR PNEUMOCYTE.
Enrique Valdivia, Jayashree Sonnad, and James D'Amato (Wisconsin, University, Medical School, Dept. of Pathology, Madison, Wis.).
Science, vol. 151 Jan. 14, 1966, p. 213, 214. 8 refs.
Research supported by the American Thoracic Society and NASA; Public Health Service Grants No. H 6523; No. Gm. 09387.

Description of cytoplasmic alterations which take the form of the development of fat vacuoles in the granular pneumocytes of guinea pigs exposed to severe hypoxia in low-pressure chambers. The osmiophilic lamellar bodies are apparently reduced in size and decreased in number. The fatty change of the pneumocyte may represent a metabolic alteration and interfere with the production of surfactant. This hypoxic lesion of the pneumocyte may be a significant factor in high-altitude pulmonary insufficiency. The procedure for the hypoxia experiments is described. D. P. F.

A66-18815 #

UNAIDED VISUAL DETECTION OF TARGET SATELLITES.
L. G. Summers, R. A. Shea, and K. Ziedman (Thompson Ramo Wooldridge, Inc., TRW Systems Group, Redondo Beach, Calif.).
(AMERICAN INSTITUTE OF AERONAUTICS AND ASTRONAUTICS, AND NASA, MANNED SPACE FLIGHT MEETING, 3RD, HOUSTON, TEX., NOVEMBER 4-6, 1964, TECHNICAL PAPERS. AIAA Publication CP-10, p. 148-152.)
Journal of Spacecraft and Rockets, vol. 3, Jan. 1966, p. 76-79. 8 refs.
[For abstract see issue 01, page 23, Accession no. A65-10699]

A66-18821 #

OXYGEN RECLAMATION FROM METABOLIC CARBON DIOXIDE.
Martin Macklin (Case Institute of Technology, Cleveland, Ohio).
(AMERICAN INSTITUTE OF AERONAUTICS AND ASTRONAUTICS, AND NASA, MANNED SPACE FLIGHT MEETING, 3RD, HOUSTON, TEX., NOVEMBER 4-6, 1964, TECHNICAL PAPERS. AIAA Publication CP-10, p. 142-147.)
Journal of Spacecraft and Rockets, vol. 3, Jan. 1966, p. 110-113. 11 refs.
Research supported by Thompson Ramo Wooldridge, Inc., NASA, and Navy.
[For abstract see issue 01, page 18, Accession no. A65-10698]

A66-18854

HEALTH HAZARDS IN HANDLING BERYLLIUM.
Henry H. Hausner (Brooklyn, Polytechnic Institute, Brooklyn; Rensselaer Polytechnic Institute, Troy, N. Y.).
IN: BERYLLIUM - ITS METALLURGY AND PROPERTIES.
Edited by H. H. Hausner.
Berkeley, University of California Press, 1965, p. 298-303.

Review of the health considerations in handling and processing beryllium and its compounds. The well-established fact that beryllium is toxic is noted, and it is pointed out that the lungs are the site of the most serious complications when beryllium dusts are inhaled. The recommendations of the AEC Advisory Committee as well as those of the American Conference of Governmental Hygienists are reviewed, and mention is made of the AEC recommended value of no more than 2 $\mu g/m^3$ of air as the atmospheric beryllium concentration to which a person may be exposed in the course of an average work week (40 hr). A general trend away from an ultraconservative approach of enclosing all beryllium working operations is noted. For instance, for most machining operations, low-volume, high-velocity ventilation systems are considered adequate. Eight recommendations for a number of representative operations are discussed. M. L.

A66-19083 #

BEHAVIOR OF ARTERIAL OXYGEN SATURATION AND OF PULMONARY VENTILATION IN DOGS SUBJECTED TO $+G_x$ ACCELERATION [COMPORTAMENTO DELLA SATURAZIONE ARTERIOSA IN O_2 E DELLA VENTILAZIONE POLMONARE IN CANI SOTTOPOSTI AD ACCELERAZIONI $+G_x$].
A. Dagianti (Roma, Università, Istituto di Clinica Medica, Rome, Italy), E. Busnengo, F. Rossanigo, and P. Rota.
(AGARD, Aerospace Medical Panel, Meeting, 22nd, Monaco, Sept. 1-7, 1965, Paper.)
Rivista di Medicina Aeronautica e Spaziale, vol. 28, July-Sept. 1965, p. 263-274. 21 refs. In Italian.

Investigation of the behavior of arterial saturation in O_2 and of pulmonary ventilation in five dogs anesthesized with morphine and chloralose and subjected to $+g_x$ accelerations ranging from 1 to 8 g maintained constant for periods of 1 to 5 min. A total of 96 experiments were carried out. Arterial O_2 saturation was noticed beginning at 4 g, the peak being observed during the first and second minute of exposure, and increasing with the number of g. On exposure to 3 g and over, an initial phase of apnea was found which lasted a maximum of 45 sec, followed by a period of hyperventilation which increased progressively with the number of g but decreased at the higher values of 7 and 8 g. M. M.

A66-19084 #

CONSIDERATIONS ON THE MORPHOLOGICAL AND PHYSIOLOGICAL EVALUATION OF PILOT TRAINEES SUBJECTED TO RESPIRATORY AND CARDIOVASCULAR FUNCTIONAL TESTS [ALCUNE CONSIDERAZIONI SULLE VALUTAZIONI MORFOFISIOLOGICHE IN ASPIRANTI PILOTI SOTTOPOSTI A PROVE DI ESPLORAZIONE FUNZIONALE RESPIRATORIA E CARDIOCIRCOLATORIA].
V. Correnti (Palermo, Università, Istituto di Antropologia, Palermo, Italy) and A. Scano (Centro di Studi e Ricerche di Medicina Aeronautica e Spaziale, Rome, Italy).
(Accademia Lancisiana, Meeting, Rome, Italy, June 22, 1965, Paper.)
Rivista di Medicina Aeronautica e Spaziale, vol. 28, July-Sept. 1965, p. 275-291. In Italian.

Preliminary investigation of the relation between morphological characteristics and functional data in groups of pilot trainees. Eighteen anthropometric data were recorded together with vital capacity, timed vital capacity at rest, pulmonary ventilation, O_2 intake, and heart rate during severe muscular exercise. The statistical and graphical study of the recorded data showed a characteristic formation of groups devoid of extreme cases, therefore unsuitable for the study of correlations among variables of different nature. However, the results show a trend of the anthropometric data to be arranged in conformance with the physiological parameters investigated, particularly with maximum intake of O_2. M. M.

A66-19085 #

ELECTROENCEPHALOGRAPHIC CHANGES IN ALBINO RATS SUBJECTED TO HIGH TANGENTIAL (TRANSVERSE) ACCELERATION BEFORE AND AFTER SPLENECTOMY [VARIAZIONI DELL' ELETTROENCEFALOGRAMMA DI RATTI ALBINI SOTTOPOSTI A FORTI ACCELERAZIONI TRASVERSALI (TANGENZIALI) PRIMA E DOPO LA SPLENECTOMIA].
C. Vacca (Napoli, Università, Istituto di Fisiologia Generale e Speciale degli Animali Domestici e Chimica Biologica, Naples, Italy), L. Vacca, and L. Causa.
(Federazione Astronautica Internazionale, Congresso, 16th, Athens, Greece, Sept. 13-18, 1965, Paper.)
Rivista di Medicina Aeronautica e Spaziale, vol. 28, July-Sept. 1965, p. 292-301. In Italian.

Experimental investigation in which three-lead EEG's were recorded from 12 albino rats of both sexes with average weights of 250 g, subject to complete barbituric anesthesia (full resolution of postural tone) in normal animals and in animals 10 days after splenectomy, before, during, and after application of high transversal acceleration ranging from 3 to 6 to 8 or 9 g for 90 sec. It is noted that the experimental results show that the changes of frequency, morphology, and voltage observed after splenectomy in basal EEG waves are not clear enough to be considered as significant alterations of the bioelectric activity of nervous cells, at least in the light of the pilot research carried out so far. M. M.

A66-19086 #
EFFECTS OF IONIZING RADIATION IN ANIMALS PROTECTED WITH HYPOXIA OR WITH CHEMICALS [EFFETTI DELLE RADIAZIONI IONIZZANTI IN ANIMALI PROTETTI MEDIANTE IPOSSIA O MEDIANTE ALCUNE SOSTANZE CHIMICHE].
G. Mazzella and G. Paolucci.
(Flugmedizin und Bemannte Raumstationen, Symposium, Monaco, Sept. 8-10, 1965, Paper.)
Rivista di Medicina Aeronautica e Spaziale, vol. 28, July-Sept. 1965, p. 302-312. 7 refs. In Italian.

Experimental investigation performed on 120 mice Balb/c of both sexes divided into groups to test the possibility of protection from the lethal effects of ionizing radiation, after treatment respectively with ethyl-palmitate, i. v. and i. p., dosed 2. 5/3. 5/kg, 48 hr prior to irradiation, with zymosan i. p., dosed g 190/kg, given three times prior to and twice after irradiation, with a 6% oxygen mixture, during irradiation. The results showed, after 100 days, a survival rate of 25% in the group treated with ethyl-palmitate, and of 94% in the group irradiated during hypoxia. The group treated with zymosan died earlier than the control group. It is concluded that a prolonged but impermanent protection from ionizing injuries can be achieved with different processes such as with drugs given prior to irradiation. M. M.

A66-19087 #
SAMPLING OF AIRBORNE BACTERIA BY MEANS OF A CASCADE VAULT SAMPLER [IL PRELIEVO DI BATTERI AEROGENI MEDIANTE UN CAMPIONATORE A VOLTA IN CASCATA].
L. Mammarella.
Rivista di Medicina Aeronautica e Spaziale, vol. 28, July-Sept. 1965, p. 313-326. 5 refs. In Italian.

Description of a simple device for sampling bacterial aerosols with a rather large unit size of approximately 40 μ and over. It is pointed out that the tests performed gave satisfactory results compared with those achieved by means of a holed-disk sampler. M. M.

A66-19238
SPACECRAFT STERILIZATION.
A. M. Nowitzky (Lockheed Aircraft Corp., Burbank, Calif.).
Boulder, Colo., Johnson Publishing Co., 1965. 356 p.
$20.

This book is devoted to the problems of prevention of contamination of other celestial bodies by terrestrial organisms via space vehicles. In order to prevent precontamination of extraterrestrial biological sampling devices, the design philosophy of spacecraft must encompass sterilization requirements which extend from the initial design of these vehicles through the phases of fabrication and final launch. Translation of biological laboratory and hospital techniques into launch pad procedures and methods that are applicable to flight hardware is the primary objective of this volume. After a review of the historical background which led up to the awareness that prelaunch sterilization was necessary, the general scope and requirements for such sterilization are discussed. Internal sterilization by heat, irradiation, chemical additives, sporicidal materials, and similar agents is described. The concepts and techniques of sterile assembly are considered and a description of sterilization with ethylene oxide and other sterilant gases is included. Sterilization equipment for aerospace ground equipment and facilities includes heat sterilization, gas sterilization, sterile assembly, sterile cooling, and sterility maintenance. The design characteristics for extraterrestrial biological sampling devices in the light of sterility requirements are examined. Manned spacecraft design is discussed in terms of mutual contamination problems. D. P. F.

A66-19723
THE INHALATIONAL TOXICITY OF OXYGEN DIFLUORIDE.
David Lester (Rutgers University, Center of Alcohol Studies, New Brunswick, N.J.) and W. Robert Adams (Yale University, School of Medicine, Dept. of Pathology, New Haven, Conn.).
(American Industrial Hygiene Conference, Houston, Tex., May 3-7, 1965, Paper.)
American Industrial Hygiene Association, Journal, vol. 26, Nov.-Dec. 1965, p. 562-567. 5 refs.
Research supported by Allied Chemical Corp.

The acute inhalational toxicity of oxygen difluoride in the albino rat has been determined at concentrations of 5 to 40 ppm for 5 to 15 minutes. A CT product (ppm-minutes) of about 100 results in 50% mortality. At the levels studied, gross and microscopic pulmonary damage develop 7 hours after termination of the exposure, and, if death does not intervene, repair begins after the third day. The extreme toxicity of oxygen difluoride and its insidious character make it imperative to exclude its inhalation by personnel. (Author)

A66-19724 =
COMPARATIVE TOXICITY STUDIES AT REDUCED AND AMBIENT PRESSURES. I - ACUTE RESPONSE.
James M. McNerney and James D. MacEwen (Aerojet-General Corp., Toxic Hazard Research Unit, Overlook Branch, Dayton, Ohio).
American Industrial Hygiene Association, Journal, vol. 26, Nov.-Dec. 1965, p. 568-573. 18 refs.
Contract No. AF,33(657)-11305.

Comparison of the acute response to toxicants at ambient and reduced pressures (5 psia; 100% O_2) were made by exposing monkeys, dogs, rats, and mice for 2 weeks of continuous inhalation exposure to NO_2, O_3, and CCl_4. The experimental results show a definite reduction in the toxic response to the pulmonary irritants NO_2 and O_3 at reduced pressure when compared with ambient pressure exposures. With CCl_4, a systemic toxicant, no significant differences between the animals exposed at ambient or reduced pressure were observed. (Author)

LC ENTRIES

A66-80510
ANAESTHESIA AT HIGH ALTITUDES: PRACTICAL ASPECTS WITH SPECIAL REFERENCE TO THE REQUIREMENTS OF THE ARMED FORCES OF INDIA.
K. R. Rama Rao.
(Indian Soc. of Anaesthetists, 15th Ann. Conf., Bombay, Dec. 28, 1964).
Indian Journal of Anaesthesia, vol. 13, Feb. 1965, p. 16–25. 47 refs.

In giving anaesthesia to persons temporarily stationed at high altitudes several factors must be considered: (1) chronic hypoxia; (2) hyperventilation; (3) tendency to respiratory alkalosis; and (4) lack of tolerance to physical stress. There are also physical disadvantages during the procedure, such as low ambient temperature, high winds, low humidity and, in some regions, an abundance of dust particles in the air. In many cases a sufficient quantity of equipment is lacking, and quarters are inadequate. All these factors limit the choice of drugs and methods used by anesthetists.

A66-80511
VISUAL SIMULATION FOR AIRCRAFT AND SPACE FLIGHT TRAINERS.
P. M. Carey (Central Dyn. Ltd., Montreal, P. Q., Canada).
Institution of Electronic and Radio Engineers: Proceedings of the Canadian Division, vol. 2, Nov. 1965, p. 11–19. 10 refs.
Central Dyn. Ltd. and Dept. of Ind. Res. sponsored research.

The author outlines the newly emergent technology of visual simulation. The purpose of such a device is to create a synthetic visual reproduction of an external environment and display a dynamic perspective picture to a pilot in a ground-based flight trainer. Visual simulator design must consider three often unrelated disciplines, namely Electronics, Optics, and Psychology. Factors influencing the field of visual simulation and some of the design concepts are described. The current state of the art and postulated future developments are indicated.

A66-80512
PERCEPTION BIBLIOGRAPHY: XXI. PSYCHOLOGICAL INDEX, NO. 17, 1910.
C. H. Ammons and R. B. Ammons (Mont. U., Missoula).
Perceptual and Motor Skills, vol. 21, Oct. 1965, p. 587–590. 102 refs.

This is an alphabetical listing of 102 references to work in perception, selected from Psychological Index, XXI, no. 17, 1910.

A66-80513
REMOTE MANIPULATION WITH TRANSMISSION DELAY.
William R. Ferrell (Mass. Inst. of Technol., Dept. of Mech. Eng., Cambridge).
IEEE Transactions on Human Factors in Electronics, vol. HFE-6, Sep. 1965, p. 24–32. 5 refs.
NASA Grant NsG-107-61.

The effect on the performance of both simple and complex tasks of inserting transmission delay between the master and slave elements of a remote manipulator was studied. Most operators spontaneously adopted an effective "move-and-wait" strategy to cope with delay. A modification of a method proposed earlier enabled task-completion time to be accurately predicted from data taken when there was no delay. With the move-and-wait strategy, completion time depends on the length of sequences of open-loop movements. The number of such moves for positioning in one dimension as a function of task difficulty was found to agree with that predicted by a simple statistical model.

A66-80514
CIRCADIAN CLOCKS; PROCEEDINGS OF THE FELDAFING SUMMER SCHOOL 7–18 SEPTEMBER 1964.
Jürgen Aschoff, ed. (Max-Planck-Inst. für Verhaltensphysiol., Erling-Andechs, Germany).
Edited by Jürgen Aschoff.
Sponsored by North Atlantic Treaty Org.
Amsterdam, North-Holland Publishing Co., 1965, xix+ 479 p. Many refs.

The Scientific Advisory Board of the North Atlantic Treaty Organization facilitated the organization of a Summer School to summarize present knowledge and, at the same time, to give students an opportunity to become acquainted with techniques and ideas used in the study of circadian clocks. Included in these proceedings are the following: (1) vocabulary defining technical terms and listing widely-accepted or suggested symbols; (2) methods and analysis; (3) observations and generalizations regarding circadian frequencies, synchronization, cell division, and influence of temperature on biological clocks; (4) biochemistry and physiology; syntheses and hypotheses; (5) recent experimental results; (6) photoperiodism as related to circadian systems; and (7) applied and general aspects. Pertinent articles are abstracted separately.

A66-80515
SOURCES OF ERROR IN THE STUDY OF DIURNAL RHYTHM IN ENERGY METABOLISM.
A. Heusner (Fac. de Med., Inst. de Physiol., Strasbourg, France; and Montreal U., Dept. de Biol., Canada).
IN: CIRCADIAN CLOCKS; Proc. of the Feldafing Summer School, 7–18 Sep. 1964.
Edited by Jürgen Aschoff.
Amsterdam, North-Holland Publishing Co., 1965, p. 3–12. 13 refs.

In studying the biological rhythms of energy metabolism, one has to take into account possible periodical errors. Th remove the dubiousness that these errors cast on every measurement, they have to be negligible in comparison with the amplitude of the expected biological variation.

A66-80516
PENDULUM VERSUS RELAXATION OSCILLATION.
R. Wever (Max-Planck-Inst. für Verhaltensphysiol., Seewiesen und Erling-Andechs, Germany).
IN: CIRCADIAN CLOCKS; Proc. of the Feldafing Summer School, 7–18 Sep. 1964.
Edited by Jürgen Aschoff.
Amsterdam, North-Holland Publishing Co., 1965, p. 74–83. 9 refs.

Two important biological principles, the rhythmicity and the homeostasis, seem to be only different aspects of one general biological principle. In a persistent oscillation, the mean value of the oscillating functions must be controlled to stay inside the oscillatory range; if it deviates from this range, the oscillation dies out. In homeostasis, the controlled function must oscillate with properties known from biological rhythms. If it ceases to oscillate, or if it deviates from the oscillation equation mentioned, the control system becomes unstable.

A66-80517
A MATHEMATICAL MODEL FOR CIRCADIAN RHYTHMS.
R. Wever (Max-Planck-Inst. für Verhaltensphysiol. Seewiesen und Erling-Andechs, Germany).
IN: CIRCADIAN CLOCKS; Proc. of the Feldafing Summer School, 7–18 Sep. 1964.
Edited by Jürgen Aschoff.
Amsterdam, North-Holland Publishing Co., 1965, p. 47–63. 15 refs.

By using only two generalizations of the biological circadian oscillations—its capacity to be self-sustained (within a certain oscillatory range), and the circadian rule—all general properties of circadian rhythms can be derived. In order to see more clearly the consequences of these generalizations, a mathematical model has been used. The proposed differential equation contains no more specific terms than dictated by the simplest mathematical equivalents of the biological generalizations. It is clear that this model with its simple premises can only describe the general individuals or species. For this, the simple equation must be extended by more complicated terms. These may be, for instance, terms of the third order for describing a two-peaked activity pattern.

A66-80518
NEUROPHYSIOLOGICAL ASPECTS OF MANNED EXTRATERRESTRIAL SPACE FLIGHT.
W. K. Stewart (Roy. AF, Inst. of Aviation Med., Farnborough, Hants, Great Britain).
IN: PROC. FIRST INTERN. SYMP. ON BASIC ENVIRON. PROBL. OF MAN IN SPACE, Paris, 1962.
Wien, Springer-Verlag, 1965, p. 65–75; Discussion, p. 75–76.

The value of studying neurophysiology in relation to manned space flight, after it has been amply demonstrated that man is capable of withstanding the environmental stresses of space and of continuing to work and make use of his mental faculties, is discussed. A training in neurophysiology and behavioral techniques may, in certain instances, be the basic factor in investigations of bizarre reaction in normal man, even though the methodology of research, as compared to work on animals, may be limited upon advances in electronics and computational analysis. Where failures of the human controller occur, as in the onset of unawareness, it is acknowledged that a full understanding cannot be achieved without fundamental work on the neural correlates, such as the coding of sensory impulses or the control of transmission in relation to motor responses. An understanding of illusions may not be possible without consideration of the organized relationship of the brain stem and cortical activity. Similarly, it is of importance to have an understanding of conditioning processes to differentiate between the trained and untrained man in the stability of selected responses.

A66-80519
RADIOBIOLOGICAL PROBLEMS OF SPACE FLIGHTS [RADIOBIOLOGICHESKIE PROBLEMY KOSMICHESKIKH POLETOV].
G. M. Frank, P. P. Saksonov, V. V. Antipov, and N. N. Dobrov (USSR, Acad. of Sci., Moscow).
IN: PROC. FIRST INTERN. SYMP. ON BASIC ENVIRON. PROBL. OF MAN IN SPACE, Paris, 1962.
Wien, Springer-Verlag, 1965, p. 240–264; discussion, p. 265–266. 23 refs. In Russian and English.

Experiments on cosmic radiation effects were conducted on a variety of biological subjects using different research methods. Analysis of the material showed that flights of short duration in orbits below the radiation belts, in the absence of intense solar activity, present no radiation hazard. This was confirmed by the flights of Soviet and American cosmonauts. For long flights in orbits passing through the radiation belts near the earth, particularly during outbursts of solar activity generating protons, cosmic radiation will be one of the major obstacles to man's conquest of space. In this connection the most urgent problems are as follows: (1) to determine the relative biological efficiency, and to study the biophysical characteristics, of the action of the different components of cosmic radiation; (2) to determine the specific role of cosmic radiation in the biological effects of the complex of space flight factors; (3) to work out principles and methods for the physical and pharmacochemical protection of man and the whole bio-complex; (4) to explore the genetic dangers of space flight; (5) to study the biological effects of the ionizing radiation due to the operation of atomic power units, against the background of the effects of the various space flight factors; (6) to devise methods of physical and biological dosimetry; and (7) to establish basic principles for forecasting radiation under the actual conditions of space flight (forecasting solar flares, measuring levels of cosmic radiation in the upper layers of the atmosphere, etc.).

A66-80520
BIOLOGICAL HAZARDS OF RADIATION APPLICABLE TO MAN IN SPACE.
G. J. Neary and E. V. Hulse (Med. Res. Council, Radiobiol. Res. Unit, Harwell, Great Britain).
IN: PROC. FIRST INTERN. SYMP. ON BASIC ENVIRON. PROBL. OF MAN IN SPACE, Paris, 1962.
Wien, Springer-Verlag, 1965, p. 267–283; discussion, p. 283–284. 50 refs.

The concept of recovery from radiation injury is discussed, and it is concluded that there is no simple correlation between degree of recovery from early effects and the risk of delayed effects. Detailed data for recovery from early effects are available only for gross injury. The concept of relative biological effectiveness (RBE) of different types of ionizing particles is also discussed. Although RBE varies with dose and dose rate, it probably assumes a constant value for any one effect at low doses or dose rates. The best estimate of the values for man are those given by the International Commission on Radiological Protection for use in the range of permissible exposures. Data relevant to high energy protons are given. The special problem of very heavy particles in space is unlikely to be a limiting hazard. The delay effects of radiation are reviewed. Chemical pre-protection of an astronaut appears to be undesirable. Treatment of radiation injury is summarized.

A66-80521
ADAPTATION OF MICE TO COLD.
S. A. Barnett (Glasgow U., Dept. of Zool., Scotland).
Biological Reviews, vol. 40, Feb. 1965, p. 5–51. 143 refs.

Since 1963, laboratory mice have been bred continuously in an environment kept at –3° C. Control stocks are kept at 21° C. All mice have cotton wool bedding. The effects of the cold environment are reviewed, and related to observations on other species exposed to cold. The topics discussed are (1) physiological adaptation; (2) anatomical changes; (3) effect on reproduction; and (4) genetic lines.

A66-80522
MICROSLEEP RESPONSES IN THE RAT.
Frank Johnson and Wilse B. Webb (Fla. U., Gainesville).
Psychonomic Science, vol. 3, Dec. 1, 1965, p. 499–500.
Grant NIH MH-03881.

Short latency sleep responses were found to occur with greater efficiency under conditions of sleep deprivation than non-sleep deprivation. Following a period of sleep deprivation the efficiency of these microsleep responses increased as a function of trials within experimental sessions and across sessions.

A66-80523
THE ROLE OF THE MITOCHONDRIAL APPARATUS OF LYMPHOCYTES IN THEIR RESPONSE TO IONIZING RADIATION [ROL' MITOKHONDRIAL'NOGO APPARATA LIMFOTSITOV V IKH REAKTSII NA IONIZIRUIUSHCHIE IZLUCHENIIA].
V. M. Manteifel' and M. N. Meisel' (USSR, Acad. of Sci., Inst. of Mol. Biol., Moscow).
Izvestiia Akademi Nauk SSSR. Seriia Biologicheskaia, no. 6, Nov.–Dec. 1965, p. 884–897. 72 refs. In Russian.

Electron microscopy studies of lymphatic nodes of animals irradiated with a large dose or at a higher ionizing radiation dose rate revealed early lymphocytic lesions of the lipoprotein membranes of cellular organelles. The changes involved stratification and vacuolization of two-layer membranes and destruction of mitochondrial crystae. They developed in mitochondria earlier than in the nuclei preceding structural lesions of nuclear nucleoproteins. Fusion of damaged mitochondria has been convincingly proved together with the fact of their increasing contact with nuclear membranes. A comparison of the results obtained in our study with the literature data on early structural and ultrastructural lesions and on functional damages in mitochondria and nuclei of irradiated radiosensitive cells suggests their interdependence. An important role in radiosensitivity of lymphocytes and other cells similarly responding to irradiation belongs to damageability of a relatively limited number of mitochondria and, consequently, to disturbances in the cellular metabolic rates which in turn promote radiation pathology and prevent reparation of irradiation induced lesions.

A66-80524
ACCURATE GEOPHYSICAL RHYTHMS AND FREQUENCY ANALYSIS.
J. T. Enright (Calif. U., Dept. of Zool., Los Angeles).
IN: CIRCADIAN CLOCKS; Proc. of the Feldafing Summer School, 7–18 Sep. 1964.
Edited by Jürgen Aschoff.
Amsterdam, North-Holland Publishing Co., 1965, p. 31–42. 24 refs.

The evidence from frequency analysis that some organisms may occasionally show rhythms with periods quite near 24 hr. under constant light conditions suggests the possibility that some environmental stimulus other than cycles of light and temperature may be able to synchronize circadian rhythms. Laboratory noises, or feeding regimes or similar commonplace agents, may be responsible for such synchronization, if synchronization is, indeed, involved, rather than unsynchronized circadian rhythms with true average periods of, for example, 24 hr. 5 min. Barometric pressure, or cosmic radiation, or similar geophysical variables of a category not widely recognized as biologically effective, are the synchronizing agents for these (uncommon) cases in which frequency analysis suggests relatively exact diurnal rhythms. The influence of subtle geophysical stimuli on biological rhythms might be based on the occurrence under laboratory conditions of exact average lunar-tidal rhythms, should through analysis of biological data support the hypothesis that such components are consistently or commonly present as more than background. None of the analyses of the data presently available to the author have offered evidence of this sort. Until such evidence becomes available, a synchronizing action of subtle geophysical agents on biological rhythms represents an interesting hypothesis, for which there is, at present, no convincing support.

A66-80525
OVERT CIRCADIAN FREQUENCIES AND CIRCADIAN RULE.
Klaus Hoffman (Max-Planck-Inst. für Verhaltensphysiol., Seewiesen und Erling-Andechs, Germany).
IN: CIRCADIAN CLOCKS; Proc. of the Feldafing Summer School, 7–18 Sep. 1964.
Edited by Jürgen Aschoff.
Amsterdam, North-Holland Publishing Co., 1965, p. 87–94. 38 refs.

The author presents his observations and generalizations on circadian frequencies and circadian rule. Frequency, the ratio of activity-time to rest-time, and amount of activity were found to be positively correlated in the majority of animals studied (rodents, birds, insects and reptiles). A violation of the rule was noticed in some species. The masking effects of exposure to temperature cycles in some instances also showed exceptions to the rule. The conclusion may be reached from these observations that the amount of activity and length of activity time are not only functions of the circadian mechanisms, but can also be influenced by other factors not involved in the mechanism of oscillation, such as changes of the threshold or other factors which may affect the direction of expression of overt locomotor activity.

A66-80526
RESPONSE CURVES IN CIRCADIAN PERIODICITY.
J. Aschoff (Max-Planck-Inst. für Verhaltensphysiol., Seewiesen und Erling-Andechs, Germany).
IN: CIRCADIAN CLOCKS; Proc. of the Feldafing Summer School, 7–18 Sep. 1964.
Edited by Jürgen Aschoff.
Amsterdam, North-Holland Publishing Co., 1965, p. 95–111. 37 refs.

The author discusses the validity of the response curves in circadian periodicity. Several topics are discussed: (1) Methods of obtaining and plotting the response curve; (2) properties of the signal, such as duration, intensity, and signal sign; (3) special techniques and problems, including step experiments and crossing the impulse Zeitgeber; and (4) the ideal curve and factors, which may affect the actual curve.

A66-80527
SYNCHRONIZATION AND RANGES OF ENTRAINMENT.
J. T. Enright (Calif. U., Dept. of Zool., Los Angeles).
IN: CIRCADIAN CLOCKS; Proc. of the Feldafing Summer School, 7–18 Sep. 1964.
Edited by Jürgen Aschoff.
Amsterdam, North-Holland Publishing Co., 1965, p. 112–124. 22 refs.

The essential element of a potential entraining cycle for a circadian rhythm can be any stimulus which is able to alter the period of the endogenous rhythm by an amount which depends on its instantaneous phase relation to the rhythm. If such a stimulus is presented in cycles which are sufficiently close in period to that of the unsynchronized rhythm (and certain stability criteria are met), entrainment will result. The steady-state response curve permits a quantitative definition of "sufficiently close in period", i.e., the range of entrainment; and can also indicate the steady-state phase relationship to be expected, under the influence of the chosen period of the forcing cycle. If the selected cycle for the stimulus is not "sufficiently close in period", entrainment will not result; the biological rhythm will progress through the environment cycle, showing a period which depends upon the instantaneous phase relationship between environmental and biological cycles. For a given organism a response curve and a range of entrainment are not unique properties of a particular category of stimuli (e.g., light cycles, or temperature cycles), but depend on several parameters of the imposed cycle. An adequate exploration of the relationships between different response curves derived for different stimulus situations represents one of the major current problems in the control-system approach to synchronization phenomena.

A66-80528
SOME ASPECTS OF BIOLOGIC DATA ANALYSIS; LONGITUDINAL AND TRANSVERSE PROFILES OF RHYTHMS.
Franz Halberg (Minn. U., Dept. of Pathol., Minneapolis).
IN: CIRCADIAN CLOCKS; Proc. of the Feldafing Summer School, 7–18 Sep. 1964.
Edited by Jürgen Aschoff.
Amsterdam, North-Holland Publishing Co., 1965, p. 13–22. 11 refs.
NASA Contract NsG 517; Contract FAA FA/AC-4-735; and PHS supported research.

The concepts of physiologic variation must differentiate between spectral and homeostatic studies, both involving the so-called normal range of physiologic variation. This range can be evaluated for two complementary purposes: (a) In a so-called homeostatic approach, a "macroscopic" approximation to physiologic function, one establishes certain upper and lower physiologic limits in order to evaluate gross deviations from the "normal level" of a given physiologic function. One may do so with reference to clock hour but thereby one has not obtained complete information on rhythms. (b) In a so-called spectral approach, a "microscopic" evaluation of physiologic function, temporal reference standards within the physiologic range are utilized. More specifically, quantities descriptive of rhythms, such as frequency, amplitude and phase—as well as the "level"—serve as endpoints, in order to describe normal function and abnormality. The spectral approach is based upon the view that an organism's behavior is rhythmic, with sets of frequency components in each of many functions.

A66-80529
CELL DIVISION RHYTHMS AND THE CIRCADIAN CLOCK.
V. G. Bruce (Princeton U., Dept. of Biol., N. J.)
IN: CIRCADIAN CLOCKS; Proc. of the Feldafing Summer School, 7–18 Sep. 1964.
Edited by Jürgen Aschoff.
Amsterdam, North-Holland Publishing Co., 1965, p. 125–138. 53 refs.

The significance of cell-division and similar rhythms is the following: the generalized cell has potentially or in fact many cyclic regulatory mechanisms which may have different period lengths and may be switched on or off. These cyclic mechanisms may be strongly coupled, weakly coupled, or completely dissociated from one another. The question of whether the circadian clock cycle exists in any particular cell is thus not completely answerable in the negative; for if it has become dissociated from the cellular phenomena which it normally regulates and is itself "experimentally invisible" then one can not say that the cell is without a clock. However, the general non-involvement of the cellular circadian clock cycle in the synchronization of most mitotic and cell-division rhythms are interpreted as being a consequence of the cell having a circadian generation time together with synchronizing stimuli such as hormonal influences, light-dark cycles, or other extracellular factors. There are exceptions in which the cellular clock does seem to be strongly coupled to the divisions regulating cycle and one can anticipate that, with some cells, variations in culturing conditions may result in the coupling or uncoupling of these cycles.

A66-80530
THE INFLUENCE OF TEMPERATURE AND TEMPERATURE CHANGES ON BIOLOGICAL CLOCKS.
Malcolm B. Wilkins (East Anglia U., Norwich, Great Britain).
IN: CIRCADIAN CLOCKS; Proc. of the Feldafing Summer School, 7–18 Sep. 1964.
Edited by Jürgen Aschoff.
Amsterdam, North-Holland Publishing Co., 1965, p. 146–163. 46 refs.

The induction of a biological rhythm in aperiodic organisms can be achieved by a single or repeated stimulus, or by changing the ambient temperature in systems not actively inhibited by the existing environment. In these changes, the factors to be considered are: phase, period, and amplitude, and persistance of rhythm. In the established rhythms, consideration should be given to pulse-type stimuli and step-type stimuli. The interaction of illumination and temperature cycles may be determined by the magnitude of both factors. Presently available data indicate differences in different systems in the relationships of circadian rhythm and photoperiodicity.

A66-80531
MOLECULAR ASPECTS OF CIRCADIAN SYSTEMS.
J. Woodland Hastings (Ill. U., Div. of Biochem., Urbana) and Alex Keynan (Israel Inst. for Biol. Res., Ness Ziona, Israel).
IN: CIRCADIAN CLOCKS; Proc. of the Feldafing Summer School, 7–18 Sep. 1964.
Edited by Jürgen Aschoff.
Amsterdam, North-Holland Publishing Co., 1965, p. 167–182. 16 refs.
NSF and U. of Ill. supported research.

Studies of the molecular mechanism of rhythmicity in dinoflagellates were conducted in order to understand the biological control mechanisms. Specifically, the properties of cell division and the photosynthetic capacity rhythms were studied. The experiments indicated the presence of macromolecular synthesis inhibitors, which affected the glow rhythm. These findings suggest the involvement of a messenger RNA in the biological rhythm. No indication of DNA involvement was noted. Investigations of the biochemical basis of the rhythmic changes in luminescent systems disclosed intracellular crystalline-like structures, rather than a soluble enzyme.

A66-80532
RHYTHMICITY IN THE BIOCHEMISTRY OF PHOTOSYNTHESIS IN GONYAULAX.
Beatric M. Sweeney (Yale U., Dept. of Biol., New Haven, Conn.)
IN: CIRCADIAN CLOCKS; Proc. of the Feldafing Summer School, 7–18 Sep. 1964.
Edited by Jürgen Aschoff.
Amsterdam, North-Holland Publishing Co., 1965, p. 190–194. 7 refs.

Investigations of biochemical factors responsible for the rhythm in photosynthesis in dinoflagellates disclosed that the rate of the Hill reaction was the same at midday and midnight, although the expected differences in photosynthesis were observed. The rate of dichlorophenol-indophenol reduction in the light by homogenates of cells taken at noon and midnight was identical. No difference in the sensitivity to dichlorophenyl-dimethylurea was noted during the cycle. Thus, the locus of rhythm was neither in the pigment system nor in the electron transfer. Ribulose diphosphate carboxylase in homogenates at different phases of the cycle was correlated with photosynthesis. These enzyme changes may direct the photosynthesis rate.

A66-80533
THE ROLE OF THE NUCLEUS IN A CYTOPLASMIC DIURNAL RHYTHM.
H. G. Schweiger and E. Schweiger (Max-Planck-Inst. für Meeresbiol., Wilhelmshaven, West Germany).
IN: CIRCADIAN CLOCKS; Proc. of the Feldafing Summer School, 7–18 Sep. 1964.
Edited by Jürgen Aschoff.
Amsterdam, North-Holland Publishing Co., 1965, p. 195–197. 7 refs.

The results of experiments show that cytoplasmic RNA synthesis is increased by substances which originate in the nucleus. It is possible that these substances are related to those by which the nucleus is capable of determining the cytoplasmic circadian rhythm of oxygen evolution. The persistence of this periodicity in anucleate Acetabularia is good evidence for the existence of a cytoplasmic mechanism in these cells which preserves the rhythm for a long time even in the absence of the nucleus. This might be explained by the capability of the chloroplasts of Acetabularia for DNA-dependent RNA-synthesis.

A66-80534
SIGNIFICANCE OF ENDOCRINES AND CENTRAL NERVOUS SYSTEM IN CIRCADIAN RHYTHMS.
S. K. Roberts (Temple U., Philadelphia, Pa.)
IN: CIRCADIAN CLOCKS; Proc. of the Feldafing Summer School, 7–18 Sep. 1964.
Edited by Jürgen Aschoff.
Amsterdam, North-Holland Publishing Co., 1965, p. 198–213. 69 refs.
Grant NSF 23953.

Experiments on insects indicate a neurendocrine site, presumably within the pars-intercerebralis, which may have an effect on the locomotor circadian rhythm. Experiments in crustaceans by removal of the eyestalk system

showed that this system may play a role in locomotor and color change rhythms, although the accretionary growth of the calcium rhythm and oxygen consumption were not affected by the eyestalk ablation. In vertebrates, numerous experiments indicate an involvement of the central nervous system in the overall physiological rhythm. Studies of the endocrine system involvement in biological rhythms suggest that different endocrine systems act to mutually couple together diverse circadian systems by regulating frequencies rather than by affecting rhythms as such.

A66-80535
HOURS OF CHANGING RESPONSIVENESS IN RELATION TO ALLERGY AND THE CIRCADIAN ADRENAL CYCLE.
Alain Reinberg (Paris U., Fac. des Sci., Lab. de Physiol. Chim., Paris, France).
IN: CIRCADIAN CLOCKS; Proc. of the Feldafing Summer School, 7–18 Sep. 1964.
Edited by Jürgen Aschoff.
Amsterdam, North-Holland Publishing Co., 1965, p. 214–218. 11 refs.

An analysis of physiological and physiopathological processes, the so-called "hours of changing resistance or responsiveness", was conducted on human subjects. Circadian rhythms of corticoids, keto-steroids and potassium excretion were studied on asthmatics and on normal subjects during normal (2100–0700) sleep. The results showed that circadian hypoactivity of the adrenal system may induce nocturnal asthma attacks but may not be the only factor responsible. In a group of normal subjects, studies of skin reactions to histamine showed a temporal relationship between circadian rhythm in cutaneous responses and corticoid excretion. In a third group of normal subjects administration of an antihistamine drug showed varying degrees of histamine effect inhibition when it was administered at different phases of the circadian rhythm.

A66-80536
DISSOCIATION IN HUMAN RHYTHMIC FUNCTIONS.
Mary C. Lobban (Natl. Inst. for Med. Res., Div. of Human Physiol., London, Great Britain).
IN: CIRCADIAN CLOCKS; Proc. of the Feldafing Summer School, 7–18 Sep. 1964.
Edited by Jurgen Aschoff.
Amsterdam, North-Holland Publishing Co., 1965, p. 219–227. 22 refs.

The dissociation in human rhythmic functions, such as excretion of water, potassium, sodium and chloride in patients and normal subjects exposed to variations of light–dark periods, indicate that light is an important Zeitgeber in the synchronization of circadian rhythms in man. But the anomalies in the observations concerning the excretion of potassium, in particular, also indicate that light is not the only factor so involved. Much more work is needed upon the human subject in different environmental conditions and on different work schedules before the roles of environmental and social factors and the activity pattern in the maintenance of the normal human physiological daily rhythms can be fully evaluated.

A66-80537
A UNIFIED THEORY FOR BIOLOGICAL RHYTHMS.
Frank A. Brown, Jr. (Northwestern U., Evanston, Ill.)
IN: CIRCADIAN CLOCKS; Proc. of the Feldafing Summer School, 7–18 Sep. 1964.
Edited by Jürgen Aschoff.
Amsterdam, North-Holland Publishing Co., 1965, p. 231–261. 75 refs.
Contracts ONR 1228-03 and 1228-30; and Grants NSF G-15008 and NIH GM-07405.

The results of a series of studies gave strong support to a hypothesis for the extrinsic timing of circadian rhythms, can account for the basic timing of all biological-clock-timed rhythms which persist in unvarying light and temperature. It does not matter whether they possess accurately one of the major geophysical frequencies, the solar day, lunar day, month, or year, or instead are circadian, circa-tidal or circa-monthly. The alternative hypothesis, that of internal timing of circadian periods, can not account for the geophysically dependent 24 hr. variations which have been proven to exist. It deals only with the simultaneous presence of two closely related frequencies, the lunar-tidal and solar-daily, which appear able to coexist indefinitely in constant conditions. And exclusively independent internal timing of the persistent monthly and annual rhythms seems beyond plausibility. The probability of extrinsic timing of biological rhythms has been increased by the very recent demonstrations not only of organismic sensitivities to very weak subtle geophysical forces and their proven associations with 'clock' and 'compass' phenomena, but even more so by the unequivocal demonstrations of specialized adjustments of the receptive systems to the natural ambient field strengths. From the latter findings alone, one would be forced to postulate periodisms of natural geophysical frequencies in the organism in constant temperature and illumination even had none already been proven to occur. Whether or not, however, the extrinsic biological variations prove to be still sought timers of the circadian rhythms, they comprise a real element in the variations of terrestrial animals and plants, and steadily contribute to the variations in the organisms, whether in the controlled constancy of the laboratory or free in their natural habitats.

A66-80538
THE PHASE-ANGLE DIFFERRENCE [SIC] IN CIRCADIAN PERIODICITY.
J. Aschoff (Max-Planck-Inst. für Verhaltensphysiol., Seewiesen und Erling-Andechs, Germany).
IN: CIRCADIAN CLOCKS; Proc. of the Feldafing Summer School, 7–18 Sep. 1964.
Edited by Jürgen Aschoff.
Amsterdam, North-Holland Publishing Co., 1965, p. 262–276. 41 refs.

Adaptation to the temporal order in the environment has resulted in a species-specific phase-angle difference between the circadian rhythm of the organism and the Zeitgebers. The study of these phase-relationships is of ecological as well as of theoretical interest. The combination of both aspects may lead, on the one hand, to new concepts in the search for a physiological (functional) taxonomy and, on the other hand, it supports a special model for the mechanism underlying circadian rhythmicity. Some of the features are plain consequences of the fact that, in circadian rhythms, we are dealing with self-sustained oscillations which are entrained by another oscillation. Other phenomena, which from the raw data do not seem to fit to any general rule, become meaningful and instructive when ordered on the basis of special assumptions concerning the mechanism of entrainment. In this connection, the problem of "corresponding phases" in the oscillations of Zeitgeber and organism needs attention. Especially in case of locomotor activity, one has to keep on mind that choosing onset of activity for reference already implies a hypothesis. It seems worthwhile to compare results based on this approach with those for which other phases of the activity cycle have been used for computing the phase-angle difference.

A66-80539
ON THE MECHANISM OF THE ENTRAINMENT OF A CIRCADIAN RHYTHM BY LIGHT CYCLES.
C. S. Pittendrigh (Princeton U., N. J.)
IN: CIRCADIAN CLOCKS; Proc. of the Feldafing Summer School, 7–18 Sep. 1964.
Edited by Jürgen Aschoff.
Amsterdam, North-Holland Publishing Co., 1965, p. 277–297. 17 refs.

Analysis of the Drosophila pupal eclosion rhythm was taken as a model of entrainment for a discussion of the phase response curves and the phase of the rhythm in various entrained steady states. In this case, the phase shift necessary in each cycle of the steady-state to maintain the interval between phase-reference points is equal to the period of the driving cycle. The general properties of this model have been explored on a computer, varying several features of the general pattern, which all response curves display. Some generalizations, which could be derived from the study, are discussed.

A66-80540
ON THE PERSISTENCE OF CIRCADIAN RHYTHMS IN HIBERNATING MAMMALS.
M. C. Saint Girons (Museum Natl. d'Hist. Naturelle, Lab. d'Ecol., Brunoy, Seine et Oise, France).
IN: CIRCADIAN CLOCKS; Proc. of the Feldafing Summer School, 7–18 Sep. 1964.
Edited by Jürgen Aschoff.
Amsterdam, North-Holland Publishing Co., 1965, p. 321–323. 5 refs.

After analysis of time and duration of the spontaneous arousals during hibernation, one may conclude that in normal conditions of light and temperature, the circadian clock continues to function in the hibernating garden dormouse, Eliomys quercinus. It continues to function also when the animals are kept in complete darkness and at a constant temperature. This persistence of the activity rhythm is also found in other European hibernating rodents such as Glis glis, Muscardinus avellanarius and Dryomys nitedula.

A66-80541
PHOTOPERIODISM IN PLANTS AS RELATED TO CIRCADIAN SYSTEMS.
Karl C. Hamner (Calif. U., Dept. of Botany, Los Angeles).
IN: CIRCADIAN CLOCKS; Proc. of the Feldafing Summer School, 7–18 Sep. 1964.
Edited by Jürgen Aschoff.
Amsterdam, North-Holland Publishing Co., 1965, p. 331–332.

Seedlings were grown at constant temperature and continuous light for four days followed by a dark period, then were returned to continuous light. The following conclusions concerning time measurement during the inductive dark period can be made: (1) An "hour glass" component, which is extremely sensitive to temperature, was involved in all of the responses. (2) The "light-on" signal caused an endogenous circadian rhythm of sensitivity to red light which may be involved in timing. (3) The "light-off" signal may initiate another independent endogenous circadian rhythm of sensitivity to red light. (4) When both endogenous rhythms were involved in the response, the resulting effect is a simple addition of the effectiveness of the two independent circadian rhythms. (5) The main light period, which precedes the inductive dark period, determined the basic endogenous rhythm of sensitivity during the dark period, and a brief perturbation by light during the dark period did not greatly change this basic rhythm but simply reacted with it. In order

for a light interruption to induce a basic endogenous rhythm, the light period must be of more than two hours duration and maximum response was not obtained until the light period was more than ? hr. (6) The pigment, phytochrome, seems to be involved in the sensitivity of the plant to red light at least during the early part of the dark period, but the rate of change of phytochrome from one form to another during the dark period did not seem to be involved in the timing mechanism of the response. The sensitivity to red light seems to involve another pigment in addition to phytochrome. It seems evident that the photoperiodic response of this plant involves a complex of reactions and no simple explanation of photoperiodism is available. It is also evident that the photoperiodic response may be used to study possible mechanisms for circadian rhythms.

A66-80542
CIRCADIAN SYSTEMS IN THE PHOTOPERIODIC RESPONSES OF VERTEBRATES.
Donald S. Farner (Washington State U., Pullman).
IN: CIRCADIAN CLOCKS; Proc. of the Feldafing Summer School, 7–18 Sep. 1964.
Edited by Jürgen Aschoff.
Amsterdam, North-Holland Publishing Co., 1965, p. 357–369. 51 refs.
Grant Natl. Sci. Found. GB 1380.

Although there are established cases of photoperiodic control of annual cycles in all of the major groups of vertebrates, except the elasmobranchs, little attention has been given to the possible role of circadian components of the response system. Only in four species of birds is there not reasonable evidence for the existence of such components.

A66-80543
EXPERIMENTAL MODIFICATIONS OF THE INTERNAL CLOCK IN THE CANARY, STUDIED BY SELF-SELECTION OF LIGHT AND DARKNESS.
G. Wahlström (Uppsala U., Dept. of Pharmacol., Sweden).
IN: CIRCADIAN CLOCKS; Proc. of the Feldafing Summer School, 7–18 Sep. 1964.
Edited by Jürgen Aschoff.
Amsterdam, North-Holland Publishing Co., 1965, p. 324–328. 5 refs.

Normal canaries (Serinus canarius) exposed to self-selected light and dark periods established a regular circadian rhythm within a month. An extra dark period imposed on the birds caused a temporary increase in the activity period. Oral introduction of reserpine increased the rest period. The effect disappeared within four days, after a single dose. Oral administration of triiodothyronine did not decrease, but rather increased the period of circadian rhythm. In some birds functional thyroidectomy by I^{131} shortened the circadian periods.

A66-80544
CIRCADIAN RHYTHM AND THE PHOTOPERIODIC REGULATION OF THE ANNUAL REPRODUCTIVE CYCLE IN BIRDS.
Albert Wolfson (Northwestern U., Evanston, Ill.)
IN: CIRCADIAN CLOCKS; Proc. of the Feldafing Summer School, 7–18 Sep. 1964.
Edited by Jürgen Aschoff.
Amsterdam, North-Holland Publishing Co., 1965, p. 370–378. 10 refs.
Grant NSF GB-1041 and Contract ONR 1228-28.

The results of experiments of light–dark exposure in the male juncos (Junco hyemalis) and bobolinks (Dolychonyx oryzivorus) in group B confirm Hamner's findings in male house finches treated with LD 6:30 and reemphasize the role of light in the progressive phase. The activity patterns also demonstrate clearly the existence of some type of rhythmic phenomenon, or circadian rhythm, which regulates the time of activity in the absence of light. The author discusses relationship between this rhythm and the photoperiodic regulation of the progressive and preparatory phases.

A66-80545
AVIAN PHOTOPERIODIC RESPONCE-RHYTHMS [SIC] : EVIDENCE AND INFERENCE.
William M. Hamner (Calif. U., Los Angeles).
IN: CIRCADIAN CLOCKS; Proc. of the Feldafing Summer School, 7–18 Sep. 1964.
Edited by Jürgen Aschoff.
Amsterdam, North-Holland Publishing Co., 1965, p. 379–384. 8 refs.

The circadian rhythm control of the vernal photoperiodic testicular response was studied in the house finch (Carpodacus mexicanus). The ahemeral cycle experiments indicated that neither the absolute length of the light period nor the length of the dark period are requisites for testicular maturation. Interrupted-night experiments showed a weak photoperiodic stimulus at certain phases. It is suggested that the photoperiodic timing mechanism may utilize the circadian rhythm as a biological clock to temporally regulate the breeding season.

A66-80546
CIRCADIAN RHYTHMS AND PHOTOPERIODISM IN PASSER DOMESTICUS.
Michael Menaker (Tex. U., Austin).
IN: CIRCADIAN CLOCKS; Proc. of the Feldafing Summer School, 7–18 Sep. 1964.
Edited by Jürgen Aschoff.
Amsterdam, North-Holland Publishing Co., 1965, p. 385–395. 12 refs.

Simultaneous measurements of the effects of a series of skeleton photoperiods on the activity rhythm and testicular response were taken on the house sparrow. The results showed that testes weight, the classical photoperiodic system, and the phase of onset of the activity rhythm were modified by the experimental photoperiods.

A66-80547
PHASE SHIFTING OF THE HUMAN CIRCADIAN SYSTEM.
G. T. Hauty and T. Adams (Civil Aeromed. Res. Inst., Oklahoma City, Okla.)
IN: CIRCADIAN CLOCKS; Proc. of the Feldafing Summer School, 7–18 Sep. 1964.
Edited by Jürgen Aschoff.
Amsterdam, North-Holland Publishing Co., 1965, p. 413–425. 12 refs.

Studies on biological assessment of a reference of biological time to standard time were conducted on human subjects flying jet planes between Tokyo and Oklahoma City. Inspection of curves prepared for each individual subject showed: (1) As indicated by the plottings of mean rectal temperatures, three to five days were required for the primary shifting of phase and one day for the shift in phase back to its original relationships. (2) Inter-individual differences in lag time were profound in that a completed phase shift was evidenced on the first day in Tokyo by one subject while at the other extreme, another subject did not demonstrate a normal phase shift on any of the days in Tokyo. (3) Behavioral integrity was degraded during the transitional period in Tokyo and, to a lesser extent, during the period of transition back to the environment of origin.

A66-80548
THE DEMONSTRATION AND MANIPULATION OF A CIRCADIAN RHYTHM IN A SINGLE-NEURON.
Felix Strumwasser (Calif. Inst. of Technol., Div. of Biol., Pasadena).
IN: CIRCADIAN CLOCKS; Proc. of the Feldafing Summer School, 7–18 Sep. 1964.
Edited by Jürgen Aschoff.
Amsterdam, North-Holland Publishing Co., 1965, p. 442–462. 11 refs.
Contracts AF 39(638)-1447 and DA-49-193-MD-2119.

The circadian rhythm was studied in one identifiable neuron on the dorsal surface of the parieto-visceral ganglion isolated from sea hares which had been exposed to light–dark cycles of various duration. Regardless of different form, the spike output of the micropotentials indicated a circadian rhythm of the cell. No synchronization was noted between the same cell of different specimens. The plotted curves, however, showed a parabolic character. The possibility of a peripheral pacemaker or involvement of a hormone must be ruled out under the conditions of the experiment. Other experiments showed that the cell possesses a two-week lunar rhythm, which was expressed as a modulation timing of the activity peak. A change in D-L transition of the light schedule caused an overshooting response which could be stabilized by 2-D trials. The effects of hyperpolatization, application of heat, and injections of actinomycin D are also described. One type of model is discussed.

A66-80549
CLOCK-MECHANISMS IN CELESTIAL ORIENTATION OF ANIMALS.
Klaus Hoffman (Max-Planck-Inst. für Verhaltensphysiol., Seewiesen und Erling-Andechs, Germany).
IN: CIRCADIAN CLOCKS; Proc. of the Feldafing Summer School, 7–18 Sep. 1964.
Edited by Jürgen Aschoff.
Amsterdam, North-Holland Publishing Co., 1965, p. 426–441. 59 refs.

The author discusses the nature of the physiological clocks involved in compensation for the movements of celestial bodies in animal space orientation and the demands on the time mechanisms, which have to be postulated with regard to some current hypotheses on bicoordinate celestial navigation in birds.

A66-80550
BIOLOGICAL RHYTHM RESEARCH.
A. Sollberger (Highland View Hosp., Metab. Ward, Cleveland, Ohio).
Amsterdam, The Netherlands, Elsevier Publishing Co., 1965, xx+ 461 p.
Refs. $25.00.

The author discusses all types of endogenous, exogenous, and external physical rhythms, defines their basic properties, and points out the importance of this comparatively new phase of science in the study of biology, physiology, and medical sciences. He also presents some models and mathematical-statistical analyses of rhythms, and the possibility of their control.

A66-80551
TEMPORAL FACTORS IN PATTERN VISION.
Adriana Fiorentini and D. M. Mackay (Inst. of Optics, Florence; and Keele U., Dept. of Commun., Great Britain).
(Exptl. Psychol. Soc., Meeting, Oxford, Jul. 10, 1964).
Quarterly Journal of Experimental Psychology, vol. 17, Nov. 1965, p. 282–291. 8 refs.

A sequence of uncorrelated randomly patterned visual stimuli ("visual noise") is normally seen as a field of particles in "Brownian motion". When each frame of the sequence is followed by a blank flash superimposed on the same region of the visual field, the apparent structure of the noise field is strikingly altered, its form varying with the time interval between frame and flash. At a critical interval, many dots seem to cohere, to form maggot-like objects. Some of the factors determining this critical interval have been studied. They include the brightness, repetition frequency, and exposure duration of the noise field, and the distance of its retinal image from the fovea. The critical interval for "perceptual blanking" is quite different from that for the "maggot-effect", but the two show a suggestively similar dependence upon the duty cycle of the noise display. It is of some neurological interest that the phenomenon is not appreciably visible with dichoptic mixing of noise and blank stimuli.

A66-80552
THE SIZE-CONSTANCY OF UNDERWATER SWIMMERS.
Helen E. Ross (Cambridge U., Psychol. Lab., Great Britain).
Quarterly Journal of Experimental Psychology, vol. 17, Nov. 1965, p. 329–337. 16 refs.

The size-constancy of divers was measured by requiring them to adjust the distance between two disks of unequal size so that they appeared phenomenally equal. In clear water, divers showed greater constancy-ratios than on land. In murky water, where visibility was reduced by suspended particles, constancy-ratios were the same as, or less than, on land. It is suggested that these effects may be due to changes in apparent distance: in clear water, objects appear nearer through refraction, but in murky water they appear further away because of the distance cues provided by the visibility gradient. The orientation of the display, or of the diver's body, did not affect constancy under water, though it does on land. It is argued that the effect on land is due to visual and proprioceptive cues which are absent in the water.

A66-80553
RENAL CHANGES ASSOCIATED WITH ACCLIMATIZATION TO HIGH ALTITUDE.
Paul Gibbons Roofe and Gerald F. Garrett (Kan. U., Dept. of Anat., Kansas City and Lawrence).
Anatomical Record, vol. 153, Nov. 1965, p. 311–315. 7 refs.
Grant NIH NB-04992-04.

White rats were exposed to atmospheric pressures equivalent to 18,000 feet altitude for approximately 24 hours a day for as long as four months. Ratio between glomeruli and non-glomerular cortical tissue was determined using the Chalkley technique. Mean cross-sectional glomerular area was determined using a delineascope projection method. Conclusions reached as a result of this study are: (1) A decrease in kidney weight per 100 gm. body weight was observed in altitude-acclimatized rats compared to ground level control animals. Kidneys of rats at high altitudes weighed 15 % ± 2.9 % less than controls. (2) A decrease in the amount of non-glomerular tissue per glomerulus was noted in animals at high altitude. (3) A decrease in mean glomerular area was observed in animals at high altitudes. Since no gross change in volume of renal cortex was observed during acclimatization, the conclusion is drawn from this information that during altitude acclimatization an increase in total number of functioning nephrons occurs.

A66-80554
THE SITE OF PULMONARY VASOMOTOR ACTIVITY DURING HYPOXIA OR SEROTONIN ADMINISTRATION.
Marvin A. Sackner, Donald H. Will, and Arthur B. DuBois (Pa. U., School of Med., Graduate Div., Dept. of Physiol., Philadelphia).
Journal of Clinical Investigation, vol. 45, Jan. 1966, p. 112–121. 30 refs.
Grants PHS H4797 and H7397.

The site of action of hypoxia or serotonin administration was investigated in dogs. During hypoxia, either a rise or fall in pulmonary vascular resistance may occur. The rise in pulmonary vascular resistance is associated with a significant decrease in pulmonary arterial blood volume, and, hence, constriction of the greater portion if not the entire pulmonary arterial tree must take place. There probably is concomitant venous vasodilation, which might be of an active nature. A fall in pulmonary vascular resistance during hypoxia was associated with passive dilatation of the pulmonary arterial tree. An analysis of the pressure-volume and the conductance-volume relationships of the pulmonary circulation indicates that pulmonary arterial vasoconstriction occurs in both types of responses. Serotonin produced pronounced arterial vasoconstriction and probably a lesser amount of venous constriction. These studies indicate that significant vasomotor activity is present throughout the pulmonary arterial tree, rather than confined to the arterioles as in the systemic circulation.

A66-80555
CIRCULATORY EFFECTS OF STIMULATING THE CAROTID ARTERIAL STRETCH RECEPTORS IN MAN AT REST AND DURING EXERCISE.
B. Sture Bevegard and John T. Shepherd (Mayo Clin. and Mayo Found., Sect. of Physiol., Rochester, Minn.)
Journal of Clinical Investigation, vol. 45, Jan. 1966, p. 132–142. 20 refs.
Grant NIH HE-05883

The carotid arterial stretch receptors were stimulated in six normal subjects by application of sub-atmospheric pressures. The circulatory effects were studied at rest and during graded supine leg exercise. A small but significant reduction in cardiac output as well as a dilatation of resistance vessels in the limbs contributed to the decrease in arterial pressure both at rest and during graded exercise. There was no evidence that carotid sinus stimulation caused venodilatation in the forearm either at rest or during exercise when venous tone was increased. During exercise, stimulation of the carotid arterial stretch receptors caused reductions in heart rate and blood pressure of the same absolute magnitude as at rest regardless of the initial levels of arterial blood pressure and heart rate.

A66-80556
THE PROTECTIVE EFFECT OF HYPERBARIC OXYGENATION IN CEREBRAL ANOXIA.
Robert E. Whalen, Albert Heyman, and Herbert Saltzman (Duke U. Med. Center, Dept. of Med., Div. of Neurol. and Cardiovascular Lab., Durham, N. C.)
(Am. Neurol. Assoc., Atlantic City, N. J., Jun. 1964).
Archives of Neurology, vol. 14, Jan. 1966, p. 15–20. 8 refs.
N. C. and Am. Heart Assocs. and Council for Tobacco Res. supported research.
Grants PHS HE-07896, HE-07563, and NB-00669.

The length of time for the electroencephalogram to become flat and featureless following either ventricular fibrillation or 100 % nitrogen inhalation was determined in normothermic and hypothermic dogs respired with oxygen at 1 and 3.04 atm. before the initiation of fibrillation or nitrogen inhalation. The electroencephalogram flattening time was consistently prolonged in dogs at 3.04 atm. when compared to values obtained in the same dog at 1 atm. Hypothermia potentiated the prolongation of electroencephalographic activity noted under hyperbaric conditions.

A66-80557
CELL AND SOLUTION VELOCITY CONSTANTS FOR THE REACTION CO + Hb → COHb AT DIFFERENT TEMPERATURES IN MAMMALS WITH DIFFERENT RED CELL SIZES.
Robert A. B. Holland (New South Wales U., School of Physiol., Kensington, New South Wales, Australia).
Journal of General Physiology, vol. 49, Nov. 1965, p. 199–220. 26 refs.
Natl. Heart Found., Australia supported research.

Using a double beam stopped-flow apparatus, measurements were made of the velocity constant of the reaction CO + Hb → COHb in solution and in the red cells of human beings, rabbits, horses, and goats. The solution constant (l') at 37° C for human beings was 362 $mm.^{-1}$ $sec.^{-1}$; in other species l' was somewhat lower. Two rabbits, despite having apparently identical hemoglobins, had significantly different values for l'. The energy of activation (E) of l' was between 8 and 11 kcal/mole in all cases. The cell reaction constant (l_c) at 37° was between 61 and 73 $mm.^{-1}$ $sec.^{-1}$ in all cases; at 37° the trend was for the smaller cells to have the higher l_c. This cell size effect was much less than previously found for the faster oxygen reaction. This showed that by merely increasing the rate of chemical reaction, it was not possible to increase cell uptake rate beyond a certain level, this level being dependent on the size and membrane properties of the cell. At lower temperatures, l' was a more important factor in determining l_c than was cell size. The cell membrane was a barrier to gas diffusion in all species. The effect of temperature on l_c was also measured and was less than its effect on l' at most temperatures. Temperature effect increased in small cells at low temperatures. Both these findings are in accordance with predictions based on differentiation of Roughton's equations.

A66-80558
EFFECTS OF IMMERSION, RECUMBENCY AND ACTIVITY ON ORTHOSTATIC TOLERANCE.
Daniel E. Torphy (USAF School of Aerospace Med., Biodyn. Branch, Acceleration Sect., Brooks AFB, Tex.)
Aerospace Medicine, vol. 37, Feb. 1966, p. 119–124. 20 refs.

The effects of water immersion for six hours without negative breathing pressures were studied in five subjects. Control conditions of normal activity and bed rest with and without activity were also studied to delineate the separate effects, if any, of activity, recumbency and immersion. Heart rate during the separate conditions as well as resting and tilted blood pressures were measured and statistically analyzed. No statistically significant decrement in heart rate and blood pressure response to tilting was found, although immersion resulted in a tendency toward increased heart rate and blood pressures as well as greater narrowing of pulse pressure with tilting. The deficiencies of tilt table testing are discussed and findings on tilt angle and parameters dependent on degree of orthostatic stress presented.

A66-80559
VALIDITY OF A BRIEF VESTIBULAR DISORIENTATION TEST IN SCREENING PILOT TRAINEES.
Rosalie K. Ambler and Fred E. Guedry, Jr. (U. S. Naval School of Aviation Med., Pensacola, Fla.)
(Aerospace Med. Assoc., 36th Ann. Meeting, New York City, Apr. 27, 1965).
Aerospace Medicine, vol. 37, Feb. 1966, p. 124–126. 11 refs.

Two hundred and twenty-six naval aviation trainees were administered the Brief Vestibular Disorientation Test (BVDT) during the latter part of their pre-flight training. After the subjects had had the opportunity either to complete training or separate therefrom, the test results were evaluated for their relation to the following criteria: (1) students separated from flight training for all causes vs. completions; (2) tension and/or airsick separations vs. all others; and (3) airsick separations vs. all others. Results indicated that relationships existed between high sensitivity scores on the BVDT and membership in the various separation groups. The airsick separation group had the highest mean BVDT sensitivity score. Statistical evidence indicated that the BVDT ratings tapped a significant portion of the flight criterion variance not reached by the present flight aptitude tests.

A66-80560
PHYSIOLOGICAL REACTIONS OF THE HUMAN BODY TO TRANSVERSE ACCELERATION AND SOME MEANS OF INCREASING THE ORGANISM'S RESISTANCE TO THESE EFFECTS.
A. S. Barer, G. A. Golov, V. B. Subavin, K. I. Murakchovski, S. A. Rodin, E. I. Sorokina, and E. P. Tikchomirov (USSR, Acad. of Sci., Moscow).
Aerospace Medicine, vol. 37, Feb. 1966, p. 127–133. 20 refs.

Flight in a space vehicle is accompanied by the effects of exposure of the subject to different accelerations. Prolonged acceleration appears during the start and at the re-entry of the space vehicle into the earth's atmosphere. It also can occur during maneuvers while in flight. Three general groups of experiments are described. The first group considers the limits of human tolerance to prolonged forward acceleration at an angle of 65° to the longitudinal axis of the body. The second group includes tests of different methods whereby human tolerance to transverse acceleration might be increased. The third group contains investigations in which the tolerance to acceleration was determined in time under selected optimal conditions. Detailed records and data were obtained during each experiment on certain physiological functions of the human body. Complete analysis of these data are discussed. Although estimates were made in this study of methods for increasing resistance of the human being to prolonged acceleration stress, and limits of tolerance to this stress were established, unanswered questions still remain regarding the reaction of the organism to stress. Detailed analyses of the questions raised are considered. Physiological responses of the human being to these stresses are considered in light of the experimental data.

A66-80561
TOLERANCE TO SPINNING IN EJECTION ESCAPE.
D. E. Courts (Lockheed-Calif. Co., Burbank).
Aerospace Medicine, vol. 37, Feb. 1966, p. 133–135.

Some modern-day ejection systems employ a small stabilizing parachute which introduces a spin to the man-seat package during descent. In this study, spin rates of 30 to 90 r.p.m. for four minutes were duplicated, using eight human subjects in an effort to ascertain whether temporary incapacitation would occur which would compromise a safe parachute landing. Reaction to spinning was determined by subjective complaints of nausea and dizziness and objective identification of nystagmus. Careful examination of the subjects' faces was conducted for evidence of swelling, petechial hemorrhages, and conjunctivitis. Results of the testing revealed that the design characteristics of the ejection system under study minimize the possibility of incapacitation.

A66-80562
OBJECTIVE DETERMINATIONS OF BONE CALCIUM LEVELS.
John M. Dick (Douglas Aircraft Co., Los Angeles, Calif.)
Aerospace Medicine, vol. 37, Feb. 1966, p. 136–139. 14 refs.

A study was conducted to determine the amount of bone calcium loss during two weeks of simulated weightlessness. Urine calcium levels were determined at the beginning and the end of the test. X-ray films utilizing the wedge technique were also taken of the os calcis at these same times. A net loss of approximately 2 g. of urinary calcium was noted during this period. The X-ray wedge technique did note a change in the os calcis, but it is questionable if such a slight change is statistically significant. It was concluded from this study that the calcium loss that would be incurred by two weeks of weightlessness would be minimal. If one extrapolates the above data, it is estimated that 6 to 12 months exposure can be safely tolerated without any detrimental or permanently damaging effects.

A66-80563
DISORIENTATION EXPERIENCES OF ARMY HELICOPTER PILOTS.
Frank W. Ogden, Quitman W. Jones, and Harold R. Chappell (USA BAAR, and U. S. Army Aeromed. Res. Unit, Fort Rucker, Ala.)
Aerospace Medicine, vol. 37, Feb. 1966, p. 140–143. 13 refs.

Thirty-six accidents in which disorientation played a role are compared with the experience of 350 aviators who did not have accidents due to disorientation. Disorientation occurred in only 3.4 % of major accidents yet 30.7 % of the fatalities are in this group. Forty-three persons (38.5 %) died in these accidents. Most of the aviators in these accidents had low levels of experience, and only 13 % had instrument training. Of 350 aviators interviewed and/or completing a questionnaire, two-thirds had experienced disorientation an average of two and one-half times during their careers. Most of these occurred at night or in adverse weather conditions. To avert accidents, they were able to give the aircraft control to another pilot, rely on their instruments until the feeling passed, or else regained visual contact with the ground before completely losing control of the aircraft. Present instruments are unsatisfactory in aircraft with multidirectional capabilities, such as helicopters. Therefore, more training is necessary and instruments designed to meet the special characteristics of rotary wing aircraft must be developed.

A66-80564
INTERACTION OF LINEAR AND ANGULAR ACCELERATIONS ON VESTIBULAR RECEPTORS IN MAN.
A. J. Benson and M. A. Bodin (Roy. AF Inst. of Aviation Med., Farnborough, Hants, Great Britain).
(Aerospace Med. Assoc. Meeting, New York, Apr. 29, 1965).
Aerospace Medicine, vol. 37, Feb. 1966, p. 144–154. 35 refs.

A 1 g rotating linear acceleration vector, produced by rotation about a horizontal cephalo-caudal axis, was found to produce compensatory nystagmus for as long as rotation continued. The velocity of the slow phase of nystagmus showed a cyclical modulation, the amplitude of which increased with the speed of rotation. Following rotation about a horizontal axis, the after-sensations were all but abolished and the time constant of decay of post-rotational nystagmus was consistently shorter than when the axis of rotation was vertical. A hypothesis is presented which attempts to explain these findings by the direct action of the linear acceleration on the canal system; however, it is not possible to exclude otolithic mechanisms.

A66-80565
SYNCOPE INDUCED BY APPLICATION OF NEGATIVE PRESSURE TO THE LOWER BODY AND ITS EFFECT ON LUNG CO DIFFUSING CAPACITY.
D. B. Shaw, F. Cinkotai, and M. L. Thomson (London School of Hyg. and Trop. Med., Dept. of Occupational Health and Appl. Physiol., Great Britain).
Aerospace Medicine, vol. 37, Feb. 1966, p. 154–157. 19 refs.

Application of negative pressure of –70 cm. H_2O to the lower half of the body in 9 healthy human volunteers induced progressive changes in all subjects, which appeared to be typical of vasovagal syncope. The subjects withstood the strain for 7 to 17 min.; atmospheric pressure was restored in time to prevent loss of consciousness in most individuals. Heart rate rose steadily to maxima between 110–114/min., then fell precipitously to normal or subnormal levels one or two min. before fainting. In all subjects the pulmonary diffusing capacity for carbon monoxide (D_{LCO}) fell by 12.5 % on the average during the first six min. of negative pressure, then rose towards control levels in 5 of the 7 subjects who had tolerated the strain thus far; it was within normal limits in all subjects 8 min. after removal of the strain. The circumference of the upper arm fell progressively until the pressure was restored. One experiment using radio-active xenon (^{133}Xe) indicated that there was an increase in the perfusion gradient down the lung during the negative pressure phase. The application of reduced pressure to the lower body should provide a safe, rapid method for studying individual resistance to vasovagal syncope and possibly to the strain of positive acceleration.

A66-80566
EFFECTS OF VIBRATION ON THE ENDOCRINE SYSTEM OF MALE AND FEMALE RATS.
Arthur M. Sackler and A. Stanley Weltman (Long Island U., Brooklyn Coll. of Pharm., Res. Inst., Labs. for Therap. Res., Brooklyn, N. Y.)
Aerospace Medicine, vol. 37, Feb. 1966, p. 158–166. 40 refs.

This investigation reports the acute and prolonged effects of low-gravity vibration stress on body weights, growth, food metabolism, white blood cells and the endocrine system of albino, Wistar rats. Male and female test groups were subjected to peak acceleration forces of 2.1 g for 15- or 30-minute intervals administered daily during a 3-week period. The reciprocating shaker produced a horizontal movement having an amplitude of 4.6 cm. and a frequency of 283 cycles/min. Depending upon the degree and duration of the vibratory stress as well as sex-related resistance factors, significant and/or pronounced decreases were noted in the body weights, body weight gains, food consumption, leukocyte counts, absolute liver, kidney, spleen, thymus and seminal vesicle weights of the male rats. Corresponding significant increases were noted in the adrenal weights. In the females, vibration stress produced less pronounced effects. However, somewhat similar changes were also observed in the leukocyte counts and absolute, splenic, thymic and adrenal weights. In both sexes, the degree of change tended to diminish during the 2nd and 3rd weeks of stress indicating adaptation and

acclimatization to vibration. In males, the data indicate that vibration produces changes typical of nonspecific stress in that it stimulates adrenal function even as it may inhibit body growth and gonadal function. The greater resistance of female rats to vibration stress modified and reduced the extent of body growth, food utilization and endocrinal alterations.

A66-80567
AEROMEDICAL FACTORS OF TITAN II ICBM SUPPORT: A SUMMARY OF TWO YEARS' OPERATIONAL EXPERIENCE.
Charles H. Sawyer, Emory J. Sobiesk, and Burton Jay (303d Med. Group, Davis-Monthan AFB, Ariz.).
Aerospace Medicine, vol. 37, Feb. 1966, p. 167–172.

Aeromedical procedures developed to support the lead Titan II Intercontinental Ballistic Missile Wing composed of 18 dispersed complexes are discussed. Mishap experience including a serious nitrogen tetroxide burn with associated chemical pneumonitis is reported. Human factors in combat missile crew duty with emphasis on fatigue, noise, and nutrition are discussed. Propellant transfer experience with the USAF Rocket Fuel Handlers Clothing Outfit is summarized. The results of 2939 preplacement and periodic propellant handler physicals are included. Experience gained in this missile program is referenced to future Titan II medical support requirements as well as other advanced weapon system developmental programs.

A66-80568
INTERACTIONS BETWEEN OPTOKINETIC AND VESTIBULO-OCULAR RESPONSES DURING HEAD ROTATION IN VARIOUS PLANES.
G. Melvill Jones (McGill U., Dept. of Physiol., Can. Defence Res. Board Aviation Med. Res. Unit, Montreal, Canada).
Aerospace Medicine, vol. 37, Feb. 1966, p. 172–177. 9 refs.

Subjects were accelerated on an electronically controlled turntable to a chosen angular velocity which was then maintained constant for 3 minutes and finally decelerated to a standstill. They either had their heads tilted backwards, or sideways, at 45° to the vertical axis of the turntable. Thus they were simultaneously exposed to equal angular velocity stimuli in the skull planes either of yaw and roll, or of yaw and pitch. The eyes were open and looking at an appropriate stationary optokinetic stimulator. Measurement of compensatory eye angular velocities in the relevant planes with a movie-photographic technique revealed very poor optokinetic following in the roll plane and hence wide dissociation of oculomotor responses in yaw and roll. In yaw and pitch the components of eye angular velocity were always equal to one another, despite failure (often gross) to reach the numerical value required for visual fixation. In the latter case, therefore, ocular compensation always tended to parallel that of the rotational stimulus, despite failure to achieve visual fixation. A number of applied implications are adduced.

A66-80569
ALTERNOBARIC VERTIGO AMONG PILOTS.
Claes E. G. Lundgren and Lars U. Malm (Lund, U., Inst. of Physiol., Lab. of Aviation Med., Sweden).
Aerospace Medicine, vol. 37, Feb. 1966, p. 178–180. 5 refs.

The occurrence of alternobaric vertigo--vertigo due to pressure changes in the middle ears--was studied by means of interviews of 100 Swedish RAF pilots. The findings are presented as statistically analyzed data and case reports. The incidence of vertigo was higher than in an earlier investigation. A positive correlation was found between colds, mismanagement of colds, difficulties in pressure equalization of the middle ears and the occurrence of vertigo. Information is given which stresses the risks connected with alternobaric vertigo in flying.

A66-80570
SUPPRESSION OF MOTION SICKNESS BY THIETHYLPERAZINE (TORECAN).
W. H. Johnson and F. E. Ireland (Toronto, U., Banting Inst., Dept. of Otolaryngol., Canada).
Aerospace Medicine, vol. 37, Feb. 1966, p. 181–183. 8 refs.

It is sometimes forgotten that the primary cause of motion sickness is motion, although many stimuli may contribute to its incidence. Because of the importance of the non-auditory labyrinth in the etiology of motion sickness, it is reasonable to assume that any chemical compound which suppresses vestibular response is likely also to be of value in the prevention of motion sickness. Since it has already been established that thiethylperazine does suppress the nystagmus and vertigo resulting from strong semicircular stimulation, it was considered an appropriate compound to test for its possible effectiveness in the prevention of motion sickness. It was found that the drug is an effective anti-nauseant for the prevention of motion sickness.

A66-80571
MYOCARDIAL INFARCTION AFTER GASTROINTESTINAL ACUTE HEMORRHAGE.
Carlos Bernardes and Oscar Petersen (Varig Airlines Med. Dept., Porto Alegre, Rio Grande do Sul, Brazil).
Aerospace Medicine, vol. 37, Feb. 1966, p. 183–185.

The authors present a case of a myocardial infarction on a commercial pilot after an acute gastrointestinal hemorrhage. After a thorough discussion of the case, they suggest that a complete medical check-up be made on any crew member who suffers a major trauma.

A66-80572
NEW THERAPY OF MOTION SICKNESS.
Paul F. Stebbins (U. S. Naval Air Sta. FPO, San Francisco, Calif.)
Aerospace Medicine, vol. 37, Feb. 1966, p. 186.

Motion sickness is associated with fear which produces decreased motility of the gastrointestinal system. Treatment with Urecholine Bethanechol chloride) aimed at increasing intestinal motility has been found to be successful in the relief of motion sickness symptoms.

A66-80573
HUMAN CENTRIFUGE STUDIES ON THE RELATIVE EFFECTIVENESS OF SOME ANTIMOTION SICKNESS DRUGS.
Charles D. Wood, Ashton Graybiel, and Robert McDonough (Naval School of Aviation Med., Pensacola, Fla.).
Aerospace Medicine, vol. 37, Feb. 1966, p. 187–190. 19 refs.

A series of antimotion sickness drugs was evaluated on the human centrifuge at the Navy School of Aviation Medicine. The procedures used enabled the same stimulus to be applied to the individual subjects through the series of drug tests. A combination of hyoscine and d-amphetamine was found to be the most effective preparation. Hyoscine alone was the most effective single drug followed by d-amphetamine and meclizine. Prochlorperazine was slightly effective, but chlorpromazine, thiethylperazine, and trimethobenzamide were ineffective. Hyoscine alone produced pronounced drowsiness. The combination with d-amphetamine relieved this side effect but not the vertigo and dry mouth. The advantages of the human centrifuge in the testing of antimotion sickness drugs are pointed out.

A66-80574
DIURNAL PERIODICITY IN THE METABOLIC ACTIVITY OF BONE TISSUE.
David J. Simmons and George Nichols, Jr. (Argonne Natl. Lab., Radiol. Phys. Div., Argonne, Ill.; and Harvard Med. School, Dept. of Med., Boston, Mass.).
American Journal of Physiology, vol. 210, Feb. 1966, p. 411–418. 39 refs.
AEC supported research.
Grant NIH AM 00954(C9).

Studies of the metabolism of bone cells in the metaphyses of the rat femur (distal) and tibia (proximal) have established that collagen synthesis and new bone formation is diurnally regulated. Significantly greater amounts of glycine-2-C^{14} were initially incorporated by osteogenic cells in vivo during the environmental light period (ELP: 09:00–21:00) than during the environmental dark period (EDP: 21:00–09:00). "Spot checks" of the metabolism of rat metaphyseal bone chips were made at the hours when the in vivo differences were most marked. The cells in bone incubated in vitro during the ELP (1000) exhibited a significantly greater uptake of glycine-1-C^{14}, RNA concentrations, and rate of collagen formation than cells incubated during the EDP (0300). Cell DNA concentrations were constant at these hours. Cell lactate production (tibias) and calcium concentrations in the incubation medium (femurs-tibias) were also higher at 10:00-the hour of peak osteoclast frequency in histologic preparations. It was concluded that the period of most intense metaphyseal bone remodeling in rats occurred early during the ELP.

A66-80575
EXCITATION OF THE PERIPHERAL RETINA WITH COINCIDENT AND DISPARATE TEST FIELDS.
Ernst Wolf and Michael J. Zigler (Retina Found., Dept. of Clin. Eye Res., Boston; and Wellesley Coll., Res. Lab., Wellesley, Mass.).
Journal of the Optical Society of America, vol. 55, Nov. 1965, p. 1517–1519. 5 refs.
Grant Natl. Inst. of Neurol. Diseases and Blindness B-1482.

Rectangular test fields 1/2° X 2°, with long dimension horizontal and vertical, were presented 10° from fixation on the horizontal and vertical meridian of the visual field. Threshold luminances were determined for each eye singly, and for both eyes when the retinal images were coincident or disparate. In the lateral visual field, binocular thresholds for coincident images were lower than when they were disparate. On the vertical meridian, binocular summation of coincident images is insignificant or totally absent. If, however, in this retinal location the images are disparate and the image in one eye falls to one side of the median line, summation occurs. It is thought that binocular summation is a function of the transmission of impulses from both eyes to the same cortical area of the same cerebral hemisphere.

A66-80576
MEASUREMENT OF MUSCLE TREMOR ASSOCIATED WITH HAND-HELD FIELD GLASSES.

H. A. W. Schober and U. M. Miller (Munich, U., Inst. of Med. Optics, West Germany).
Journal of the Optical Society of America, vol. 55, Nov. 1965, p. 1520–1527.
Bavarian Min. of Com. and the Deut. Forschungsgemeinschaft supported research.

Muscle tremor limits the resolution of hand-held field glasses. All mechanical or optical compensations of tremor movements depend on its spectral frequency distribution. The spectral frequency distribution was recorded for 22 emmetropic observers between 18 and 36 years of age. Two different groups of nearly the same size were identified. The first one supplied spectra marked by only a few sharp maxima, the positions of which were constant over long periods and characteristic for each observer. The exist in all cases in the intervals 1.3–1.7, 2.7–3.5, and 6–11 c.p.s. Only tremor frequencies less than 20 c.p.s. are of practical importance. Other factors, such as weight and shape of the instrument, luminance level, and structure of the visual field, are of less significant influence.

A66-80577
TEMPORAL SUMMATION OF POSITIVE AND NEGATIVE FLASHES IN THE VISUAL SYSTEM.
Mitsuo Ikeda (Minolta Camera Res. Lab., Daisen-Nishimachi, Sakai, Japan).
Journal of the Optical Society of America, vol. 55, Nov. 1965, p. 1527–1534. 11 refs.
Grant NIH NB-C0624.

Temporal summation characteristics of the human eye have been studied by various authors by measuring the increment threshold when two test stimuli are presented successively. Among other things, some have observed an inhibition between the effects of two flashes for a certain inter-flash interval and others have not. Here a similar experiment is carried out with a red test stimulus superposed upon a red adapting field. Inhibition is observed at an interval of 52 or 70 msec., depending on the adapting level. Such an inhibition is also found when two stimuli are both negative. The introduction of a negative test stimulus into the double-flash, increment-threshold technique is a new aspect of the present work. With the new aspect, some new phenomena are observed, particularly, that a positive and a negative flash summate with each other at the interval where double positive or double negative flashes yield inhibition. The luminance ratio of the two stimuli (positive or negative) was freely adjusted and new information concerning the linearity of the summation was obtained. Based on these findings, hypothetical response-potential functions have been derived, which are assumed to be responses in the visual system at some peripheral level.

A66-80578
VISUALLY EVOKED RESPONSE CORRELATES OF PERCEPTUAL MASKING AND ENHANCEMENT.
E. Donchin and D. B. Lindsley (Calif., U., Brain Res. Inst. and Depts. of Psychol. and Physiol., Los Angeles).
Electroencephalography and Clinical Neurophysiology, vol. 19, Oct. 1965, p. 325–335. 33 refs.
NASA Contract NsC-623; Contract Nonr 233(32); and Grant NSF GB-1144.

Average evoked cortical potentials to pairs of flash stimuli were studied in five subjects under conditions favoring: (1) perception of two flashes, (2) brightness enhancement of the first flash by the second, and (3) masking of the first flash by the second. The critical point for these perceptual phenomena is determined by the following parameters of the flash stimuli: the luminance level, the ratio of the luminances of the two flashes, and their durations. For all interflash intervals in the brightness enhancement range the evoked response to paired flashes was approximately a linear sum of the responses to the two flashes when presented alone. In the masking range after subtraction of the response to the lighter second flash the residual shows no detectable response to the test flash. Retroactive brightness enhancement seems to represent an interaction between the neural representations of the two flashes, while the masking phenomenon is due to a displacement of the neural response to the test flash by the response to the brighter, second flash and that this interaction occurs prior to the stage at which the average evoked potential is elicited.

A66-80579
CHANGES IN PATTERNS OF THE HUMAN ELECTROENCEPHALOGRAM DURING FLUCTUATIONS OF PERCEPTION OF STABILIZED RETINAL IMAGES.
D. Lehmann, G. W. Beeler, Jr., and D. H. Fender (Calif., U., Brain Res. Inst. and Dept. of Anat., Los Angeles; and Calif. Inst. of Technol., Pasadena.)
Electroencephalography and Clinical Neurophysiology, vol. 19, Oct. 1965, p. 336–343. 20 refs.
Grant NIH NB 03627-03.

Subjective reports of the spontaneous fluctuations of perception of a stabilized retinal image were recorded simultaneously with the subjects' electroencephalogram (EEG). Periods of fade-out of the image showed a high correlation with the occurrence of EEG alpha trains, whereas periods of visibility were correlated with low voltage fast activity. The consideration of motor reaction times and alpha blocking times or latencies to visual stimulation indicates that central processes control the time at which fluctuations of perception of a stabilized retinal image take place. These are not retinal events reflected in the higher levels at later times.

A66-80580
CHANGES IN THE AMPLITUDE OF PHOTICALLY EVOKED POTENTIALS BY A CONDITIONED STIMULUS.
S. T. Kitai, B. Cohen, and F. Morin (Wayne State U., School of Med., Dept. of Anat., Detroit, Mich.).
Electroencephalography and Clinical Neurophysiology, vol. 19, Oct. 1965, p. 344–349. 11 refs.
Grants PHS MH-05799 and NB-00405.

Changes in the amplitude of photically evoked potentials (PEP's) by a conditioning stimulus (CS) were evaluated during pre-conditioning, conditioning, and extinction procedures. A series of tones at the rate of 1/sec. for 10 sec. was the CS and food was the unconditioning stimulus (US). Four cats were prepared with electrodes chronically implanted at cortical and subcortical sites. There was a minimal attenuation of PEPs during preconditioning days. After relatively few conditioning trials, the PEP's were generally attenuated by CS presentation. In the later conditioning trials, attenuation of the PEP's in the visual cortex was most prominent to the initial phase of the 10 sec. CS presentation, whereas attenuation of the PEP's in the hypothalamus predominated in the later phase. In the extinction procedure, this temporal difference disappeared as all attenuation returned to the pre-conditioning level.

A66-80581
HYPERBARIA, HYPAROXIA, AND THE RETINAL AND CEREBRAL VESSELS.
Banks Anderson, Jr. and Herbert A. Saltzman (Duke U. Med. Center, Dept. of Ophthalmol. and Dept. of Med., Durham, N. C.).
(Am. Assoc. for the Study of Headache, Ann. Meeting, New York, Jun. 19, 1965).
Headache, vol. 5, Oct. 1965, p. 73–77. 16 refs.

The caliber of the retinal vessels becomes smaller as the oxygen tension is increased. Decreases in carbon dioxide tension produced by hyperventilation do not affect retinal vessels. Increases in carbon dioxide tension largely prevent the vasoconstrictor effect of hyperoxia and hybaroxia. The retinal vasoconstriction produced by elevated oxygen tensions does not reduce visual acuity or visual field in the absence of central nervous system symptoms. Such retinal vasoconstriction also does not impair retinal functional response to ischemia and under hybaroxic conditions, after intraocular circulatory occlusion vision is actually prolonged. A further prolongation is obtained by the addition of small amounts of carbon dioxide to the inspired oxygen. The onset of hyperbaric "oxygen convulsions" is hastened by similar small amounts of carbon dioxide in the inspired oxygen, suggesting that vasoconstriction may be of protective value. A migraine-like syndrome has been noted following decompression from a hyperbaric environment, and may be the result of oxygen- or bubble-induced vasoconstriction.

A66-80582
LIFE ON MARS.
Francis Jackson and Patrick Moore.
London, Routledge and Kegan Paul, 1965, ix+111 p. 106 refs.

The author reviews the facts available at present on the conditions existing on the planet mars, in order to decide whether human, animal, and plant life, as it is known on earth, would be possible on this planet. His conclusion is that some primitive forms of terrestrial life could survive the martian atmosphere, which has a different composition than the atmosphere surrounding earth. The diurnal variation of martian temperature is more extreme than on earth, and it could be fatal to terrestrial organisms but some could adapt to these rigorous conditions. The possibility of the existence of martian organisms would call for assuming a different biochemical system. The presence of seasonal changes of martian surface coloring suggest the presence of photosynthetic plants, but it is evident that the overall martian surface conditions are not suitable for human life support.

A66-80583
A STUDY OF THE EFFECTS OF IRRELEVANT INFORMATION ON THE SHORT-TERM RETENTION OF RELEVANT INFORMATION.
M. S. Mayzner, S. Adler, A. Cohen, and K. M. Schoenberg (N. Y. U., School of Eng. and Sci., New York).
Journal of Psychology, vol. 61, Nov. 1965, p. 257–262. 10 refs.
Contract Nonr 285(56).

The present study, in a series of five experiments employing 200 subjects, examined the effects of irrelevant information on the short-term retention of relevant information. The basic task involved presenting to the subject a vertical array of either nine digits, nine high-frequency consonants, or nine low-frequency consonants alone, or embedded in increasingly larger matrices of irrelevant digits or high- or low-frequency consonants, and then measuring recall of the relevant items as a function of the number and kind

of irrelevant items. The results clearly showed that for all combinations of relevant–irrelevant matrices (i.e., numbers–numbers, numbers–letters, letters–numbers, letters–letters, etc.) no systematic or significant decrements or increments in performance were found, and it is concluded that the subject is able to attend exclusively to the relevant stimuli.

A66-80584
CHANGES IN INTELLECT WITH AGE: V. DIFFERENTIAL CHANGES AS FUNCTIONS OF TIME INTERVAL AND ORIGINAL SCORE.
Bernard Berkowitz and Russel E. Green (Veterans Admin. Center, Bath; and Rochester, U., Dept. of Psychol., N. Y.).
Journal of Genetic Psychology, vol. 107, Dec. 1965, p. 179–192. 14 refs.

Elderly people derive approximately the same average benefit in subsequent performance increase from being administered an IQ test as do young people. Also in common with young people, there is a tendency for the variability of retest changes in IQ scores to be positively correlated with intelligence. The long-term trend for elderly people is for their scores to decline. This long-term decline tends to be greater for individuals with high IQ than for those with low IQ, at least within the population sampled for this study. The long-term decline occurs during a period in which learning ability for the same tasks is demonstrably not impaired to any significant extent. The long-term decline is probably due to disuse of the skills involved rather than to deterioration in any irreversible sense.

A66-80585
PERSEVERATION LEARNING SET FORMATION TO NON-REWARDED CUES BY NORMAL AND PREVIOUSLY IRRADIATED RHESUS MONKEYS.
A. A. McDowell and W. Lynn Brown (Tex. U., Dept. of Psychol., Austin).
Journal of Genetic Psychology, vol. 107, Dec. 1965, p. 309–311.

Five control and four whole-body irradiated male monkeys served as subjects. The irradiated subjects had been given chronic exposure to fast-neutron radiation more than five years earlier. Each subject was tested 24 trials per day for 16 days on two-trial response-perseveration learning set for nonrewarded cues. The results show significant improvement with practice and significant superiority of the irradiated subjects over the control subjects.

A66-80586
INFLUENCE OF BLOOD PH ON HYPOXIC PULMONARY VASOCONSTRICTION.
Thomas C. Lloyd, Jr. (Western Reserve U., School of Med., Dept. of Physiol., Cleveland, Ohio).
Journal of Applied Physiology, Vol. 21, Mar. 1966, p. 359–364. 17 refs.
Ohio Tuberc. and Health Assoc. and Heart Assoc. supported research.

Alveolar hypoxia caused vasoconstriction in excised dog lobes studied with controlled perfusion and ventilation. Raising perfusate pH 0.2 unit with tris(hydroxymethyl) aminomethane or $NaHCO_3$ eliminated the hypoxic constrictor response produced by an alveolar P_{O_2} of 45 mm. Hg. Re-establishment of the initial pH with lactic acid or hydrochloric acid restored hypoxic reactivity. Graded degrees of hypocapnic alkalosis produced graded degrees of depression of the hypoxic pressor response. Restoration of the control pH with lactic acid during hypocapnia also restored the vascular responsiveness to hypoxia. Similar results were obtained using both blood and plasma perfusion. Changes in vascular reactivity were not the result of alteration of airway resistance or compliance. It is concluded that pH alterations over a range obtainable in pathologic states can profoundly affect any intrinsic pulmonary vascular adjustments that are responses to local oxygen tension.

A66-80587
CHANGES IN VENTILATION AND PULMONARY MECHANICS INDUCED BY HYPERTONIC SODIUM CHLORIDE.
I. Bruderman and S. Rogel (Hadassah U. Hosp., Internal Med. B, Cardiopulmonary Lab., Jerusalem, Israel).
Journal of Applied Physiology, vol. 21, Mar. 1966, p. 393–397. 17 refs.
Hebrew U.-Hadassah Med. School, Jerusalem, Israel supported research.

Ventilation and pulmonary mechanics were studied in supine anesthetized dogs after intravenous administration of 20% NaCl solution. This substance caused transient apnea followed by tachypnea and increased pulmonary resistance without change in lung compliance. Bilateral cervical vagotomy prevented apnea and the increase in pulmonary resistance. Similar experiments were carried out also during artificial respiration. The results did not differ from those during spontaneous respiration. It is suggested that the site of action of the hypertonic solution is within the lungs and its effect is mediated through pulmonary respiratory chemoreflex.

A66-80588
VENTILATORY RESPONSE TO HYPOXIA AND CO_2 FOLLOWING CO_2 EXPOSURE AND $NaHCO_3$ INGESTION.
R. H. Falchuk, T. W. Lamb, and S. M. Tenney (Dartmouth Med. School, Dept. of Physiol., Hanover, N. H.).
Journal of Applied Physiology, vol. 21, Mar. 1966, p. 393–399. 13 refs.
Grants NIH 5T1 HE-02[illegible]-08 and 5T2 HE-5322-04.

The ventilatory responses to hypoxia and CO_2 were studied in three young adult males under normal conditions, following exposure to 5 or 6% CO_2 for 48 hr., and following the ingestion of 50 g. $NaHCO_3$ per day for 3 days. With both respiratory acidosis and metabolic alkalosis, the subjects hypoventilated when breathing room air. In both conditions the CO_2 ventilatory response curves were displaced from the control position to higher P_{CO_2} values on the abscissa, and although the response to small increments of alveolar CO_2 tension was small compared to control, the maximum slopes, at high CO_2 tensions, were as great or greater than control. The hypoxic ventilatory response curve in the two test situations, if compared with control at equivalent $P_{A_{CO_2}}$, showed a diminished response; but if the comparison was made with $P_{A_{CO_2}}$ held at the particular level selected when breathing room air in all cases, then there was no difference. If the interaction of hypoxic and CO_2 stimuli to ventilation was evaluated by comparing the maximal slopes of the CO_2 response curves, the interaction of hypoxia and CO_2 was absent following both CO_2 exposure and bicarbonate ingestion.

A66-80589
MECHANICAL AND CHEMICAL VENTILATORY STIMULUS INTERACTION AT LOW AND HIGH ALTITUDES.
T. W. Lamb, K. H. Falchuk, J. C. Mithoefer, and S. M. Tenney (Dartmouth Med. School, Dept. of Physiol., Hanover, N. H.; and Mary Imogene Bassett Hosp., Cardio-Pulmonary Lab., Cooperstown, N. Y.).
Journal of Applied Physiology, vol. 21, Mar. 1966, p. 399–403. 9 refs.
(Grants NIH 5T1 HE 2[illegible](06) and 5T1 HE 5322(05).

The interaction of mechanical and chemical ventilatory stimuli in supine unanesthetized human subjects was studied at sea level and at high altitude. When graded total-body vibratory stimuli were added to a pre-existing condition of normal alveolar gas tensions, hypoxia, or hypercapnia, a precise multiplicative, or porportional ventilatory response was seen. Conversely, graded increments of alveolar carbon dioxide tension produced by the addition of CO_2 to the inspired air resulted in steeper ventilatory response curves to CO_2 during constant vibration than during rest, and the slopes of these curves were also related in the same precise multiplicative manner. Although the ventilatory response to vibration alone remained almost unchanged after acclimatization at high altitude, the proportionate change in slope of ventilatory response to CO_2 caused by vibration at seal level did not persist. Under all conditions when mechanical stimuli were added to chemical stimuli, a proportionate control was demonstrated, but when CO_2 was added to mechanical stimuli the multiplicative relationship which had been demonstrated at sea level was no longer apparent at high altitude.

A66-80590
NATURE OF VIBRATION HYPERVENTILATION.
T. W. Lamb and S. M. Tenney (Dartmouth Med. School, Dept. of Physiol., Hanover, N. H.).
Journal of Applied Physiology, vol. 21, Mar. 1966, p. 404–410. 19 refs.
Grants NIH HE 2[illegible](06) and 5T1 HE 5322(05).

Total-body vibration in supine, unanesthetized humans was studied at different frequencies up to 6.6 cycles/sec. In roughly one-third of 24 subjects, ventilation increased more than did metabolism, resulting in a lowering of alveolar P_{CO_2}. The fall in $P_{A_{CO_2}}$ was highly reproducible, persistent, and quantitatively related to the intensity of the vibratory stimulus. No isolated anatomical site for reception of the stimulus to ventilation was found. The response seemed rather to depend on the whole experience of vibration. While it could not be inhibited by direct voluntary control, vibration-induced hyperventilation disappeared with light general anesthesia. Hyperventilation tended to occur only in those subjects who characteristically had low resting respiratory frequencies and a low ventilatory responsiveness to CO_2. Large individual differences in ventilatory response to CO_2 which were observed at rest were found to disappear during vibration. The ventilatory response to vibration had many of the characteristics of a classical Pavlovian conditional response.

A66-80591
POSTHYPERVENTILATION APNEA IN AWAKE MAN.
Cedric R. Bainton and Robert A. Mitchell (Calif., U., San Francisco Med. Center, Cardiovascular Res. Inst. and Dept. of Anesthesia, San Francisco).
Journal of Applied Physiology, vol. 21, Mar. 1966, p. 411–415. 14 refs.
Grants PHS 5-K3-HE-19,411-02, 5T 1-GM-63-07, and GM-05881.

Posthyperventilation apnea was observed in 15 of 16 healthy, awake subjects unaware of the experiment but accustomed to the experimental apparatus and environment by daily study sessions. Hyperventilation was produced by manually controlling ventilation using gas with a $P_{I_{O_2}}$ of 300–400 mm. Hg; $P_{A_{CO_2}}$ was decreased to 21 mm.Hg and maintained there for 5 min. Posthyperventilation apnea ranged from the loss of a single breath to apnea of 120 sec., and occurred after an average of 2.3 (range 1–7) daily study sessions. If $P_{A_{CO_2}}$ was kept normal during hyperventilation, there was no apnea. In three subjects who showed sustained apnea consistently,

we determined the minimal steady state level of $P_{A_{CO_2}}$ just before breathing began. This was 4–5 mm. Hg CO_2 below resting $P_{A_{CO_2}}$ and close to the apneic threshold estimated by extrapolating the linear portion of an inhaled CO_2 response curve to zero Ve. We conclude that posthyperventilation apnea can occur in awake, relaxed man; variations in observed responses remain unexplained.

A66-80592

PO_2-VENTILATION RESPONSE CURVE WITH NORMAL pH AND PCO_2 IN THE DOG.

Y. Honda and F. Kreuzer (Nijmegen, U., Dept. of Nijmegen, The Netherlands).

Journal of Applied Physiology, Vol. 21, Mar. 1966, p. 423–433. 30 refs.
Grant Natl. Heart Inst. HE-06446-01-03.

Ventilatory response to hypoxia and hyperoxia was studied in anesthetized dogs with exclusion of secondary changes of P_{CO_2} and pH. The response was referred to both alveolar and arterial P_{O_2}. The P_{O_2}-ventilation response curve in hypoxia showed a sigmoid course. The curve lay significantly above the usual normoxic level at an alveolar P_{O_2} of 90–95 mm. Hg and an arterial P_{O_2} of 75–80 mm. Hg. With increasing hypoxia it gradually rose, at an alveolar P_{O_2} of about 70 mm. Hg and an arterial P_{O_2} of some 60 mm. Hg, then it became increasingly steeper, and finally reached a maximum at a P_{O_2} of about 40 mm. Hg. The P_{O_2}-ventilation response curve in hyperoxia clearly demonstrated the chemoreceptor activity in normoxia. The threshold P_{O_2} for the chemoreflex drive seemed to lie at an alveolar P_{O_2} of 170–180 mm. Hg and an arterial P_{O_2} of 130–140 mm. Hg. The ventilatory response to normoxic drive was 30–40% of the resting level.

A66-80593

CHANGES IN ESOPHAGEAL PRESSURE TRANSMISSION DURING DETERMINATION OF LUNG COMPLIANCE.

K. P. Van de Woestijne and J. F. Naedts (U. Clin., Clin. of Internal Med., Dept. of Pneumol., Louvain, Belgium).

Journal of Applied Physiology, vol. 21, Mar. 1966, p. 441–446. 12 refs.
Fonds de la Rech. sci. med. supported research.

In the determination of the static pressure–volume curve of the lungs by means of pressure registration in the esophagus, the values of the esophageal pressure and thus the pattern of the pressure–volume curve may be influenced by the technique used to inflate or deflate the lungs. During slow stepwise deflation of the lungs of dogs, we observed an increase in the transpulmonary esophageal pressure, which was not noted in the simultaneously registered intrapleural pressure values. This increase was particularly pronounced when the deflation was preceded by a stepwise inflation or an inflation with expired air. During prolonged apnea, similar changes of the esophageal pressure were observed. They appeared to be the result of a decrease in the elasticity of the esophagus during the period of apnea. The influence of apnea on esophageal pressure and elasticity was minimized when, prior to the apnea, the dog was ventilated with oxygen. The changes in esophageal pressure observed during slow deflation and prolonged apnea are probably the result of a hypoxic phenomenon affecting the pressure transmission in the esophagus.

A66-80594

DYNAMIC CHARACTERISTICS OF VENTILATORY DEPRESSION IN MAN ON ABRUPT ADMINISTRATION OF O_2.

John J. Downes and C. T. Lambertsen (Pa. U., School of Med., Labs. of Pharmacol., Philadelphia).

Journal of Applied Physiology, vol. 21, Mar. 1966, p. 447–453. 32 refs.
Grants PHS MH-00692 and 2G-215-C4 and ONR 551(14).

The dynamic response characteristics of the oxygen sensitive peripheral chemoreflex component of the human respiratory control system were measured by determining the magnitude and time course of respiratory depression following the abrupt, sustained administration of oxygen at a fixed, elevated $P_{A_{CO_2}}$. In six subjects, inhalation of CO_2 in 16% O_2 resulted in an average control Ve of 22.6 liters/min. at a $P_{A_{CO_2}}$ of 49 mm. Hg and $P_{A_{CO_2}}$ of 104 mm. Hg. The $F_{I_{O_2}}$ was then abruptly changed from 0.16 to 0.94 while $P_{A_{CO_2}}$ was held constant by adjustment of $F_{I_{CO_2}}$. Ve, Vt, f and $P_{A_{CO_2}}$ were determined on a breath-by-breath basis. A depression of Ve induced by oxygen became evident, on the average, 2.8 sec. after the rise in $F_{I_{O_2}}$, and reached an average maximal depression of 12.3% below control Ve with an average time constant of 5.3 sec. At a higher constant $P_{A_{CO_2}}$ of 55 mm. Hg an average depression of Ve to 13.2% below the control level occurred. Values for average delay time and time constant were similar to those observed at the lower P_{CO_2}. The data indicate the contribution and time course of the oxygen sensitive component of respiratory control in resting man.

A66-80595

EFFECT OF SAMPLING TECHNIQUE ON THE DETERMINATION OF Pa_{O_2} DURING OXYGEN BREATHING.

Grant Fletcher and Jergen L. Barber (Stanford U. School of Med., Dept. of Anesthesia, Palo Alto, Calif.)

Journal of Applied Physiology, vol. 21, Mar. 1966, p. 463–468. 23 refs.
John A. Hartford Found. supported research.

Studies of the effects of sampling techniques on determination of Pa_{O_2} were carried out with arterial blood from subjects breathing oxygen and with water equilibrated with 90% oxygen. An initial loss of 23 mm. Hg P_{O_2} occurred when samples were drawn into syringes. When allowed to stand at room temperature the P_{O_2} of arterial blood samples decreased further at the rate of 5 mm. Hg per minute due to the metabolism of oxygen by blood cells. Immediate chilling of blood samples in syringes did not eliminate early losses of oxygen, but did prevent continuing losses once chilled. The mean decrease in P_{O_2} of nonchilled and chilled syringe samples was 43 mm. Hg and 74 mm. Hg, respectively. Variability of determinations of Pa_{O_2} with nonchilled syringe samples was 2.5 times and with chilled syringe samples 1.5 times greater than with direct arterial sampling.

A66-80596

RELATIONSHIP OF AIR FLOW TO PRESSURE DURING MAXIMAL RESPIRATORY EFFORT IN MAN.

Robert E. Hyatt and Raymond E. Flath (Mayo Clin. and Mayo Found., Sect. of Physiol., Rochester, Minn.).

Journal of Applied Physiology, vol. 21, Mar. 1966, p. 477–482. 10 refs.
Grant NIH GH-00146.

The relationship between esophageal pressure and rate of change of lung volume during maximal effort was studied at various degrees of thoracic inflation in four normal subjects. An inverse relationship was obtained. Relating these findings to measurements of maximal respiratory flow of air indicates that, in a given subject, inspiratory flow at all volumes and expiratory flow at near-total lung capacity are potentially limited by the muscular apparatus. Maximal expiratory flow at lesser lung inflations is much less dependent on subject effort and is limited basically by the mechanical properties of the lung.

A66-80597

SCALENE AND STERNOMASTOID MUSCLE FUNCTION.

A. Jarrell Raper, W. Taliaferro Thompson, Jr., William Shapiro, and John L. Patterson, Jr. (Va., Med. Coll., Dept. of Med., Richmond).

Journal of Applied Physiology, vol. 21, Mar. 1966, p. 497–502. 10 refs.
Grants NIH H-3361 and HTS-5573.

The present study tests and proves the hypothesis that scalene muscles contract with increasing strength during upward shift in respiratory position and delineates factors related to onset of accessory muscle activity. The scalene electromyogram obtained through needle electrodes was electrically rectified and integrated to quantify isometric muscle strength expressed as percentage of maximum. Sternomastoid electromyogram, scalene electromyogram, and integral, intraesophageal pressure, mouth pressure, lung volume (bag-in-box system with wedge spirometer), and airflow (pneumotachograph) were recorded simultaneously. In all subjects scalene strength progressively increased as actively maintained, but stationary respiratory position approached full vital capacity. Comparison of scalene strength with intraesophageal pressure during Muller maneuvers showed scattered data; however, a relationship exists. Onset of muscle activity was found related to respiratory rate, end-expiratory position, rapidity of inspiration, and volume inspired. During maximum, ventilatory efforts muscle onset preceded inspiration by up to 0.2 sec. The data delineate factors calling into play scalene and sternomastoid muscles and demonstrate a relationship between scalene force, intrathoracic pressure, and lung volume.

A66-80598

EFFECT OF DECAMETHONIUM ON HEAD LIFT, HAND GRIP, AND RESPIRATORY MUSCLE POWER IN MAN.

Mogens Jorgensen, S. Molbech, and Sophus H. Johansen (Copenhagen County Hosp., Dept. of Anaesthesia II and Cardio-Respirat. Lab.; and Danish Natl. Assoc. for Infant. Paralysis, Gentofte, Hellerup, Denmark).

**Journal of Applied Physiology, vol. 21, Mar. 1966, p. 509–512. 14 refs.
Arvid Nilsson Found. supported research.**

In human volunteers the degree of muscular depression in respiratory function, expressed as maximal inspiratory and expiratory pressures and flows, was compared to strength in head lift and hand grip following partial neuromuscular blockade with decamethonium. In all experiments the respiratory functions were consistently much less affected than head lift and hand grip. Hand grip was more affected than head lift, in contradistinction to previous results with d-tubocurarine chloride. The results demonstrate that respiration is relatively well preserved when curarization is carried to the point at which the peripheral muscle strength required for head lift and hand grip is nearly abolished.

A66-80599

NOMOGRAM BY ASTRAND AND RYHMING AS A PREDICTOR OF MAXIMUM OXYGEN INTAKE.

Pentti Teraslinna, A. H. Ismail, and D. F. MacLeod (Purdue U., Phys. Educ. Dept. and Health Center, Lafayette, Ind.)
Journal of Applied Physiology, vol. 21, Mar. 1966, p. 513–515. 9 refs.

Maximal oxygen uptake and pulse rates during submaximal work load were measured on 31 normal men engaged in sedentary occupations. Maximal oxygen uptake was measured after continual increase of the work load until the subject's heart rate "leveled off." Oxygen used by the subject during the last minute of exercise, assessed by the indirect method, corrected to STPD, and recorded in liters per minute was taken as the maximum oxygen consumption. The heart rate used for the Åstrand prediction of maximum O_2 uptake was the rate at the 4th and 5th min. if the rate had leveled off indicating a steady working state. The means and standard deviations of maximal O_2 and the corrected prediction of maximal O_2 by the Åstrand nomogram were determined. The correlation between the two values indicated that the nomogram by Åstrand and Ryhming corrected for age is a satisfactory predictor of the maximal oxygen uptake as assessed in this study.

A66-80600
PULMONARY DIFFUSION AND CAPILLARY BLOOD VOLUME IN DOGS AT REST AND WITH EXERCISE.
Richard E. Brashear, Joseph C. Ross, and Walter J. Daly (Ind. U., School of Med., Dept. of Med. and Heart Res. Center, Indianapolis).
Journal of Applied Physiology, vol. 21, Mar. 1966, p. 516–520. 17 refs.
Ind. Heart Assoc. supported research.
Grants Natl. Heart Inst. HE-04080 and HE-06228.

Much additional information about the behavior of the pulmonary capillary bed can be gained from measurements of breath-holding D_L (diffusing capacity for carbon monoxide) in animals during studies that cannot be done in human subjects. For this purpose, a modification of the breath-holding technique was devised to provide reproducible results in dogs. The technique is easy to perform, permits complete and rapid inspiration and expiration with a variable inspiratory volume, and gives readily reproducible D_L values in dogs. D_L measurements made on the same day in each dog were very reproducible and the mean D_L on one day was closely comparable to the mean D_L for the same dog on another day. As in man, D_L and V_C (capillary blood volume) increased during exercise and to a comparable degree. This study demonstrates that cortical participation is not necessary for the increase in D_L and V_C with exercise and that the increase is not prevented by anesthesia. This provides an experimental model for use in further attempts to define the factors that cause this response to exercise.

A66-80601
NERVOUS OUTPUT FROM THE RESPIRATORY CENTER DURING OBSTRUCTED BREATHING.
Ruy V. Lourenco, Neil S. Cherniack, James R. Malm, and Alfred P. Fishman (Columbia U., Coll. of Physicians and Surgeons, Depts. of Med. and Surg. and Presbyterian Hosp., Cardiorespirat. Lab., New York City, N. Y.).
(Am. Federation for Clin. Res., Natl. Meeting, Atlantic City, N. J., May 18, 1964).
Journal of Applied Physiology, vol. 21, Mar. 1966, p. 527–533. 24 refs.
Grants NIH H-2299 and HE 05741.

The present study was concerned with measuring the nervous output from the respiratory center of dogs during obstructed breathing. An assessment of this output was obtained by measuring electrical activity in the phrenic nerve before and after complete obstruction and the introduction of "threshold" loads. Indirect assessments were obtained by measuring electrical activity in the diaphragm with needles inserted in the muscle and with esophageal electrodes. The results show that, during unobstructed breathing, tidal volumes are proportional to the activity in the phrenic nerve, diaphragm, and esophagus. Conversely, during complete obstruction and during inspiratory loading, tidal volume decreases even though activity in the phrenic nerve increases. The activity recorded from diaphragm and esophagus parallels that in the phrenic nerve. These observations indicate that the minute ventilation may not measure the nervous output from the respiratory center during airway obstruction. A more reliable measure of this output may be obtained by recording electrical activity in the phrenic nerve or in the diaphragm. The activity in the diaphragm may be measured directly by needles inserted in the muscle, or indirectly by an esophageal lead introduced to the level of the diaphragm.

A66-80602
EFFECT OF APPREHENSION ON PULMONARY DIFFUSING CAPACITY IN MAN.
F. F. Cinkotai, M. L. Thomson, and A. R. Guyatt (London School of Hyg. and Trop. Med., Dept. of Occupational Health and Appl. Physiol., London, Great Britain).
Journal of Applied Physiology, vol. 21, Mar. 1966, p. 534–538. 25 refs.
Med. Res. Council supported research.

The effect of apprehension on diffusing capacity ($D_{L_{CO}}$) of the lung for carbon monoxide was investigated in 10 students, 1 hr. before and 1 hr. after the announcement of their final B.Sc. (Honours) examination results. After hearing the results the $D_{L_{CO}}$ and systolic blood pressure fell significantly by 7.7% ($P < 0.001$) and 8.2% ($P < 0.001$), respectively. The diastolic blood pressure showed no significant change and the fall in heart rate was only significant after excluding one result. It is concluded that the students were apprehensive about their performance at the examination until they heard the results, and that this caused the relative increase in $D_{L_{CO}}$ and cardiovascular indices observed. It is likely that these effects were mediated through the release of adrenaline, and possibly noradrenaline, which has been shown to increase $D_{L_{CO}}$ when administered to man by infusion.

A66-80603
DIURNAL VARIATION IN PULMONARY DIFFUSING CAPACITY FOR CARBON MONOXIDE.
F. F. Cinkotai and M. L. Thomson (London School of Hyg. and Trop. Med., Dept. of Occupational Health and Appl. Physiol., London, Great Britain).
Journal of Applied Physiology, vol. 21, Mar. 1966, p. 539–542. 21 refs.
Med. Res. Council supported research.

The pulmonary diffusing capacity for carbon monoxide ($D_{L_{CO}}$), measured in 24 normal subjects at 2-hr. intervals, fell progressively throughout the day at a rate of 1.2%/hr. between 9:30 AM and 5:30 PM, and at 2.2%/hr. between 5:30 and 9:30 PM. This fall was apparently not caused by initial apprehension, practice in the measurement technique or ambient change, nor was it associated with maintenance of the erect posture since a comparable fall (1.65%/hr.) was shown between 10:00 AM and 4:00 PM by five subjects who lay in bed and were measured in the recumbent posture. The change in $D_{L_{CO}}$ appears to be a diurnal rhythm resembling that in hematocrit and urinary catecholamine excretion.

A66-80604
TRANSCUTANEOUS DOPPLER FLOW DETECTION AS A NONDESTRUCTIVE TECHNIQUE.
R. F. Rushmer, D. W. Baker, and H. F. Stegall (Wash., U. Dept. of Physiol. and Biophys., Bioinstr. Program, Seattle).
Journal of Applied Physiology, vol. 21, Mar. 1966, p. 554–566. 40 refs.
Grant NIH HE 07293.

The human skin constitutes an important barrier to acquiring information regarding cardiovascular function on a routine basis. The techniques for detecting changes in blood are reviewed to illustrate that a limited number of the available techniques are adaptable to humans and very few are nondestructive in the sense that they involve no pain, hazard, or damage to the skin. Recent developments in electromagnetic and ultrasonic flowmeters provide a good example of the spectacular rewards obtained from flowmeters with good dynamic responses. A new ultrasonic flowmeter has been developed to continuously indicate changing blood flow velocity in superficial or deep vessels by simply applying a transducer to the skin surface over strategic sites. The applications of this transcutaneous Doppler flowmeter to both physiological and clinical investigations are critically evaluated. It can be applied to both physiological and clinical problems. To the extent that this device proves useful, it will serve as an example of the importance of developing an expanding array of nondestructive testing devices for all fields of medicine.

A66-80605
RESPONSE OF REGIONAL CIRCULATIONS TO HYPEROXIA.
Edward H. Bergofsky and Patricia Bertun (N. Y. U., School of Med., Dept. of Physiol. and Dept. of Phys. Med. and Rehabil., New York City).
Journal of Applied Physiology, vol. 21, Mar. 1966, p. 567–572. 23 refs.
Grant Vocational Rehabil. Admin. RD-1315-M.

The effects of arterial hyperoxia on regional blood flow to the brain, bowel, and hindlimb and on total blood flow were studied by measuring arteriovenous oxygen concentration differences in anesthetized dogs breathing pure oxygen. The use of arteriovenous oxygen differences for this purpose was justified by present and by past observations that hyperoxia does not affect the oxygen consumption of tissues. The present data indicate that hyperoxia decreases regional blood flow (by increasing regional vascular resistance) in varying degrees—the effect being most marked in the brain, less so in the bowel, and least obvious in the limb. As a result, the rise in venous blood O_2 saturations which would be expected during oxygen breathing are prevented wholly (brain, bowel) or in part (limb), and a relationship can be drawn between arterial hyperoxia and regional vasoconstriction which suggests a mechanism whereby tissue oxygen tensions are stabilized.

A66-80606
BLOOD, PLASMA, AND RED CELL VOLUMES: AGE, EXERCISE, AND ENVIRONMENT.
D. B. Dill, F. G. Hall, K. D. Hall, C. Dawson, and J. L. Newton (Ind. U., Dept. of Anat. and Physiol., Bloomington).
Journal of Applied Physiology, vol. 21, Mar. 1966, p. 597–602. 23 refs.
Grant PHS CD 00056-01.

Observations were made on blood components of seven men in the hot desert and on two of them at 3,800 m. 1 week after leaving the desert. Similar observations made in the desert on Dill 32 years before are recorded. No notable change occurred in blood components at rest during the first days in the desert; even in a bout of exercise there generally were no changes.

In two men who engaged in frequent strenuous exercise during a 5-week period there was a decline in total red cell volume and an increase in plasma volume with no change in blood volume. These two men, Phillips, age 34 and Dill, age 73, then made the transition to the Barcroft laboratory with a decrease in barometric pressure from 694 to 485 mm. Hg and in maximum temperature from above 40 to about 15° C. Phillips showed an increase in hemoglobin concentration and a decrease in plasma volume. Dill had a decrease in hemoglobin concentration and an increase in plasma volume. In the light of this and other evidence it appears that plasma volume in the first days at high altitude declines in youth and increases in age. From age 41 to 73, Dill's plasma volume has decreased about one-sixth and red cell volume about 6%.

A66-80607
EFFECT OF ATHLETIC TRAINING ON EXERCISE CARDIAC OUTPUT.
George M. Andrew, Carole A. Guzman, and Margaret R. Becklake (McGill U., Roy. Victoria Hosp. Cardiorespirat. Serv., Montreal, Canada).
Journal of Applied Physiology, vol. 21, Mar. 1966, p. 603–608. 28 refs.
John A. Hartford Found., Med. Res. Council, and Dept. of Natl. Health and Welfare, Canada supported research.

In four college athletes and four nonathletic freshmen, measurements were made of ventilation, O_2 consumption, cardiac output, and heart rate at three submaximal levels of exercise before, and again after, a period of athletic training. In both groups there was a decrease in heart rate, cardiac output, and minute ventilation at any given work load. Oxygen consumption was unaffected and therefore the arterial-venous O_2 difference was increased. Before training, the athletes differed from the nonathletes in having a lower minute ventilation, a larger stroke volume at the two external work loads studied, and a slower heart rate at the higher load. These differences persisted after training, when it was found also that the athletes had lower values for cardiac output at equal exercise loads.

A66-80608
CARDIAC OUTPUT IN MAN IN REST AND WORK DURING AND AFTER ACCLIMATIZATION TO 3,800 M.
K. Klausen (Ind. U., Dept. of Anat. and Physiol., Bloomington).
Journal of Applied Physiology, vol. 21, Mar. 1966, p. 609–616. 30 refs.
NASA Grant NsG 408 and Grants PHS CD 00056-02 and HE 06-308-04.

Cardiac output (Q) during rest and work was determined by a CO_2 method at an altitude of 3,800 m. The change of Q was followed on three subjects during the first 8–12 days at altitude, and in rest and two work levels in five subjects after 3–4 weeks of acclimatization. Q was increased on the first day at 3,800 m. to a maximum in two young subjects, and decreased the following days to values slightly lower than at sea level. In the old subject no change of Q was found in rest while in work a slow increase was seen the first 3 days to a plateau, which was maintained until the last day at 3,800 m. After 3–4 weeks of acclimatization it was found that Q was slightly below its sea level values both in rest and at the two work levels. The change of Q is discussed in relation to changes in other circulatory functions and in blood characteristics.

A66-80609
CUTANEOUS VASCULAR AND SWEATING RESPONSES TO TYMPANIC AND SKIN TEMPERATURES.
Robert D. Wurster, Robert D. McCook, and Walter C. Randall (Loyola U., Stritch School of Med. and Graduate School, Dept. of Physiol., Chicago, Ill.)
Journal of Applied Physiology, vol. 21, Mar. 1966, p. 617–622. 12 refs.
Grants Natl. Heart Inst. HE 08682-01 and Natl. Inst. of Health TI GM 999-01A1.

Nude subjects were placed alternately in cool and warm climate chambers. Continuous measurements were made of cutaneous bolume pulses in five areas, sweating in eight areas, tympanic membrane temperature (T_{tm}) and oral temperature (T_o). A weighted mean skin temperature (T_{ms}) was electronically computed from temperature of 12 skin areas. T_{tm} and T_{ms} were independently varied to evaluate their relative importance in control of sudomotor and vasomotor responses. (1) With T_{ms} constant at levels between 33–34° C. T_{tm} was raised as much as .3°C. without appearance of sweating. (2) With T_{tm} increased, T_{ms} was raised with full sweat recruitment. (3) With T_{ms} constant at 37° C. and T_{tm} elevated above control levels, complete sweat recruitment and large bolume pulse amplitudes were observed. Under these conditions, T_{ms} was rapidly lowered resulting in inhibition, but not cessation, of sweating and some reduction in bolume pulse amplitudes. (4) With T_{tm} maintained above control levels, sweating was fully suppressed when T_{ms} rapidly falls. These results during nonsteady states indicate that neither T_{tm} nor T_{ms} may be considered solely responsible for onset or cessation of thermolytic processes. However, both have relevance to contral nervous control of body temperature.

A66-80610
NOCTURNAL BODY TEMPERATURE REGULATION IN MAN: A RATIONALE FOR SWEATING IN SLEEP.
Edmund H. Geschickter, Patricia A. Andrews, and Robert W. Bullard (Ind. U., Med. Center, Dept. of Med. and Dept. of Anat. and Physiol., Indianapolis).
Journal of Applied Physiology, vol. 21, Mar. 1966, p. 623–630. 16 refs.
Contract AF 33(616)-8378 and Grants Clin. Res. Center FR-00057 and Natl. Heart Inst. HTS-5363.

Body temperature, rate of sweating (resistance hygrometry), and depth of sleep (EEG) were studied in eight normal subjects (men and women) age 21–24 years; 14 nights of sleep were included in 40-hr. observations at comfortable ambient temperatures. An increased foot skin temperature prior to falling asleep and an outbreak of sweating activity early in the sleeping period were consistently observed; 90% of the sweating during sleep occurred prior to reaching the diurnal low temperature. Individual variations in amount of sleep-sweating activity and duration of latency between onset of sleep and onset of sweating correlated with the rectal temperature (T_r) at the onset of sleep ($r = .93$ and $-.76$, respectively). Latency of sweating also correlated with body size as did the time lapsed between increasing foot skin temperature and the initiation of sleep ($r = -.80$ and $.90$ respectively). Reduction of T_r was associated with nocturnal sleep but not with afternoon naps though sleep-linked sweating occurred in both instances. The data are consistent with the concept that thermostatic set point lowering is relegated to the habitual sleeping hours. The diurnal low T_r is discussed as a regulated response that provides for respite from the metabolic wear entailed in higher daily temperatures.

A66-80611
PLASMA AND SWEAT HISTAMINE CONCENTRATIONS AFTER HEAT EXPOSURE AND PHYSICAL EXERCISE.
John W. Garden (U. S. Naval Med. Field Res. Lab., Camp Lejeune, N. C.)
Journal of Applied Physiology, vol. 21, Mar. 1966, p. 631–635. 14 refs.

Plasma and sweat histamine concentrations were determined in a group of healthy adult males before and after a period of daily walking on a motor-driven treadmill under hot environmental conditions. A comparison of the values before and after exercise during 10 days of repeated heat exposure was made. Plasma histamine concentrations were also determined on groups of comparable subjects before and after walking on the treadmill in a cool environment, exercises on the Universal gym (a training device designed for muscular development), and a 600-yard run. Plasma histamine concentration increased significantly during exercise in hot environmental conditions but the daily increase became significantly less after 10 days. No changes were noted in the total sweat histamine excretion during heat exposure or the plasma histamine concentrations under the other conditions of physical exercise studied. The significance of these findings to the role of histamine in cardiovascular regulation is discussed.

A66-80612
ACCLIMATIZATION TO HUMID HEAT AND THE ROLE OF PHYSICAL CONDITIONING.
N. B. Strydom, C. H. Wyndham, C. G. Williams, J. F. Morrison, G. A. G. Bredell, A. J. S. Benade, and M. von Rahden (Transvaal and Orange Free State Chamber of Mines, Human Sci. Lab., Johannesburg, South Africa).
Journal of Applied Physiology, vol. 21, Mar. 1966, p. 636–642. 16 refs.

Five mine laborers with underground experience were acclimatized to work for 5 hr. daily at a set rate under temperature conditions of 93° F.WB and 97° F.DB and wind velocity of 150 ft./min. Rectal temperatures and pulse rates decreased within the first 4–5 days, but sweat rates reached a maximum value only on the 10th day. As both the maximum work capacity and the oxygen intakes of the subjects during work changed during the acclimatization period, it was difficult to determine the relevant influences of physical training and acclimatization. Five raw recruits were, therefore, first subjected to the same conditions of heat stress, thereafter trained under cool conditions to the task for 3 weeks, and again studied in the climatic room. Training resulted in only partial acclimatization and brought the raw recruits to the same state of tolerance as that of the experienced miners on their first exposure in the climatic room. It can be concluded that although training may improve performance under conditions of heat it certainly cannot replace acclimatization.

A66-80613
AMELIORATIVE VALUE OF CARBOHYDRATE AND ELECTROLYTES IN ARCTIC SURVIVAL.
Terence A. Rogers, James A. Setliff, Alan C. Buck, John C. Klopping, and Milton Matter, Jr. (Hawaii U., Pacific Biomed. Res. Center, Honolulu).
Journal of Applied Physiology, vol. 21, Mar. 1966, p. 643–648. 11 refs.
Contracts AF 41(609)-1918 and 41(609)-2721.

Four groups of seven men each were subjected to survival conditions for 3 days in the winter arctic. One group fasted completely, the second received 150 mEq./man per day $NaHCO_3$, the third group received 500 kcal./man per day sucrose, and the fourth received both 150 mEq.$NaHCO_3$ and 500 kcal. sucrose. Sucrose supplementation diminished ketonuria and hypoglycemia. Sodium supplementation minimized dehydration, as indicated by less weight loss. Sodium and sucrose supplementation together significantly ameliorated some of the metabolic consequences of fasting in the cold. In a further experiment, three groups of six men each were subjected to a 7-day survival

situation in which one group fasted, the second group received 500 kcal. as sucrose and 150 mEq. $NaHCO_3$/man per day, and the third group 500 kcal./man per day as a pemmicanlike meat bar which is a component of current survival rations. Hypoglycemia, ketonuria, acidosis, and dehydration were similar (and severe) in both the fasting and pemmican-eating groups; these symptoms were significantly less in the sucrose-plus-electrolyte group.

A66-80614
COLD STRESS AND HABENULAR LESION EFFECTS ON RAT BEHAVIORS.
Harold C. Nielson and Anstiss H. McIver (Veterans Admin. Hosp., Sepulveda, Calif.; and Calif. U., Depts. of Anat. and Psychol., Los Angeles, Calif.).
Journal of Applied Physiology, vol. 21, Mar. 1966, p. 655–660. 30 refs.
Grants Natl. Inst. of Mental Health MH-07822 and MH-07037.

The effects of chronic cold stress, 70 hr. exposure to an environmental temperature of 2.5 to 3.0° C. acute cold stress, a 90-sec. ice-water bath, and no cold stress upon avoidance learning, blood glucose level, body weight, and protein bound iodine (PBI) were investigated in rats. Acute cold stress facilitated avoidance learning and increased blood glucose levels relative to control and chronic cold groups. Both cold-stressed groups lost weight relative to controls while PBI levels were not different for the groups. In a second experiment, the effects of acute cold stress and habenular lesions upon avoidance learning, emotionality, and exploratory behavior were investigated. Habenular lesions impaired avoidance learning and increased exploratory behavior, but did not alter emotionality. Acute cold stress reduced emotionality, facilitated avoidance learning, and decreased exploratory behavior. Acute cold stress abolished the effect of habenular lesions on exploratory behavior, reduced emotionality, and facilitated the avoidance learning of habenular rats.

A66-80615
EFFECTS OF RESERPINE ON INCREASED SENSITIVITY TO NORADRENALINE OF COLD-ADAPTED ANIMALS.
Jacques Leblanc (Laval U., School of Med., Dept. of Physiol., Quebec, Canada).
Journal of Applied Physiology, vol. 21, Mar. 1966, p. 661–664. 13 refs.
Can. Med. Res. Council supported research.

Saturation of the organism by repeated noradrenaline injections or by prolonged exposure to cold is postulated to be responsible for the increased sensitivity to noradrenaline which results from these conditions. To test this hypothesis, cold adapted rats were removed from the cold room and injected with reserpine to deplete the tissues of their noradrenaline content. Three days after a series of nine injections (5 mg./kg. daily) of reserpine or 6 days after two injections (5 mg./kg. on days 1 and 4), the increased sensitivity to noradrenaline which was still present in nonreserpinized cold-adapted rats had completely disappeared. The loss of sensitivity to noradrenaline induced by reserpine resulted in reduced tolerance to cold. These results confirm the importance of noradrenaline in cold adaptation and lend support to the hypothesis that the increased sensitivity to noradrenaline in cold adaptation is due to saturation of the organism by noradrenaline. Other mechanisms seem to be of importance in cold adaptation: the autonomic system, noradrenaline supersensitivity, and the metabolic action of noradrenaline.

A66-80616
ACCLIMATIZATION OF HEALTHY YOUNG ADULT MALES TO A HOT-WET ENVIRONMENT.
John W. Garden, I. Dodd Wilson, and P. J. Rasch (Naval Med. Field Res. Lab., Camp Lejeune, N. C.)
Journal of Applied Physiology, vol. 21, Mar. 1966, p. 665–669. 9 refs.

Thirty-eight young adult males were exercised daily for 2 weeks during the winter and early spring months on a motor-driven treadmill at 3.5 m.p.h. located in a heat chamber maintained at 98° F. dry bulb and 90° F. wet bulb. Twelve subjects walked for 50 min. followed by 10-min. rest in the heat; 13 subjects walked 50 min., rested 10 min., walked 30 more min., and rested a final 10 min.; 13 subjects walked 50 min., rested 10 min., walked 50 more min., and rested a final 10 min. A modified Balke performance test was administered before heat exposure and at the end of each week. Physiological parameters including rectal temperatures, heart rates, sweat loss and sweat electrolytes were used as measures of acclimatization. It was found that the daily exposure to heat for 2 hr. and 1-2/3 hr. produced acclimatization. Daily exposure to heat for 1 hr. resulted in significant alterations in sweat rate and sweat electrolytes but not in heart rate or body temperature. Several differences between physiologic adjustment to a hot-wet as contrasted with hot-dry climates were observed and are discussed.

A66-80617
DEHYDRATION AND MUSCULAR WORK.
F. N. Craig and E. G. Cummings (U. S. Army Edgewood Arsenal, Chem. Res. and Develop. Labs., Edgewood Arsenal, Md.)
Journal of Applied Physiology, vol. 21, Mar. 1966, p. 670–674. 13 refs.

Nine men walked to exhaustion at 3.5 m.p.h. on an inclined treadmill in a room at 46° C. dry bulb and 23° C. wet bulb, before and after 6 hrs. of sweating at rest. On days with and without restriction on water intake, respectively, the dehydration was 4.3 and 1.9% of the body weight; the walking time was reduced by 48 and 22%; and maximal oxygen intake was reduced by 27 and 10%. Subjective end points were validated by the attainment of nearly the same heart rates before and after dehydration. At comparable times in the walks there was no significant change in oxygen intake or respiratory exchange ratio associated with dehydration. Reduction in walking time was better correlated with increase in rectal temperature (0.84), decrease in fraction of carbon dioxide in expired air during work (0.82) than with dehydration (0.63). Impairment of performance was attributed to circulatory inadequacy elsewhere than in the working muscles.

A66-80618
MUSCULAR ORIGIN OF ELEVATED PLASMA POTASSIUM DURING EXERCISE.
Kate H. Kilburn (Duke U., Med. Center, Dept. of Med., Durham; and Veterans Admin. Hosp., Med. Serv., Durham, N. C.)
Journal of Applied Physiology, vol. 21, Mar. 1966, p. 675–678. 15 refs.
Grant Natl. Heart Inst. HE 07868.

In healthy subjects plasma potassium (K) concentrations increased from resting levels of 3.8 mEq./liter to 5 mEq./liter during treadmill walking with average O_2 consumptions of 2 liters/min. Whole blood K levels increased similarly as arterial blood hydrogen (H) ion concentration increased 5.9 moles/liter and bicarbonate levels decreased 1.6 mEq/liter. Similar changes occurred in ambulatory patients walking to produce O_2 consumptions of 1,200 ml./min. Plasma draining from the exercising forearms of similar subjects contained 0.7 mEq./liter more K than did arterial plasma. Whole blood K concentration CO_2 tension, H ion and bicarbonate levels were elevated in such venous blood but arterial blood levels were unchanged. It is postulated that exercise produced acidosis in muscle cells, that some K was exchanged for H ions, and both were released from striated muscle. This is most consistent with the increased H ion concentration of arterial blood during moderate systemic exercise and in blood draining from the exercising forearm. However, in view of the small fraction of change in muscle K required to produce a large increase in extracellular K, other mechanisms may explain the liberation of K into venous blood during exercise.

A66-80619
HEAT AND AGING EFFECTS ON THYROID FUNCTION OF MALE RATS.
H. D. Johnson, M. W. Ward, and H. H. Kibler (Mo. U., Dept. of Dairy Husbandry, Columbia).
Journal of Applied Physiology, vol. 21, Mar. 1966, p. 689–694. 14 refs.
Grant Div. of Environ. Eng. and Food Protection Res. EF-00227.

One hundred male rats were separated into three groups at 21 days of age: group A was reared at 28° C. (thermoneutral zone) and fed ad libitum; group B was reared at 34° C. and fed ad libitum; and group C was reared at 28° C. and control fed (amount consumed by group B). Thyroid I^{131}-release rates were measured monthly beginning at 34 days of age up to 187 days, then on alternate months throughout their lives. Thyroid I^{131}-release rate constants tended to be depressed at the elevated temperature (34° C.) up to 40 days, but thereafter increased to a level significantly higher than in group A or C. This higher thyroidal I^{131}-release rate of heat-exposed animals persisted throughout their lifetime. Thyroid sections examined histologically suggested hyperactive glands in older animals reared at 34° C., whereas the two groups reared at 28° C. demonstrated characteristics associated with normal thyroid glands. Oxygen consumption (milliliters per hour per gram of body weight) of these groups was not significantly different throughout their lifetime except at the younger age of 42 days. At this age, the values for the animals at 34° C. were significantly lower than those for the 28° C. control-fed and ad libitum-fed groups.

A66-80620
A TRANSCUTANEOUS ULTRASONIC BLOOD-VELOCITY METER.
H. F. Stegall, R. F. Rushmer, and D. W. Baker (Wash. U., School of Med., Dept. of Physiol. and Biophys., Seattle).
Journal of Applied Physiology, vol. 21, Mar. 1966, p. 707–711. 12 refs.
Grant NIH HE-0793.

An ultrasonic flowmeter was developed for continuously indicating instantaneous arterial or venous blood flow velocity in vessels under intact skin or even deep within the body. This flowmeter is based on the Doppler principle that continuous wave ultrasonic energy backscattered from moving blood is altered in frequency. The difference in frequency between transmitted sound and sound backscattered from blood is within the audible range. Mean frequency of the sound spectrum appears to be directly related to mean flow velocity. This signal may also be analyzed by differentiation to inscribe on a standard strip chart recorder the change of blood velocity with time. If the angles between ultrasonic beams and the vascular channel are known, it is possible to record blood flow velocity. In its current form, this flowmeter does not distinguish forward from backward flow. Its particular utility lies in its easy detection of relative blood flow in vessels beneath the skin in human subjects without pain or injury.

A66-80621
IMPLANTED ELECTRODES FOR ELECTRONYSTAGMOGRAPHY IN THE SQUIRREL MONKEY.

R. A. Cutt, E. W. Keels, M. Litvin, and R. J. Wolfson (Presbyterian Hosp., Otol. Res. Lab., Philadelphia, Pa.)
Journal of Applied Physiology, vol. 21, Mar. 1966, p. 715–717.
Grant Natl. Inst. of Neurol. Diseases and Blindness NB-04627.

The authors describe an electrode assembly and operative procedure for implanting electrodes in the lateral orbital wall of the squirrel monkey for purposes of recording nystagmus. A comparison of electronystagmograph tracings recorded with implanted and subdermal electrodes reveals that the implanted electrodes reduce artifacts introduced by muscle potentials, increase the amplitude of the recorded response by more than 10 db., and are convenient for long-term experimentation.

A66-80622
MEASUREMENT OF BLOOD PO_2 WITH THE MICROCATHODE ELECTRODE.
Francis Moran, Louis J. Kettel, and David W. Cugell (Northwestern U., Med. School, Dept. of Med.; and Veterans Admin. Res. Hosp., Chicago, Ill.)
Journal of Applied Physiology, vol. 21, Mar. 1966, p. 725–728. 19 refs.
Grants PHS A 1-03714, HE 04629 and 5K 3 HE2203.

Two forms of the microcathode oxygen tension (P_{O_2}) electrode exhibit a hysteresis effect which is probably a source of discrepancy in previously reported results. Blood P_{O_2} was measured, avoiding hysteresis, by exposing the electrode to nitrogen both before the calibrating gas and the blood sample so that all readings were made from the same zero-output base line. Calibration was performed by equilibration of blood samples with gases of known P_{O_2}. Significant differences in P_{O_2} readings due to membrane material were demonstrated. The indicated P_{O_2} of blood is near the gas P_{O_2} in the physiological range when polypropylene membrane is used on either electrode, but this is not true of Teflon. Indicated blood P_{O_2} is 10–24% lower than gas P_{O_2} in the higher ranges. Standard error of estimate of samples in the range 0–105 mm. Hg was 2.5 mm. Hg using polypropylene membrane on one of the electrodes. With blood samples of identical P_{O_2}, polypropylene gives a smaller error of measurement than Teflon.

A66-80623
SOURCES OF ERROR IN OXYGEN TENSION MEASUREMENT.
P. Gregg Rhodes and Kenneth M. Moser (Georgetown U., Med. Center, Dept. of Med., Pulmonary Sect.; Georgetown Clin. Res. Inst., Pulmonary Sect.; and FAA, Office of Aviation Med., Washington, D. C.)
Journal of Applied Physiology, vol. 21, Mar. 1966, p. 729–734. 15 refs.

Several potential sources of error were explored in measurement of blood oxygen tension (P_{BO_2}) by a polarographic system incorporating a microelectrode. Values of tonometered blood and tonometer gas were compared when the electrode was covered first by a polyethylene, then by a polypropylene membrane. It was found that P_{BO_2} was consistently below gas oxygen tension (P_{GO_2}). The P_{GO_2}/P_{BO_2} relationship with polyethylene was nonlinear over the 10–700 mm. Hg range and characterized by the equation $P_{GO_2} = (1.24 \times P_{BO_2})$ below 62.5 mm. Hg. and the equation $P_{GO_2} = (1.08 \times P_{BO_2}) + 10$ above 62.5 mm. Hg. With the polypropylene membrane, the P_{GO_2}/P_{BO_2} relationship was linear and such that $P_{GO_2} = 1.05 \times P_{BO_2}$. The reasons for these P_{GO_2}/P_{BO_2} differentials are discussed. The pH and hematocrit of blood were found to have no effect on measured blood oxygen tension, nor did the presence of heparin in samples. Premeasurement handling of blood samples was also explored. It was found that maintenance of samples at 25° C. and 37° C. was accompanied by significant declines in P_{BO_2}, while P_{BO_2} was stable in samples held at 0° C. Introduction of samples in the system at 0° C. was not found to introduce a measurement error.

A66-80624
A TRANSDUCER FOR RECORDING THE INSTANTANEOUS RESPIRATORY WAVEFORMS IN ANIMALS AND MAN.
Robert J. Adolph and Joseph C. Frommer (Cincinnati U., Coll. of Med., Cincinnati Gen. Hosp., Dept. of Internal Med., Cardiac Res. Lab., Ohio).
Journal of Applied Physiology, vol. 21, Mar. 1966, p. 737–740. 9 refs.
Grant PHS HE-06307.

A simple, inexpensive transducer is described for use in animal experiments or for patient monitoring in which the exact timing of respiratory events is desired. The sensing element is a very fine tungsten wire with negligible thermal time delay. For experiments in which right heart events, e.g., pressure, flow, and heart sounds, are to be correlated with respiratory events and the exact timing of the beginning and end of inspiration and expiration is desired, the tungsten wire transducer would seem superior to other available techniques.

A66-80625
EXPOSURE SYSTEM FOR SMALL ANIMALS AT ATMOSPHERIC AND REDUCED PRESSURES.
P. D. Quattrone and R. W. Staley (NASA, Ames Res. Center, Biotechnol. Div., Moffett Field, Calif.)
Journal of Applied Physiology, vol. 21, Mar. 1966, p. 741–744.

An exposure system is described which provides for chronic exposure of experimental animals (rats) to selected gaseous environments of varied composition and pressure (150–760 mm. Hg absolute). The system includes specially designed exposure capsules, a gas flow system, and automatic pressure-regulation system, and a respiratory gas analyzer for operation at both atmospheric and reduced pressures. The system has been operated at reduced pressure (450 mm. Hg absolute) for a period of 64 days with no apparent operational problems and has provided ± 5 mm. Hg pressure control. Air control animals at atmospheric pressure over this period demonstrated that: (1) the capsule environment did not restrict the animals; and (2) growth rates and food consumption data did not differ appreciably from that for animals in metabolic cages.

A66-80626
CONVERSION OF ACETYL STROPHANTHIDIN-INDUCED VENTRICULAR TACHYCARDIA TO SINUS RHYTHM BY ETHYL ALCOHOL.
R. R. Paradise and V. Stoelting (Ind. U. School of Med., Depts. of Pharmacol. and Anesthesiol., Indianapolis).
Archives Internationales de Pharmacodynamie et de Thérapie, vol. 157, Oct. 1965, p. 312–321. 18 refs.
Grants PHS FR-5071 and H-6308.

In order to determine interrelationships between ethyl alcohol and other drugs, the digitalis preparation acetyl strophanthidin was simultaneously administered with the alcohol. Acetyl strophanthidin was infused intravenously into ten dogs at a constant rate of 6 μg./kg./min. After the establishment of ventricular tachycardia, ethyl alcohol was administered intravenously at dose levels ranging from 200–2000 mg./kg. All dogs receiving 750 mg./kg. or more and one of two dogs receiving 500 mg./kg. were immediately converted to sinus rhythm of varying duration (0.3 to 10 min.). The duration of conversion appeared to be dependent on the dose of alcohol administered. The threshold level of blood alcohol needed for conversion to sinus rhythm (i.e., suppression of the ventricular pacemaker) was determined to be about 240 mg. percent. Similarities and differences between the effects of ethyl alcohol and other anti-arrhythmic drugs are pointed out and a possible mechanism of action is proposed.

A66-80627
ELECTROCARDIOCORDER-AVSEP PATTERNS IN 37 NORMAL ADULT MEN: A FOUR YEAR EXPERIENCE.
John S. Gilson (Western Found. for Clin. Res., Great Falls Clin; and Mont. Deaconess Hosp., Great Falls, Mont.)
American Journal of Cardiology, vol. 16, Dec. 1965, p. 789–793. 7 refs.
Mont. Heart Assoc. supported research.
Grant Natl. Heart Inst. HE-08347(CV).

Yearly, five-hour electrocardiographic records were taken in each of four successive years on 37 business men, using the Holter Research Laboratory devices for continuous recording and rapid playback, the Electrocardiocorder-AVSEP system. Variations of T waves (and to some extent, the S-T segment) were frequent and often marked; T waves became flat or inverted in some subjects (7 out of 37, or 19%) year after year. Although these changes may have reflected change of body position or other changes such as straining, emotion, and digestion, they were not associated with clinical heart disease over the four-year period of observation. Those patterns which remained relatively unchanged throughout any five hours were almost always predictive of very similar patterns in the subsequent year's record. Most subjects (about 75%) showed both a basic (predominant) pattern, characteristic of the individual, as well as characteristic variations from that pattern; these characteristics changed little in successive yearly records. The QRS segment remained relatively constant (except for change in S wave amplitude) in these erect subjects. Ventricular ectopic beats occurred very rarely except in two subjects. Five subjects showed heart rates consistently about 100/min. without regard to periods of greater or lesser physical activity in each of the four yearly records. This study further defines the range of variability in the patterns seen with the Electrocardiocorder-AVSEP system.

A66-80628
SPACE MEDICINE.
Philip G. Keil (AF Systems Command, Andrews AFB, Washington, D. C.)
(Iowa Med. Soc., Ann. Meeting, Apr. 12, 1965).
Journal of Iowa Medical Society, vol. 56, Jan. 1966, p. 21–24. 9 refs.

The author surveys the development of space medicine. These topics are discussed: (1) the artificially created state of weightlessness; (2) the effect of space flight conditions on body organs and physiology; (3) the impact of space missions on technological development; (4) the development of the air program in the last 35 years.

A66-80629
ELECTROMETRIC SURFACE PH OF THE ISCHEMIC KIDNEY AND THE EFFECT OF HYPOTHERMIA.
Jan R. Dmochowski and Nathan P. Couch (Harvard Med. School, Dept. of Surg., and Peter Bent Brigham Hosp., Boston, Mass.)
Journal of Surgical Research, vol. 6, Jan. 1966, p. 45–48. 7 refs.
AEC supported research.

The mean surface pH of intact normothermic rabbit kidneys was 7.45 and of intact normothermic dog kidneys, 7.40. The pH of ischemic kidneys decreased very sharply after renal vascular pedicle clamping, and after 2 hours of ischemia the mean surface pH was 6.67 in the rabbit and 6.52 in the dog. Hypothermia markedly lessened the decrease of pH in ischemic kidneys. After resumption of arterial blood flow in kidneys which were ischemic for 2 hours, the surface pH returned to normal levels within 5 minutes. If the position of the pH electrode was changed in intact normothermic kidneys, or in kidneys that had been ischemic for 24 hours, there was no change in the reading. However, if the electrode position was shifted in kidneys that had been ischemic for 2 hours or less, the reading shifted rapidly to the control value, and then rapidly returned to the reading at the previous site. It is speculated that this phenomenon, as yet unexplained, may relate to the process of tissue death. Possible new directions for these investigations are cited.

A66-80630
THE EFFECT OF PROLONGED COLD AND STARVATION AND SUBSEQUENT REFEEDING ON PLASMA LIPIDS AND GLUCOSE OF NORMAL MEN.
Milton Mager and P. F. Iampietro (U. S. Army Natick Labs., Natick, Mass.)
Metabolism, vol. 15, Jan. 1966, p. 9–16. 22 refs.

Six healthy young men served as test subjects in a 6-week study which consisted of a 2-week control period, a 2-week starvation-plus-cold period, and a 2-week period of refeeding with restricted diets. Plasma glucose levels declined to 20% below control values within 2 days of cold and starvation. Restoration to control levels was achieved during the first day of refeeding. Plasma cholesterol, phospholipids and total lipids increased during the early phases of cold and starvation, and were restored to control values by the end of the fourteenth day. Plasma-free fatty acids (FFA) rose to over 200% of control levels within 2 days, and remained constant. With refeeding, plasma cholesterol, phospholipids, and total lipids "overshot" to levels of 20–40% of control values; whereas, FFA declined to lowest levels which averaged 32% below control concentrations. The reciprocal changes in FFA and other lipids suggest that in man, as in experimental animals, exuberant lipogenesis may occur when refeeding is instituted following depletion of endogenous substrates.

A66-80631
DEFECT OF URINARY ACIDIFICATION DURING FASTING.
Francis X. Schloeder and Bobby J. Stinebaugh (Gorgas Hosp., Dept. of Internal Med., Canal Zone).
Metabolism, vol. 15, Jan. 1966, p. 17–25. 22 refs.

The capacity of the kidney to secret hydrogen ions against a gradient was evaluated during fasting. Six healthy obese individuals were subjected to the short ammonium chloride loading test before and after 8 days of fasting. Fasting was continued for an additional 5 days, during which each subject was given 300 mEq. of potassium chloride. After the potassium replacement, a third ammonium chloride loading test was performed. The results demonstrated that after 8 days of fasting the renal capacity to depress the urine pH after ammonium chloride loading was completely lost, but that this impairment was reversed by the administration of potassium chloride.

A66-80632
INFLUENCE OF POSTURE AND DIURNAL RHYTHM ON THE RENAL EXCRETION OF ACID: OBSERVATIONS IN NORMAL AND ADRENALECTOMIZED SUBJECTS.
Philip R. Steinmetz and Robert P. Eisinger (N. Y. U., School of Med., Dept. of Med.; and Bellevue Hosp., N. Y. U. Divs., New York).
(Am. Physiol. Soc., Ann. Meeting, Chicago, Ill., Apr. 15, 1964).
Metabolism, vol. 15, Jan. 1966, p. 76–87. 21 refs.
Grants PHS H-3272 and FR-96.

The influence of posture and diurnal rhythm on the renal excretion of acid was examined in 4 normal and 2 adrenalectomized subjects. Assumption of the recumbent position in normal subjects resulted in inhibition of acid excretion, the extent of inhibition being influenced by the diurnal rhythm. Postural inhibition of acid excretion was also observed at high levels of acid excretion following methionine loading. In adrenalectomized subjects assumption of the recumbent position resulted in postural natriuresis but not in any decrease in acid excretion. The postural inhibition of acid excretion occurring in normal subjects could not be restored in adrenalectomized subjects by administration of hydrocortisone, methylprednisolone, or aldosterone. It is suggested that; (1) postural inhibition of acid excretion is dependent on adrenal function but not directly on the presence of glucocorticoid hormone or aldosterone; (2) the mechanism of postural and diurnal variations in acid excretion may share a common factor.

A66-80633
THE SEAT BELT SYNDROME—DOES IT EXIST?
Jay Fish (Tex. U., Med. Branch, Dept. of Surg., Galveston) and Robert H. Wright (Brooke Gen. Hosp., Dept. of Urol., Fort Sam Houston, Tex.).
Journal of Trauma, vol. 5, Nov. 1965, p. 746–760. 11 refs.

Four cases of intra-abdominal injury in an aircraft accident are described. In these four cases, there exists the distinct possibility that the injuries resulted from the restraining action of the seat belt. The pattern of injury included lower abdominal wall and flank contusions, rupture of the distal small intestine and tears of the mesentery. Two of the cases presented acute clinical shock resulting from bleeding from the lacerated mesentery. The other two cases had abdominal pain which failed to resolve and developed out of proportion to the abdominal wall injury. The latter two cases had ruptures of the ileum. The fact that seat belts may be responsible for a few injuries should not detract from the greater role seat belts play in reducing the overall number and severity of injuries. A history of the circumstances of the accident, together with the presence of lower abdominal wall contusions, should alert the examiner to the possibility of lower torso injury.

A66-80634
"JUMPERS SYNDROME": THE TRAUMA OF HIGH FREE FALL AS SEEN AT HARLEM HOSPITAL.
William S. Lewis, Arthur B. Lee, Jr., and S. Ashby Granthan (Harlem Hosp. Center, Orthopaed. Serv.; and Columbia U., Coll. of Physicians and Surgeons, Dept. of Orthopaed. Surg., New York, N. Y.).
(Am. Assoc. for Surg. of Trauma, 25th Ann. Session, Philadelphia, Pa., Oct. 14–16, 1965).
Journal of Trauma, vol. 5, Nov. 1965, p. 812–818. 9 refs.

Fifty-three patients presented with the consequences of high free fall at Harlem Hospital in the past year. The physical forces, psychiatric background, and medical findings influencing survival and treatment have been considered. This type of trauma is considerably more common and the human tolerances are far greater than we initially assumed.

A66-80635
EFFECTS OF NOREPINEPHRINE AND ANGIOTENSIN II-AMIDE ON CORONARY FLOW AND MYOCARDIAL OXYGEN CONSUMPTION IN THE CAT.
M. Meier, E. Wirz, H. Brummer, and W. Stamm (Ciba Ltd., Pharm. Dept., Res. Labs., Basle, Switzerland).
Cardiologia, v. 47, 1965, p. 127–138. 20 refs.

In cats with open chest and a right heart bypass the effects of equipressor infusions of norepinephrine and angiotensin (hypertensin) on total coronary flow and myocardial oxygen consumption were measured. Cardiac output and heart rate were kept constant. If the pressure increase during norepinephrine infusion was eliminated by opening a shunt, coronary flow and oxygen consumption remained elevated by 47% and 40%, respectively, compared with pre-infusion values. During angiotensin infusion under these conditions coronary flow was reduced by 5% and oxygen consumption was unchanged as compared with pre-infusion values. It is concluded that the enhanced coronary flow under norepinephrine is caused by an increased oxygen requirement.

A66-80636
A STUDY OF HUMAN CONTROL IN A STOCHASTIC MULTISTAGE DECISION TASK.
Amnon Rapoport (N. C. U., Chapel Hill).
Behavioral Science, vol. 11, Jan. 1966, p. 18–32. 11 refs.
Grants NIH M-4238-05 and AFOSR-85-63.

Models of decision making can be grouped into two general classes: static and dynamic decision making. The first consists of those tasks where a single decision is made, the subject is told of the results of his decision, and no further application is made. In dynamic decision making, subsequent decisions depend in part on past experience in the task and thus learning is involved in the act. The latter sort of decisions can be further broken down into two types: those that do not affect the environment in which the decision maker is behaving, and those involving the future environment. A decision maker who can actively manipulate the environment by his decisions is conceived of as a controller. This article considers a dynamic programming model for this type of decision-making task.

A66-80637
TOWARD A THEORY OF GROUP-DECISION BEHAVIOR.
Geoffrey P. E. Clarkson and Francis D. Tuggle (Mass. Inst. of Technol. and Cargenie Inst. of Technol., Boston).
Behavioral Science, vol. 11, Jan. 1966, p. 33–42. 12 refs.
NASA supported research.

Reported here is experimental work on dyadic groups testing the theory that a group's decision behavior is produced by the decision procedures of individuals plus a conflict-resolving process. The theory is being extended to triadic groups.

A66-80638
AUTOMATIC DATA PROCESSING IN PSYCHOPHYSIOLOGY: A SYSTEM IN OPERATION.
Bernard Tursky, David Shapiro, and P. Herbert Leiderman (Mass. Mental Health Center, Harvard Med. School, Boston).
Behavioral Science, vol. 11, Jan. 1966, p. 64–70. 5 refs.
Grants NIMH MH05077-03, MH04172, MH08853-01 and K3-MH-20,476-01 and NSF-GP-683 and Contract Nonr-1866(43).

Methodology is described for a sophisticated data processing system specifically geared to the requirements of psychophysiology laboratories. It is relatively simple and utilizes readily available equipment. The basic approach is to record physiological data in analog form on magnetic tape, and to convert it into digital form in a format compatible with high speed digital computers. The system was designed to be used in conjunction with data-processing facilities of a computation center rather than with a small digital computer.

A66-80639
THE INFLUENCE OF LOW ENVIRONMENTAL TEMPERATURE ON CELLULAR BLOOD ELEMENTS AND WEIGHT GAIN IN RABBITS [WPLYW NISKIEJ TEMPERATURY SRODOWISKA NA ELEMENTY KOMORKOWE KRWI I PRZYROSTY WAGOWE U KROLIKOW].
Zygmunt Szkutnik.
Polskie Archiwum Weterynaryjne, vol. 9, 1965, p. 109–118. 17 refs. In Polish.

The author studied the influence of rapid fall of environmental temperature in summer on blood morphology in rabbits, without changing the food and preserving stable humidity and air movement. He investigated the reaction of the organism in relation to food intake and the general conditions of the animals. During a 15-day-long exposure of the animals to a temperature of –90° C. there occurred a statistically significant increase of body temperature, on the average of 0.4° C., from the fifth experimental day. An increase in body weight of about 0.40 kg. (17.8% in relation to the initial weight) by increased food consumption was observed. Low environmental temperature during the summer caused a statistically significant decrease of erythrocyte count and hemoglobin content without lowering the color index, and an increase of lymphocytes with a simultaneous decrease of neutrophiles.

A66-80640
THE RELATIVE EFFECTS OF HYPOXIA AND HYPERCARBIA ON ADRENAL MEDULLARY SECRETION IN ANESTHETIZED DOGS.
Timothy S. Harrison and John Seaton (Mich. U., Med. School, Ann Arbor).
Journal of Surgical Research, vol. 5, Dec. 1965, p. 560–564. 15 refs.
Grant NIH AM 07252.

In anesthetized dogs profound hypoxia produced by the sustained spontaneous inhalation of 10% oxygen in 90% nitrogen resulted in an increase in adrenal medullary secretion rate of adrenaline and noradrenaline. There was no associated increase in the arterial plasma concentrations of these amines. On the other hand, hypercarbia produced by spontaneously breathing 30% CO_2 in otherwise identical circumstances elicited a massive secretion of adrenaline and noradrenaline from the adrenal medulla. This resulted in marked elevations of the arterial plasma levels of these amines. This effect of hypercarbia could be totally overcome by mechanical ventilation or by maintaining a constantly normal arterial pH with the use of an efficient buffer.

A66-80641
INTERPERSONAL EXCHANGE IN ISOLATION.
Irwin Altman and William W. Haythorn (Naval Med. Res. Inst., Bethesda, Md.)
Sociometry, vol. 28, Dec. 1965, p. 411–426. 27 refs.

This study explored interpersonal exchange in isolated and non-isolated groups. Nine dyads formed at different levels on need achievement, need dominance, need affiliation and dogmatism worked and lived in a small room for ten days, with no outside contact. Matched controls followed a similar schedule but had access to other people and outside facilities. Results on a self-disclosure questionnaire showed several differences. Isolates revealed more about intimate topics to partner than controls, although less than to best friend. Controls revealed in intimate areas comparable to disclosure to average persons. Isolates also achieved a depth of disclosure similar to that achieved with close friends, although the magnitude of such disclosure was small. Results were integrated into a general theoretical model describing the development of relationships and exchange of personal information.

A66-80642
THE EFFECT OF OXYGEN ON IMMATURE RETINAL VESSELS.
Arnall Patz (Johns Hopkins U., Wilmer Inst., Filbert Res. Lab., and Sinai Hosp., Dept. of Surg., Div. of Ophthalmol., Baltimore, Md.)
Investigative Ophthalmology, vol. 4, Dec. 1965, p. 988–999. 23 refs.
Grant NIH NB-02198-06.

Nursery observations and animal experimentation have clearly demonstrated a specific toxic effect of oxygen on the immature retinal vessels. In animals having an existing hyaloid structure at birth, oxygen exposure causes an abnormal persistence and apparent proliferation of these vessels. The unique susceptibility of the retinal vessels to oxygen is limited to the retina with an incomplete vasculature; the fully vascularized retina is resistant to oxygen damage. Light and electron microscopic observations on the effects of hyperoxia on immature vessels are discussed.

A66-80643
THE ROLE OF THE SYMPATHETIC NERVOUS SYSTEM IN THE CIRCULATORY RESPONSE OF THE RABBIT TO ARTERIAL HYPOXIA.
J. P. Chalmers, J. P. Isbister, P. I. Korner, and H. Y. I. Mok (New South Wales U., School of Physiol., Sydney, Australia).
Journal of Physiology, vol. 181, Nov. 1965, p. 175–191. 38 refs.
Life Insurance Med. Res. Fund, Australia and New Zealand and Natl. Heart Found. of Australia supported research.

The role of the sympathetic nervous system in the circulatory response to moderate and severe hypoxia was examined in the unanesthetized rabbit. Severe arterial hypoxia produced a reflex increase in sympathetic activity as estimated from a decreased circulatory response to the ganglion-blocking drug trimetaphan camphorsulphonate. Selective block with either alpha-adrenergic (phenoxybenzamine) or beta-adrenergic (propranalol) blocking drugs unmasked the effects of the unblocked pathways during severe hypoxia (P_{O_2} 25–30 mm. Hg). A balanced activation of both systems helped to maintain the cardiac output close to initial control values in hypoxia of this degree. The reflex increase in sympathetic activity could be abolished by section of the carotid and aortic nerves, and was probably due to stimulation of the arterial chemoreceptors. The 'high cardiac output' response observed in moderate arterial hypoxia appears to result largely from the local dilator effects of hypoxia, and the slight increase in alpha- and beta-adrenergic activity contributes to the maintenance of the arterial pressure.

A66-80644
EXPERIMENTAL OBSERVATIONS ON OHP: THERAPEUTICAL USES OF OXYGEN AT HIGH PRESSURE AND PREVENTION OF ITS TOXICITY.
E. Ciocatto (Turin U., Inst. of Anaesthesiol. and Resuscitation, Italy), L. Bellelli, G. Moricca (Cancer Inst. "Regina Elena", Dept. of Anaesthesiol., Rome, Italy), R. Cavaliere and A. Alfano (Ital. Navy Health School, Livorno, Italy).
(Assoc. of European Anaesthesiol., VI Intern. Congr., Athens, Sep. 9–13, 1965).
Panminerva Medica, vol. 7, Nov. 1965, p. 424–427. 17 refs.

Following previous work on the problem of oxygen at high pressure (OHP), some specific therapeutical applications of OHP are discussed. It is shown that good results are obtained in experimental animals intoxicated with carbon monoxide or cyanide and treated by OHP at 2.5 or 3 atmospheres. Oxygen toxicity is discussed and mention is made of the various therapeutical possibilities that have been proposed. The administration of an antioxidant, vitamin E, at a certain time before exposure to OHP is shown to be useful in preventing OHP toxicity. In fact, all animals treated with vitamin E survived and were in very good condition after three hours of OHP at 3 atmospheres when the vitamin E was injected 48 hours before introduction into the hyperbaric chamber.

A66-80645
ENZYME SUBSTRATE REACTIONS IN HIGH MAGNETIC FIELDS.
J. E. Maling, M. Weissbluth, and E. E. Jacobs (Stanford U., Biophys. Lab., Calif.).
Biophysical Journal, vol. 5, Nov. 1965, p. 767–776. 11 refs.
Grant Am. Cancer Soc. IN 32E-16.

The reaction rates of two enzyme substrate systems, ribonuclease-RNA and succinate-cytochrome c reductase, were followed as a function of magnetic field from zero to 48,000 gauss. The reaction rates remained constant to within 10 percent.

A66-80646
MOSSBAUER EFFECT IN HEMOGLOBIN AND SOME IRON-CONTAINING BIOLOGICAL COMPOUNDS.
U. Gonser and R. W. Grant (North Am. Aviation Sci. Center, Thousand Oaks, Calif.)
Biophysical Journal, vol. 5, Nov. 1965, p. 823–844. 44 refs.

The Mossbauer effect (recoil-free nuclear γ-ray resonance) in Fe^{57} was used to study the molecules, hemoglobin, O_2-hemoglobin, CO_2-hemoglobin, and CO-hemoglobin (within red cells) and the molecules, hemin and hematin (in the crystalline state). Quadrupole splittings and isomeric shifts observed in the Mossbauer spectra of these molecules are tabulated. The temperature dependence of the quadrupole splitting and relative recoil-free fraction for hemoglobin with different ligands was investigated. An estimate of the Debye–Waller factor in O_2-hemoglobin at 5° K. is 0.83. An asymmetry in the quadrupole splitting observed in hemoglobin is attributed to a directional dependence of the recoil-free fraction which establishes the sign of the electric field gradient in the molecule and indicates that the lowest lying d orbital of the Fe atoms is $|xy>$. This asymmetry indicates that the iron atoms in hemoglobin are vibrating farther perpendicular to the heme planes than parallel to them, and, in fact, the ratio of the mean square displacements perpendicular and parallel to the heme planes in hemoglobin is ~5.5 at 5° K. The temperature dependence of the quadrupole splitting in hemoglobin was used to estimate a splitting between the lowest lying iron atom d orbitals of ~420 cm^{-1}.

A66-80647
A BIOMAGNETIC HYPOTHESIS.
Richard L. Liboff (Cornell U., School of Elec. Eng., Ithaca, N. Y.)
Biophysical Journal, vol. 5, Nov. 1965, p. 845–853. 21 refs.
Contract AEC AT(30-1)1480.

A hypothesis is suggested to explain the inhibiting effect which magnetic fields have on the growth rate of cells. The mechanism is based on the influence a magnetic field has on the diffusion of charged particles. Electric fields originating within the cell are used to simulate an active transport mechanism. Estimates indicate that the dynamics of cells with charged cytoplasm are significantly perturbed by magnetic fields of the order of 10^5 gauss.

A66-80648
DIGITAL COMPUTER SIMULATION OF RESPIRATORY RESPONSE TO CEREBROSPINAL FLUID P_{CO_2} IN THE CAT.
J. D. Horgan and R. L. Lange (Marquette U., Dept. of Elec. Eng. and Dept. of Med., Milwaukee, Wis.)
Biophysical Journal, vol. 5, Nov. 1965, p. 935–945. 18 refs.
Grants PHS 5 R01 08456 and HE-07434.

The respiratory control system is treated as linear with a transmission delay between ventilation and sensing points (chemoreceptors). To the accepted variables involving body gas stores, ventilatory effects, transmission effects, steady state pH, carbon dioxide tension, and oxygen tension chemoreceptor response, a certain detailed analysis of the central receptors is added. By construction of a model for medullary CO_2 receptor utilizing expected values of CNS (central nervous system) circulation, CO_2 production, and tissue-buffering effects, results of experimental observation of the effects of alteration of cerebrospinal fluid (CSF) were simulated. The inclusion of CSF effects also allowed simulation of the response to alteration in inspired CO_2, hyperventilation, and the periodic breathing with; prolongation of circulation time.

A66-80649
THE RESISTANCE OF THE MYOCARDIUM TO ANOXIA IN ANIMALS ACCLIMATED SIC] TO SIMULATED ALTITUDE.
O. Poupa, K. Krofta, J. Prochazka, and M. Chvapil (Czechoslovak Acad. of Sci., Inst. of Physiol., and Inst. of Hyg. and Occupational Diseases, Prague).
Physiologia Bohemoslovenica, vol. 14, 1965, p. 233–237. 7 refs.

During the first 6 weeks of acclimation to a simulated altitude of 7000 m. the myocardium of rats was changed in such a way that the right ventricles became more resistant to acute anoxia in vitro. This was shown by a greater ability to recover from oxygen lack particularly at higher frequencies of stimulation (60/min., 20 min. in nitrogen). This change was the same as seen in rats made anemic by iron deficiency. During long-term acclimation to 5000 m. (44 weeks), the hypertrophic right ventricle showed visible fibrotic changes. In other parts of the heart these changes were demonstrated only chemically.

A66-80650
THE EFFECT OF THE DURATION OF ANOXIA, THE FREQUENCY OF STIMULATION AND TEMPERATURE ON THE CONTRACTILITY OF THE RAT MYOCARDIUM INJURED BY ANOXIA.
K. Krofta, J. Prochazka, and O. Poupa (Czechoslovak Acad. of Sci., Inst. of Physiol., Prague).
Physiologia Bohemoslovenica, vol. 14, 1965, p. 238–240. 6 refs.

Recovery of the isolated heart ventricle of the rat after a period of anoxia was studied under varying conditions. The recovery of contractibility was inversely proportional to the duration of anoxia, the frequency of stimulation, and the temperature of the medium.

A66-80651
THE EFFECT OF STARVATION AND LONG-TERM EXERCISE ON FATTY ACID COMPOSITION OF ADIPOSE TISSUE AND THE EFFECT OF ADRENALIN ON THE COMPOSITION OF FATTY ACIDS RELEASED BY ADIPOSE TISSUE IN VITRO.
M. Kohout, T. Braun, and J. Parizkova (Inst. of Human Nutr., Cardiovascular Res. Inst., and Res. Inst. for Phys. Culture, Prague, Czechoslovakia).
Physiologia Bohemoslovenica, vol. 14, 1965, p. 276–281. 23 refs.

The percentage composition of individual fatty acids in epididymal adipose tissue remained unchanged in rats starved for 120 hrs. Addition of adrenaline to adipose tissue in vitro resulted in palmitoleic and sometimes also palmitic acid being released to a greater extent than corresponded to their relative amount in the glycerides of the tissue. Release of oleic acid, on the other hand, was smaller. Epididymal adipose tissue from rats trained to run on a running belt 3–5 min. daily contained less palmitoleic acid than the same tissue in control animals. A positive correlation was found between the amount of palmitoleic acid in adipose tissue and total body fat content.

A66-80652
THE EFFECT OF ADRENALECTOMY ON ADAPTATION TO HYPOXIA IN THE RAT. CHANGES IN HAEMOGLOBIN CONCENTRATION AND OSMOTIC RESISTANCE OF ERYTHROCYTES IN PERIPHERAL BLOOD.
Z. I. Barbashova, K. Krofta, J. Procházka, K. Rakušan, J. Skřivanova, and O. Poupa (USSR, Acad. of Sci., Inst. of Evolutionary Physiol. and Biochem., Leningrad; and Czechoslovak Acad. of Sci., Inst. of Physiol., Prague).
Physiologia Bohemoslovenica, vol. 14, 1965, p. 324–327. 5 refs.

Adrenalectomy leads to permanent anemia in rats, but osmotic resistance of erythrocytes (ORE) is not altered. Adaptation of adrenalectomized rats to hypoxia (7000 m.) for 4–7 weeks increased ORE as in normal adapted rats, indicating relative independence of these reactions to regulatory adrenal cortex hormones. The hemoglobin content of the blood, however, increased less in operated adapted rats than in unoperated animals and thus it is thought that cortical hormones may set the level of the adaptive reactions to hypoxia.

A66-80653
THE EFFECT OF THE FREQUENCY OF FOOD INTAKE ON THE RATE OF BODY WEIGHT LOSS, NITROGEN EXCRETION AND SURVIVAL TIME IN RATS DURING SUBSEQUENT COMPLETE STARVATION.
P. Fábry, L. Kazdová, T. Braun, and A. Jandová (Inst. of Human Nutr., Dept. of Physiol., Prague, Czechoslovakia).
Physiologia Bohemoslovenica, vol. 14, 1965, p. 472–475. 19 refs.

Rats which were fed only two hours a day, for 8 months starting from the time of weaning, were compared with control animals which had unlimited access to food. Both groups were subjected to starvation until they died. The experimental rats lost weight more rapidly, excreted 47% more nitrogen, and died faster than the control rats. Their life period was only 57% of the control. The ratio of nitrogen loss to loss of total body weight was the same in both groups. It is believed that the decreased resistance to acute prolonged starvation in the experimental group is due to the persistance of a higher level of tissue metabolism in such animals.

A66-80654
THE EFFECT OF THE COMBINED ACTION OF RADIOIODINE-131 AND NOISE ON THE CARDIAC ACTIVITY IN DOGS [VLIIANIE KOMBINIROVANNOGO DEISTVIIA J^{131} I SHUMA NA SERDECHNUIU DEIATEL'NOST' SOBAK].
T. Mukhamedov (Inst. of Reg. Exptl. Med., Tashkent, Uzbek SSR).
Biulleten' Eksperimental'noi Biologii i Meditsiny, vol. 59, Feb. 1965, p. 43–46. 15 refs. In Russian.

Prolonged administration of I^{131} in a dose of 4–5 μc/kg. caused changes in the electrocardiogram (ECG) waves and intervals (deceleration of the cardiac contractions, increase in the PQ and QT intervals and in the P wave, shifting of the ST intervals to below the isoelectric line) especially distinct in functional loading. Noise (100–105 db.) caused moderate ECG changes (deceleration of cardiac contractions, diminuation of the PQ and QT intervals as well as of the P wave). The combined action of these factors produced the same changes as in the case with iodine-131 alone (deceleration of cardiac contraction, an increase in the PQ and QT intervals, reduction of the P wave, an increase of the R wave, shifting of the ST to below the isoelectric line, appearance of the biphasic negative T wave). However, these changes appeared earlier and were more pronounced.

A66-80655
THE ROLE OF REFLEXES FROM THE SINOCAROTID ZONE IN RESPIRATION CONTROL IN EXCESSIVE INTRAPULMONARY OXYGEN TENSION [ROL' REFLEKSON S SINOKAROTIDNOI ZONY V REGULIATSII DYKHANIIA PRI IZBYTOCHNOM VNUTRILEGOCHNOM DAVLENII KISLORODA].
G. G. Chernova, M. V. Kirzon, and V. A. Safonov (M. V. Lomonosov Moscow State U., Dept. of Animal Physiol., Moscow, USSR).
Biulleten' Eksperimental'noi Biologii i Meditsiny, vol. 59, Feb. 1965, p. 50–54. 10 refs. In Russian.

A study was made of the effect produced by occlusion of the common carotid arteries and denervation of the sinocarotid area in cats on respiration under excessive intrapulmonary oxygen tension (30 mm. Hg). Occlusion of the common carotid arteries caused a decrease in apnea period as a result of the excessive intrapulmonary oxygen tension, whereas denervation of sinocarotid area caused an increase of this value. During the increased intrapulmonary oxygen tension, occlusion of the common carotid arteries and denervation of the sinocarotid zone produced no significant effect on the time of respiratory arrest. A conclusion is drawn that the reflexes from the sinocarotid area have an activating effect on respiration in conditions of excessive intrapulmonary tension.

A66-80656
PHOSPHORYLATION OF FRUCTOSE IN RAT SKELETAL MUSCLES AND LIVER IN HYPOXIA [FOSFORILIROVANIE FRUKTOZY V SKELETNYKH MYSHTSAKH I PECHENI KRYS PRI GIPOKSII].
V. V. Postupaev (I. P. Pavlov First Leningrad Med. Inst., Dept. of Biochem., Leningrad, USSR).
Biulleten' Eksperimental'noi Biologii i Meditsiny, vol. 59, Feb. 1965, p. 62–63. 10 refs. In Russian.

Phosphorylation of fructose in rat skeletal muscles and liver was studied after exposure to lowered atmospheric pressure (190 mm. Hg) for 1.5 hours. Fructokinase activity was not altered significantly under these conditions.

A66-80657
ABSORPTIVE CAPACITY OF THE INTESTINE AND STOMACH IN WATER AND GENERAL STARVATION [VSMOKTUVALNA DIIALNIST KYSHECHNYKA I SHLUNKA PRY VODNOMU I ZAHALNOMU HOLODUVANNI].
R. O. Faitelberh and L. I. Frolova (I. I. Mechnikov Odessa State U., Dept. of Human and Animal Physiol., Odessa, UkrSSR).
Fiziolohichnyi Zhurnal, vol. 11, Jul.–Aug. 1965, p. 463–469. 11 refs. In Ukrainian.

The authors investigated the absorptive capacity in the small intestine and, partly, in the stomach during water and general starvation and under conditions of saturation of the organism with water. The experiments were conducted on dogs with an isolated jejunum loop by Thiery's method, 22–25 cm. long and on a dog with an isolated Pavlov pouch. It was established that absorption of water and glucose is intensified during long (three–five days) deprivation of water, while on the fifth day the intensity of water absorption markedly decreases and constitutes 37%. After cessation of water starvation, absorption of water returns to the initial level. Absorption of water and glucose decreases sharply during prolonged general starvation. Depriving the organism of food and water in the course of four–five days is attended by absorption of water and glucose in the small intestine.

A66-80658
SIGNIFICANCE OF THE HIGHER DIVISIONS OF THE CENTRAL NERVOUS SYSTEM IN THE MECHANISMS OF INTERACTION OF THE RESPIRATORY AND VASOMOTOR CENTERS DURING DEVELOPMENT OF HEMIC HYPOXIA AND IN THE PROCESS OF FUNCTIONAL RESTORATION [ZNACHENNIA VYSHCHYKH VIDDILIV TSENTRALNOI NERVOVOI SYSTEMY U MEKHANIZMAKH VZAEMODII DYKHALNOGO I SUDYNORUKHOVOHO TSENTRIV PRY ROZVYTKU HEMICHNOI HIPOKSII TA V PROTSESI VIDNOVLENNIA FUNKTSII ORHANIZMU].
IA. M. Brytvan (Vinnitsa Med. Inst., Vinnitsa UkrSSR).
Fiziolohichnyi Zhurnal, vol. 11, Sep.–Oct. 1965, p. 583–589. 19 refs. In Ukrainian.

The interactions of the respiratory and vasomotor centers are not the same at various stages of hemic hypoxia, and depend on the rate, intensity and duration of the course of hypoxia. During rapid development of massive loss of blood, acute vascular insufficiency, intense excitation of respiration and excessive inhibition of the cerebral cortex are soon detected. During slow development of hemic hypoxia due to fractional hemorrhage or poisoning with methemoglobulin-formers, arterial blood pressure falls gradually; the initial phase of respiratory excitation is most often attended by intensification of the electrical activity of the cerebral cortex. Dissimilar ratios were found between the cortical biocurrents and the thalamic division of the brain. In some cases parallel intensification of biopotentials were noted; in others, there was a positive induction of the thalamic division. As hypoxia grew, synchronization appeared in the cortical and thalamic rhythms, as well as a gradual fall in the frequency and amplitude of the slow rhythms. A typical feature of the transitional stage of hemic hypoxia is the appearance of synchronous fluctuations of Cheyne–Stokes breathing and of slow waves of the third order of arterial blood pressure. They may be regarded as a peculiar form of the defensive reaction of the organism. It should be noted that in the transitional stage of hypoxia, dissociation of the functions of the respiratory and vasomotor centers is possible. There was also in hemic hypoxia a dependence of the interaction of the respiratory and vasomotor centers on the altered initial functional state of the central nervous system, evoked by anesthesia, aminazine, phenamine and the exclusion of the blood pressure regulators.

A66-80659
THE PLANETARY FOOD POTENTIAL.
Walter R. Schmitt (Calif. U., San Diego).
Annals of the New York Academy of Sciences, vol. 118, Art. 17, Mar. 5, 1965, p. 645–718. 75 refs.

While this review is primarily concerned with terrestrial food problems in relation to the population increase, extensive sections are devoted to nutrition aspects pertinent to bioastronautics. The food problem is primarily a socioeconomic one, and technically nutritional prospects for the future appear to be excellent if new and unorthodox foodstuffs are considered and potential resources from the arid regions and oceans adequately exploited. Most of the protein needs will be satisfied from aquatic and microbial cultures. Genetic efforts should be directed to the development of salt-tolerant crop plants that can be irrigated with sea water. Cyclic returning of man's metabolic and industrial wastes to the producing land is recommended. Studies of food conversion of terrestrial poikilotherms may prove them to be highly efficient converters of protein and useful protein nutrients. Microorganisms, such as unicellular algae capable of synthesizing compounds suitable for human consumption from solar energy and inorganic matter, merit special attention. Water reclamation and recycling is recommended as an effective course to follow rather than desalination, which is of use only in the coastal regions when applied to brackish water.

A66-80660
INVESTIGATIONS REGARDING THE REACTIONS OF SERUM IRON DURING ACUTE PHYSICAL STRESS IN TRAINED AND UNTRAINED PERSONS [UNTERSUCHUNGEN UBER DAS VERHALTEN DES SERUMEISENS IM VERLAUF EINER AKUTEN KORPERLICHEN BELASTUNG BEI TRAINIERTEN UND NICHT TRAINIERTEN PERSONEN].
G. Bruschke, H. Wuschech, H. Hasselbarth, H. Herrmann, and D. Voigt (I. Med. Universitatsklin. der Charite, Berlin, East Germany).
Das Deutsche Gesundheitswesen, vol. 20, Dec. 2, 1965, p. 2143–2145. 18 refs. In German.

An increase in serum iron content over the initial values was observed in both physically trained and untrained individuals after acute physical stress (20 min. work on a bicycle ergometer at 200 W). This increase is thought to be due to a shift in the autonomic nervous function evoked by physical stress.

A66-80661
EYE MOVEMENTS OF WAKING SUBJECTS WITH CLOSED EYES: A COMPARISON BETWEEN NORMALS AND CHRONIC SCHIZOPHRENICS.
Yasuo Shimazono, Katsumi Ando, Shingi Sakamoto, Tsunetaka Tanaka, Tomtyuki Eguchi, and Hajime Nakamura (Kanazawa U. School of Med., Dept. of Neuropsychiat., Kanazawa, Japan).
Archives of General Psychiatry, vol. 13, Dec. 1965, p. 537–543. 18 refs.

Data from 50 normals and 50 chronic schizophrenics at rest and following various types of stimulation may be summarized as follows. Horizontal eye movements have been classified into two groups, S- and R-groups, and have been subdivided by amplitude into S, s, R, and r types. Generally, the eye movements in the S-group appeared in relaxed subjects. On the other hand, those in the R-group tended to appear in subjects who were in a state of anxiety and mental tension. The s movements appeared in 44 of 50 normals (88%) whereas only nine of 50 schizophrenics (18%) showed them. There were 16 of 50 normals showing no r movements, whereas all schizophrenics showed r movements and half were at the higher rate. There was no remarkable correlation between the mean rates of r-type eye movements and the values of percentage time alpha of the EEG (electroencephalogram) for schizophrenics and normals.

A66-80662
FUNCTIONAL ORGANIZATION OF HAIRY SKIN IN RESPONSE TO SENSORY STIMULI.
R. Siminoff (Eastern Pa. Psychiat. Inst., Dept. of Basic Res., Philadelphia).
Experimental Neurology, vol. 13, Dec. 1965, p. 331–350. 20 refs.

The cross correlation methods previously developed for the analysis of peripheral nerve activity in response to natural stimuli were used to study the functional organization of the hairy skin of the cat. Histological methods were used to supplement these findings. For the myelinated fiber groups, the innervation to the caudal area of skin conducts faster than the innervation to the rostral end. The skin contains two specific mechanoreceptors. The first is to the hair, is rapid-adapting and responds to movement of the hairs. These receptors are innervated by the A, alpha-beta group (high sensitivity) and the A, delta-gamma group (low sensitivity). The second type of receptor is to the skin between the hair shafts and responds to touching the skin; these receptors are not as rapidly adapting and are innervated primarily by the A, delta-gamma group. The C-fiber activity is associated with nonspecific activity in response to various mechanical stimuli. Within each sub-area there is considerable time-sharing of myelinated fibers by receptors. Cutaneous sensibility consists of specific mechanoreceptors which are supplied by myelinated fibers and subserve the basic modality of touch (hair and pressure). Nonspecific activity in response to C-fiber activity subserve the sensations of pain and temperature which are not basic modalities but the result of pattern recognition of specific and nonspecific activities.

A66-80663
PITCH-DISCRIMINATION AT HIGH FREQUENCIES BY AIR- AND BONE-CONDUCTION.
John F. Corso (N. Y. State U., Cortland) and Murray Levine.
American Journal of Psychology, vol. 78, Dec. 1965, p. 557–566. 21 refs. Grant Natl. Inst. of Neurol. Diseases and Blindness B-2006(R1).

The present study was performed to investigate pitch-discrimination for sonic and ultrasonic frequencies presented by monaural air- and bone-conduction. Five groups of observers with normal hearing and high pitch-ability were tested at six frequencies from 2000 to 57,000~ at a loudness-level of 20 phons. The results obtained by the method of constant stimulus-differences indicate that: (1) at 200~ the difference-limens for pitch discrimination are approximately equal for air- and bone-conduction, but from 4000–14,000~ the difference-limens are significantly smaller for bone-conduction; and (2) pitch-discrimination is absent for bone-conducted tones in the ultrasonic region. It is concluded that with respect to pitch-discrimination there is no functional difference between the two modes of acoustic transmission, but the apparent superiority of discrimination by bone-conduction suggests that there may be a loudness-difference between tones presented via air- and bone-conduction or that the role of the ossicular chain in air-conduction may impose a limiting factor on pitch-discrimination.

A66-80664
THE ROLE OF KNOWLEDGE IN DISTANCE-PERCEPTION.
Howard E. Gruber (New School for Social Res., New York, N. Y.) and Albert J. Dinnerstein (N. Y. Med. Coll., New York).
American Journal of Psychology, vol. 78, Dec. 1965, p. 575–581. 12 refs.

The distances of nonequidistant pairs of luminous squares in a dark field were judged by college students in two experiments. Control groups judged without knowledge and experimental groups with knowledge of the objective distances. In Experiment I, the stimuli were of the same retinal size. Knowledge of distance influenced perceived absolute distance but not perceived relative distance. In Experiment II, the retinal-size ratio of the stimuli was varied. Again, knowledge influenced perceived absolute distance but not perceived relative distance. Stimulus-size ratio influenced perceived relative distance but not perceived absolute distance. Viewed binocularly, the stimuli appeared nonequidistant; monocularly, they seemed equidistant or almost so. By opening and closing one eye, this phenomenal shift could be repeated indefinitely. These results show that knowledge has little influence on perceived relative distance.

A66-80665
MEMORY-SPAN WITH EFFICIENT CODING PROCEDURES.
Irwin Pollack and Lawrence B. Johnson (AF Systems Command, Bedford, Mass.)
American Journal of Psychology, vol. 78, Dec. 1965, p. 609–614. 5 refs.

Binary verbal messages and tachistoscopic materials were presented before, and after, instruction with a binary to decimal digit-code. There was substantial improvements in memory-span for verbal messages after coding. Tachistoscopic materials was only slightly affected. The effect of coding is enhanced by compatible message formats and at slow rates of presentation. Effective utilization of efficient coding procedures requires sufficient time for recording operations.

A66-80666
INDIVIDUAL VARIATIONS IN THE POSTOCULAR LINES OF REGARD.
Marshall B. Jones (Fla. U., Gainesville).
American Journal of Psychology, vol. 78, Dec. 1965, p. 627–633.

A straight edge was set up directly in front of, at the same level as, and pointing directly at subject's one open eye, in monocular vision. The subject was then asked to indicate when a touch on his scalp seemed to him to be lined up with the straight edge. So defined, the right and left postocular lines were found generally to lie closer to the midline of the head than to the respective optical axes. The midpoint of the two lines lay consistently to the left of the midline. The variance of the left was greater than the variance of the right postocular line. Intra-class correlation in a collection of 26 sets of identical twins was greater for the right line than for the left. Hand- and eye-dominance seemed not to bear upon the results. The interpretation is offered that both postocular lines are influenced by heredity and environment, that environmental influences produce the leftward tendency of the two lines, and that this tendency is more powerfully felt in the left line.

A66-80667
DETECTION IN A HOMOGENEOUS VISUAL FIELD UNDER A CONDITION OF INFINITE DEPTH OF FOCUS.
John Catalano and Milton S. Katz (U. S. Naval Training Device Center, Port Washington, N. Y.)
American Journal of Psychology, vol. 78, Dec. 1965, p. 634–639. 6 refs.

It has been proposed by Whiteside (1957) that, in a homogeneous visual environment, involuntary accommodation results in a myopic condition which impairs target-detection. A means of overcoming this myopia by approximating a condition of infinite depth of focus with the use of an artificial pupil was studied. No improvement of target-detection resulted from the procedure.

A66-80668
PHYSIOLOGICAL FACTORS IN DECOMPRESSION SICKNESS.
Abraham T. K. Cockett, Robert M. Nakamura, and Ray T. Kado (Harbor Gen. Hosp., Torrance, Calif.; and Calif. U. School of Med., Depts. of Surg., Urol., and Pathol., Los Angeles).
Archives of Environmental Health, vol. 11, Dec. 1965, p. 760–764. 14 refs.
NASA Grant NsG 237-62 and Contract OSR AF-49(638)-1387.

Experiments are described which tested the efficacy of two therapeutic modalities (plasma replacement by dextran and moderate total body hypothermia for 6 hr.) after subjecting mongrel dogs to lethal overcompression-decompression. All eight animals treated with dextran following decompression are alive and well at the present time. The animals' activity, appetite, and gross behavior are normal. None of these animals has lost weight since the experiment. Five of six dogs undergoing hypothermia followed by dextran survived and appear healthy. One animal died. The eighteen control animals which died within six hours following decompression exposure showed pathological changes of a general nature in the lungs, livers, kidneys, and brains. Both dextran plasma replacement and hypothermia appear to be useful therapeutic measures in decompression sickness and are indicated. However, recompression is the treatment of choice.

A66-80669
COVERT PATHOGENESIS OF NO_2 INDUCED EMPHYSEMA IN THE RAT.
G. B. Haydon, G. Freeman, and N. J. Furiosi (Stanford Res. Inst., Dept. of Med. Sci., Menlo Park, Calif.)
Archives of Environmental Health, vol. 11, Dec. 1965, p. 776–783. 6 refs.

Rats exposed to 0.8, 4, and 12 ppm atmospheric NO_2 developed respiratory disease. At the lower concentrations, the process was relatively covert and survival was longer. Histopathologic lesions became more advanced with longer exposure. Rats sacrificed after 16 weeks of exposure to 4 ppm of NO_2 exhibited the early histopathologic changes associated with higher concentrations. One rat, observed after breathing 0.8 ppm for 16 weeks, had not yet developed histopathological changes, although all members of the group had been tachypneic continuously. Tachypnea was regular in all rats at all exposures of NO_2. Proliferative changes of the bronchial and bronchiolar epithelium and occasional ruptured alveolar walls were observed. Certain pathological changes were seen to persist as long as 36 weeks after removal of the rats from NO_2. The experimental results in rats show that living in a favorable controlled environment may minimize the potential hazard of NO_2 for the aged human population, particularly with chronic pulmonary and cardiovascular disease. Widespread, low-level concentrations of NO_2 in air and transient high concentrations in tobacco smoke may contribute to chronic obstructive respiratory disease.

A66-80670
URINARY BLADDER CALCULI FORMED IN RATS AT ALTITUDE.
Abraham T. K. Cockett, R. M. Nakamura, and D. S. Miyada (Harbor Gen. Hosp., Torrance, Calif.; and Calif. U. School of Med., Depts. of Surg., Urol., and Pathol., Los Angeles).
Archives of Environmental Health, vol. 11, Jan. 1966, p. 810–813. 5 refs.
NASA Grant NsG 237-62 and Contract OSR AF-49(638)-1387.

A method is outlined for the formation of experimental bladder calculi in male rats. Chemical analysis of bladder calculi formed in rats at an altitude of 18,000 feet for a period of nine weeks reveals no significant differences from calculi formed in rats at ground levels. Infrared spectral analysis confirms the quantitative chemical findings. There was an increased incidence of Proteus organisms in the altitude group.

A66-80671
THE AVERAGED ELECTRICAL RESPONSES TO DIFFUSE AND TO PATTERNED LIGHT IN THE HUMAN.
Rainer Spehlmann (Mayo Clin. and Mayo Found., Rochester, Minn.)
Electroencephalography and Clinical Neurophysiology, vol. 19, 1965, p. 560–569. 53 refs.
Grant PHS NB 03225.

A marked difference was obtained in the average electrical responses of normal subjects when patterned light was used for stimulation instead of diffuse light. This difference is manifested mainly by the presence of a surface-positive "late wave" (180–375 msec.), the amplitude of which varies with the density of contrast borders between black and white lines of the stimulus pattern. The different effect of diffuse and patterned light was also manifested with paired and with repetitive stimuli. Since the "light response", the "cortical excitability cycle" and the "driving" vary with comparatively subtle changes of the input, these evoked phenomena cannot be considered to be only expressions of invariable cortical characteristics. Spontaneous or induced changes in attention or variations in light intensity affected both types of responses in the same sense. Because the "late wave" depends on the peripheral input and because it is limited to the posterior head regions like the other components of light responses, it should be considered "specific" notwithstanding its long latency.

A66-80672
PRECISION OF COLOR DIFFERENCES DERIVED FROM A MULTIDIMENSIONAL SCALING EXPERIMENT.
Hilton Wright (Natl. Res. Council, Div. of Appl. Phys., Ottawa, Canada).
Journal of the Optical Society of America, vol. 55, Dec. 1965, p. 1650–1655. 14 refs.

A multidimensional ratio-scaling method was used to analyze one observer's color difference judgments made on two sets of colored tiles of equal luminous reflectance. The precision of the observed color differences was found to be approximately ± 30%. Taking this precision into account, the analysis indicated that all colors could be represented by points in a two-dimensional Euclidean space in which distances between two points were proportional to observed color differences independent of the location of the points. A method involving relatively simple computations is used to derive the perceptual space for a large group of colors by dividing the group into several subgroups and then overlapping the scaling solutions obtained for each subgroup.

A66-80673
CATEGORY JUDGMENTS AS FUNCTIONS OF FLASH LUMINANCE AND DURATION.

Mark F. Lewis (Columbia U., New York, N. Y.)
Journal of the Optical Society of America, vol. 55, Dec. 1965, p. 1655–1660. 12 refs.
Grant Natl. Inst. of Mental Health 1 F1 MH-19, 820-01.

A method for obtaining suprathreshold, constant-response functions from category judgments was developed and illustrated by obtaining judgments for flashes of varying luminance and duration in the fovea. The contours show agreement with Bloch's law; no Broca–Sulzer effect was obtained. A second experiment indicated that the method is sensitive to context effects. No reliable variation in the critical duration was found with changes in luminance level.

A66-80674
VISUAL RECOVERY FROM BRIEF EXPOSURES TO HIGH LUMINANCE.
Norma D. Miller (Ohio State U., School of Optometry, Columbus).
Journal of the Optical Society of America, vol. 55, Dec. 1965, p. 1661–1669. 5 refs.
AF Systems Command supported research.

The maxwellian-view optical system provided a circular flash field of 10^{o} diam, and at the peak of the flash, the field luminance was 5.4×10^{5} L. A rotating-mirror shutter system permitted flash durations of 1.4 to 0.64 msec. with constant pulse shapes for all durations. The maximum flash energy was 4×10^{7} td-sec. or 0.042 cal./cm.^{2} at the retina, neglecting losses in the ocular media. With the infrared removed by filtering the beam, the maximum energy was reduced to 3×10^{7} td-sec. or 0.012 cal./cm.^{2}. The criterion measure for visual performance following the flashes was the identification of Sloan–Snellen letters of different sizes. The letters were transilluminated with luminances from 130 to 0.03 mL. The effect of removing the infrared portion of the flash radiance on the recovery times for a given level of visual performance was tested and found negligible. The other variables studied were the size of the flash field and the duration of the flash. The time course of recovery following various flash energies was investigated by varying the letter size and the letter luminances.

A66-80675
INFRARED IMAGE-CONVERTER METHOD OF OBSERVING EYE MOTION IN FLASH BLINDNESS EXPERIMENTS.
John M. Davies and Arthur Levine (U. S. Army Natick Labs., Pioneering Res. Div., Natick, Mass.)
Journal of the Optical Society of America, vol. 55, Dec. 1965, p. 1670–1671. 5 refs.

An infrared image converter is proposed for observing eye motion in experiments in which the optokinetic nystagmic reflex motion is used to indicate recovery of vision after the flash blinding. Illumination is provided by an incandescent lamp with a filter which transmits only above 0.9μ. One experiment was performed on a single human subject, using a photoflash lamp for the blinding light and a faint moving light for the test pattern. For exposures up to 0.017 J cm.$^{-2}$ the duration of blindness increased linearly with exposure. The durations determined by the subject and by the observer agreed very well.

A66-80676
ONE-STAGE MODEL FOR VISUAL TEMPORAL INTEGRATION.
John Levinson (Bell Telephone Labs., Inc., Murray Hill, N. J.)
Journal of the Optical Society of America, vol. 56, Jan. 1966, p. 95–97. 10 refs.

Many characteristics of visual temporal integration, found in both psychophysics and physiology, have been thought of as arising from a number of cascaded integrations, or exponential delays. As an alternative, a single process is proposed which has a temporal response identical with that of the many-stage model. This process is readily visualized as taking place within a single receptor cell. It consists of a number of subprocesses, the number being proportional to the number of photons absorbed. Each subprocess consists of three steps: (1) initiation by photon absorption, (2) counting of a series of random events, and (3) emission of a signal when the count reaches a specific number. Response is taken to be the summation of all the signals produced by the subprocesses. Temporal delay and spread of the response is entirely attributed to the time required to accumulate the independent random events of step (2). Possible physiological correlates of the three steps are touched on, but only speculatively.

A66-80677
GLARE: ITS MEASUREMENT BY CONE THRESHOLDS AND BY THE BLEACHING OF CONE PIGMENTS.
W. A. H. Rushton and R. W. Gubisch (Cambridge U., Physiol. Lab., Great Britain).
Journal of the Optical Society of America, vol. 56, Jan. 1966, p. 104–110. 19 refs.
Grant Natl. Inst. of Neurol. Diseases and Blindness NB 03014-04.

The visual threshold of the fovea is raised by a surrounding 'glare' ring of bright light. If this is due entirely to scattered light, then the equivalent uniform background that raises the threshold equally will bleach the cone pigments equally. The equivalence of bleaching was measured by two different techniques: retinal densitometry, and the effect on subsequent dark adaptation. Both agree that the background which matches the glare in raising the threshold for foveal cones also matches it (correct to 0.1 log unit) in bleaching the pigment in those same cones.

A66-80678
EFFECT OF WAVELENGTH AND BANDWIDTH OF RED LIGHT ON RECOVERY OF DARK ADAPTATION.
Mary M. Connors (U. S. Naval Submarine Med. Res. Lab., U. S. Naval Submarine Base, Groton, Conn.)
Journal of the Optical Society of America, vol. 56, Jan. 1966, p. 111–115. 10 refs.

Recovery curves were run following 1- and 5-min. adaptation to wavelengths ranging from 595 to 670 mμ taken at 15-mμ intervals at a luminance of 100 ft.-L. The effects of near-monochromatic and broad band-widths were investigated. Recovery curves are in terms of time necessary to return to a predetermined dark-adapted threshold and to stated values above that threshold. After one minute of adaptation to a light of 610 mμ, recovery is faster than after exposure to an equally bright light of 595 mμ. Lengthening the wavelength causes no further reduction in recovery time. After five minutes of similar adaptation, recovery time is progressively shortened by lengthening the wavelength to 640 mμ. Further increases in wavelength result in recovery times equivalent to those of the 640-mμ adaptation. Spreading the bandwidth from near monochromatic to 30 mμ has no effect on subsequent recovery, although further broadening the bandwidth to include the shorter wavelengths results in reduced sensitivity for the 595-mμ setting. These findings are consistent with luminosity theory.

A66-80679
VALIDATION OF AN INDICATOR OF MAMMALIAN RETINAL RECEPTOR RESPONSE: DENSITY OF STAIN AS A FUNCTION OF STIMULUS MAGNITUDE.
Jay M. Enoch (Washington U. Med. School, Oscar Johnson Inst., Dept. of Ophthalmol., St. Louis, Mo.)
Journal of the Optical Society of America, vol. 56, Jan. 1966, p. 116–123. 16 refs.
Grant NIH NB-K3-15, 138 and NB-02168-05.

A bipartite field (retinal irradiance ratio 2:1 on the two sides) was imaged on the retina of an albino rat. Following exposure to the visual stimulus, the retina was dissected from the eye and placed in an incubation medium which selectively stains the ellipsoid portion of photoreceptors which have been exposed to light. In this study, the optical density of stain was measured as a function of stimulus magnitude. It was shown that the density of stain increased with increasing retinal irradiance over the range of values tested. The indicator system tended to underestimate differences in stimulus magnitude, and showed evidence of approaching an asymptote at higher stimulus levels. Many technical problems encountered in this experiment made this a difficult exercise.

A66-80680
FUNDAMENTAL RESPONSE CURVES OF A NORMAL AND A DEUTERANOMALOUS OBSERVER DERIVED FROM CHROMATIC ADAPTATION DATA.
P. L. Walraven, A. M. J. van Hout, and H. J. Leebeek (Inst. for Perception RVO-TNO, Soesterberg, The Netherlands).
Journal of the Optical Society of America, vol. 56, Jan. 1966, p. 125–127. 10 refs.

A zone theory of color vision is discussed. It presumes three kinds of cones with maximum sensitivities at different parts of the spectrum in a ratio of 10:10:1. A brightness signal and two antagonistic chromaticness signals are transmitted through separate channels. The brightness signal is the sum of brightness contribution of the three different cone systems. Chromaticness information is obtained from (a) a red-green center and (b) a yellow-blue center in which the yellow signal is the addition of the red and green and the blue signal arrives from the blue system. In support are cited data on luminosity curves before and after adaptation to wavelength of 500 and 650 nm, obtained from a deuteranomalous and a normal observer.

A66-80681
THERMOREGULATION IN ANIMALS IN A HELIOOXYGENIC ATMOSPHERE [K VOPROSU O TERMOREGULIATSII ZHIVOTNYKH V GELIO-KISLORODNOI ATMOSFERE].
E. A. Konza (USSR, Acad. of Sci. I. P. Pavlov Inst. of Physiol., Leningrad).
Doklady Akademii Nauk SSSR, vol. 165, no. 4, Feb. 1, 1965, p. 959–961. 10 refs.

Albino mice exposed to different ambient temperatures in an atmosphere containing 21% O_2 and 79% He showed that the lowest rate of metabolism remained the same as in normal air atmosphere of 30° C. The volume of oxygen consumption, however, was increased. At lower temperatures the increase was greater as the temperatures decreased. The body temperatures

fell faster in the helium atmosphere than in the air, but the animals tolerated the higher ambient temperatures better than in the air. All mice exposed to 40° C. in normal air expired, while those in the helium atmosphere survived. The experiments show that the oxygen–helium mixture has a greater conductance of heat than the oxygen–nitrogen mixture.

A66-80682
OXYGEN EFFECT [KISLORODNYI EFFEKT].
Aviatsiia i Kosmonavtika, no. 10, Oct. 1965, p. 35. In Russian.

Studies showed that microorganisms, insects, plants, and animals are less susceptible to ionizing radiation under hypoxic conditions. The same effect was noted when ambient oxygen was displaced by nitrogen oxide or certain inert gases. However, this effect was not observed in cases of exposure to alpha particles or protons.

A66-80683
RADIATIONAL BARRIER DURING LUNAR MISSION [RADIATSIONNYI BAR'ER NA PUTI K LUNE].
V. Antipov, N. Dobrov, M. Nikitin, and P. Saksonov.
Aviatsiia i Kosmonavtika, no. 12, Dec. 1965, p. 26–28. In Russian.

During lunar missions, the astronauts will be subjected to various types of radiation, including primary cosmic radiation, which beyond the geomagnetic field may be equal to 125–270 millibers (ber = biological equivalent roentgen) in 24 hrs. of exposure for each man. The total amount during a 15-day period required for a lunar flight may reach 1.8–4 ber for each individual. The second important source of radiation is the radiation belts surrounding the earth, which may be of such intensity that a man inside the space cabin with a shielding of 1 g./cm.^{2} is exposed to 5 ber/min. The sum of the radiation exposures may amount to 2.5–3.5 ber. Additional radiation may come from solar flares which may amount to 25 ber. To protect a man from solar flares of such intensity a shielding of 28–32 g./cm.^{2} will be required. Flight safety problems include: (1) choice of orbits with least exposure to the magnetic cavity radiation; (2) choice of periods of minimum solar activity; (3) adequate shielding; (4) choice of effective biochemical protectors.

A66-80684
THE EFFECT OF STARVATION ON THE FATTY ACID COMPOSITION OF THE MYOCARDIUM IN RATS.
M. Kohout, T. Braun, C. Michalec (Med. Fac., Lab. for Proteosyn, Inst. for Cardiovascular Res., and Inst. of Human Nutr., Prague, Czechoslovakia).
Physiologia Bohemoslovenica, vol. 14, 1965, p. 460–465. 26 refs.

Male Wistar rats were starved for 72 and 120 hrs. The fatty acid composition of their myocardium changed; the unsaturated fatty acid content increased. In the triglycerides C 12 : 0 to C 17 : 0 fatty acid content decreased and oleic acid content increased. In the phospholipids the palmitic acid content decreased and that of linoleic acid increased. The triglyceride fatty acid composition of heart muscle approached that of adipose tissue triglycerides during starvation.

A66-80685
CONCENTRATION AND DILUTION OF URINE IN PERMANENT INHABITANTS OF HOT REGIONS.
A. I. Katz, S. Massry, J. Agmon, and M. Toor (Histadrut Inst. of Occupational Health and Environ. Physiol.; and Beilinson Hosp., Sick Fund, Third Med. Dept., Petah Tiqva, Israel).
Israel Journal of Medical Sciences, vol. 1, Sep. 1965, p. 968–978. 29 refs.
Also published in: Harefuah, vol. 49, Dec. 15, 1965, p. 397–404. In Hebrew.

The concentration and dilution of urine were examined in 20 healthy young subjects, permanent residents of the hot areas of Israel, in 14 exercise and 32 rest experiments on five nonconsecutive days. The study was performed at high environmental temperatures under fluid deprivation with and without exogenous vasopressin, as well as during forced hydration. Renal hemodynamics and maximal free water reabsorption were determined during mannitol diuresis. Exogenous vasopressin did not bring about higher urine osmolalities. During exercise without fluid intake, urine osmolalities were even lower than those attained during rest. Effective renal plasma flow and glomerular filtration rate were at the lower limit of normal. Maximal free water reabsorption during mannitol diuresis was within the normal range. In all dehydration experiments low urinary urea concentrations were found. The possible mechanisms underlying the subjects' inability to achieve higher urine osmolalities are discussed. During rest and exercise with forced fluid intake, maximally diluted urines were formed, indicating the efficient diluting ability of the kidney, provided a positive water balance is maintained.

A66-80686
DOES MAN IN A HOT CLIMATE ADAPT TO WATER DEPRIVATION?
O. G. Edholm (Med. Res. Council Labs., Hamstead, London, Great Britain).
Israel Journal of Medical Sciences, vol. 1, Sep. 1965, p. 1046–1047.

Studies investigating the problem of adaptation to dehydration in permanent residents of hot climates are reviewed. The results are consistent with the view that man in a hot environment does not adapt to water deprivation. Both during exercise and rest, men in a hot climate produced a less concentrated urine rather than a more concentrated urine as seen in desert animals such as the kangaroo rat. The possible mechanisms of reduced glomerular filtration rate are discussed.

A66-80687
ASSESSMENT OF PHYSIOLOGICAL STRESS DURING CLIMBING.
Carl Zenz and Byron A. Berg (Allis-Chalmers Manuf. Co., Milwaukee, Wis.)
American Industrial Hygiene Association Journal, v. 26, Nov.–Dec. 1965, p. 574–578. 14 refs. St. Luke's Hosp. Res. Found. supported research.

Measurement of certain physiological variables during work are readily obtainable and are known to be significant for determination of energy expenditure. This investigation was a working test conducted in the plant, using suitably erected scaffolding for a vertical climb of 20 feet. Eighteen healthy workers (age range 27 to 65) were tested. A cardiotachometer, a portable respirometer, and a polarographic oxygen sensor were used to make continuous recordings of the heart rates, ventilatory volume, and oxygen consumption before, during, and after climbing. The energy expenditure for the described task ranged from 5 to 11 kcal./min., with an average of 8.4 kcal./min. In terms of caloric energy expenditure and because of rapid return to normal pulse rates, this climbing situation presents only a moderate physical stress.

A66-80688
ANATOMICO-FUNCTIONAL ASPECTS OF THE PHYSIOLOGY OF SLEEP [ASPECTS ANATOMO-FONCTIONNELS DE LA PHYSIOLOGIE DU SOMMEIL].
M. Jouvet, ed. (Fac. de Med., Lab. de Physiol., Lyon, France).
(Centre Natl. de la Rech. Sci., 127e Colloq. Intern., Lyon, Sep. 9–11, 1963).
Paris, Centre National de la Recherche Scientifique, 1965, 357 p. In French and English.

The 127th International Colloquium of the Centre National de la Recherche Scientifique which was held in Lyon, France, Sept. 9–11, 1963, had as its theme the "Anatomico-functional aspects of the physiology of sleep". The reports and papers given are here grouped under five general topics: (1) Neurochemical, humoral, and pharmacological aspects of sleep; (2) Sleep with slow cortical activity; (3) Sleep with rapid cortical activity; (4) Evoked responses during sleep; and (5) Sleep and dreams in man. The five general topics are followed by the report of an extensive general discussion.

A66-80689
BIOCHEMICAL APPROACHES TO THE PROBLEM OF SLEEP [APPROCHES BIOCHIMIQUES AU PROBLEME DU SOMMEIL].
P. Mandel and Y. Godin (Fac. de Med., Ist. de Chim. Biol., Strasbourg, France).
IN: ASPECTS ANATOMO-FONCTIONNELS DE LA PHYSIOL. DU SOMMEIL.. Edited by M. Jouvet.
(Centre Natl. de la Rech. Sci., 127e Colloq. Intern., Lyon, Sep. 9–11, 1963).
Paris, Centre National de la Recherche Scientifique, 1965, p. 13–34; Discussion, p. 34–36. 81 refs. In French.

Brain metabolism during sleep is compared with that during wakefulness and a review is made of biochemical metabolism during sleep. In man, the oxygen consumption of the brain stem is not altered during periods of sleep lasting 10 to 30 minutes, hence the theory of sleep being a state of anoxemia or cerebral ischemia is no longer tenable. The cerebral blood flow is enhanced, possibly due to increased pCO_2; but the overall energy metabolism (in terms of oxygen consumption) remains unchanged, possibly due to a regional distribution of neuronal activity. Similar levels of adenosine triphosphate (ATP), adenosine diphosphate (ADP), and phosphocreatine have been found during sleep and wakefulness, but there is also some evidence for a decrease of ATP and ATP–ADP ratio during sleep. Although the acetylcholine level during sleep has been observed to decrease by 15%, and no significant change has been reported on the repartition of amino acids in the rat brain after three days of sleep deprivation, more evidence is necessary. The possible role of catecholamines in sleep and wakefulness is discussed. A humoral regulation of sleep arising from the brain stem or cortex is postulated, but no definite compound has been implicated.

A66-80690
HUMORAL MECHANISM IN EXPERIMENTAL SLEEP.
Marcel Monnier, Th. Koller, and L. Hösli (Bale, Fac. de Med., Lab. de Physiol., Switzerland).
IN: ASPECTS ANATOMO-FONCTIONNELS DE LA PHYSIOL. DU SOMMEIL.. Edited by M. Jouvet.
(Centre Natl. de la Rech. Sci., 127e Colloq. Intern., Lyon, Sep. 9–11, 1963).
Paris, Centre National de la Recherche Scientifique, 1965, p. 37–48; discussion, p. 48–50. 14 refs.

Neurohumoral sleep transmission was postulated when it was demonstrated that blood serum and cerebrospinal fluid of experimentally fatigued animals contained hypnotoxins which elicited sleep when injected into normal animals. In animals with cross-circulation, however, similar results have not been reproducible. In this experiment, cross-circulation experiments were performed on rabbits to determine whether the electroencephalogram (EEG) sleep-like state induced in a donor animal by thalamic stimulation influenced

tfie electrical brain activity of the recipient animal in the same manner. EEG expression of thalamus-induced sleepiness (increased delta activity) in the donor-animal started after the third and fourth stimulations. The recipient also showed significantly increased delta activity after the fourth stimulation of the donor's thalamus; but decreased delta activities after the fifth and sixth stimulations. The decreased activity suggests a waking reaction related to hemodynamic stress factors in competition with humoral moderating factors.

A66-80691
THE ELECTROENCEPHALOGRAM RELATED TO THE CORTICAL METABOLISM.
David H. Ingvar (Lund. U., Dept. of Neurol., Lab. of Clin. Neurophysiol., Sweden).
IN: ASPECTS ANATOMO-FONCTIONNELS DE LA PHYSIOL. DU SOMMEIL. Edited by M. Jouvet.
(Centre Natl. de la Rech. Sci., 127e Colloq. Intern., Lyon, Sep. 9–11, 1963). Paris, Centre National de la Recherche Scientifique, 1965, p. 53–58; discussion, p. 58–61. 21 refs.

Quantitative measurements of the regional circulation and metabolism of the brain cortex in vivo were carried out by the krypton-85 clearance method for tissue blood flow and related to accompanying electroencephalogram (EEG) changes. The majority of experiments, performed in dogs and cats, revealed that regional cortical oxygen consumption was grossly correlated to EEG pattern, i.e., the more synchronized the EEG pattern, the lower was the regional cortical oxygen uptake. The highest rates were found in aroused preparations with a desynchronized EEG pattern. The krypton-85 clearance method was also adapted to humans and used to determine blood flow in a series of neurological patients. The highest flow values (50–70 ml./100 g. per min.) were obtained in a group of patients with severe EEG abnormalities and a major reduction of consciousness. In an intermediate group, the reduction of blood flow was generally proportional to the abnormality of the EEG.

A66-80692
A CHOLINERGIC HYPNOGENIC LIMBIC FOREBRAIN-HINDBRAIN CIRCUIT.
Raul Hernandez-Peon (Inst. de Invest. Cerebrales, A. C. Moras, Mexico).
IN: ASPECTS ANATOMO-FONCTIONNELS DE LA PHYSIOL. DU SOMMEIL. Edited by M. Jouvet.
(Centre Natl. de la Rech. Sci., 127e Colloq. Intern., Lyon, Sep. 9–11, 1963). Paris, Centre National de la Recherche Scientifique, 1965, p. 63–84; discussion, p. 84–88. 31 refs.

The behavioral and electrographic effects produced by the intracerebral application of minute crystals of various chemical substances were studied in cats with descending cannulae permanently implanted in their brains. Acetylcholine alone, or plus eserine, and carbachol elicited light and deep sleep when applied to any point of a highly circumscribed anatomical pathway termed "sleep system" or "hypnogenic system" extending from the rostral forebrain through the hypothalamus and ventromedial midbrain to the upper medial preoptic nucleus. Local atropinization or electrolytic lesions in caudal segments of the hypnogenic circuit prevented sleep otherwise elicited by cholinergic stimulation of rostral hypnogenic zones. Eserine alone produced the "synchronized" stage of sleep. Low frequency stimulation of the lateral basal forebrain area elicited the two stages of sleep. Local atropinization of the electrically stimulated point produced a state of alertness and prevented the induction of sleep. It is suggested that the limbic forebrain descending part of the sleep system joins in the pons with the ascending bulbopontine influences. If so, the two stages of sleep would be the result of different degrees of activity within the hypnogenic system which in turn inhibit directly the mesodiencephalic vigilance system.

A66-80693
HYPNOGENIC BRAIN STEM MECHANISMS ANTAGONISTIC TO THE RETICULAR ACTIVATING SYSTEM [MECANISMES HYPNOGENES DU TRONG DE L'ENCEPHALE ANTAGONISTES DU SYSTEME RETICULAIRE ACTIVATEUR].
G. Berlucchi, L. Maffei, G. Moruzzi, and P. Strata (C. N. R., Centro di Neurofisiol. e Gruppo d'Elettrofisiol., Pisa; and Pisa U., Ist. di Fisiol., Italy).
IN: ASPECTS ANATOMO-FONCTIONNELS DE LA PHYSIOL. DU SOMMEIL. Edited by M. Jouvet.
(Centre Natl. de la Rech. Sci., 127e Colloq. Intern., Lyon, Sep. 9–11, 1963). Paris, Centre National de la Recherche Scientifique, 1965, p. 89–101; discussion, p. 101–105. 37 refs. In French.
Grant PHS NB-02990-02.

Experiments involving localized cooling of the floor of the fourth ventricle in "encephale isole" cats show that functional inactivation of the bulb has an action opposite to that of the pons. The latter produces, in a reversible fashion, the syndrome of "cerveau isole" and can thus be considered as the expression of a deactivating effect. Cooling of the bulb, on the other hand, is manifested in an activating effect. Control experiments and an analysis of the observations lead to the conclusion that at the level of the bulb the tonic activity of synchronizing centers, antagonistic to the reticular activating system, prevails over the activating effect.

A66-80694
TEMPORARY OR DEFINITIVE ALTERATIONS OF DIENCEPHALIC ZONES IN CAT: THEIR RELATIONSHIP WITH EEG CORTICAL ACTIVITY AND SLEEP [ALTERATIONS TRANSITOIRES OU DEFINITIVES DE ZONES DIENCEPHALIQUES CHEZ LE CHAT. LEURS EFFETS SUR L'ACTIVITE ELECTRIQUE CORTICALE ET LE SOMMEIL].
R. Naquet, M. Denavit, J. Lanoir, and D. Albe-Fessard (C. N. R. S., Centre d'Etude de Physiol. Nerveuse, Paris, and Inst. de Neurophysiol. et de Psychophysiol., Marseille, France).
IN: ASPECTS ANATOMO-FONCTIONNELS DE LA PHYSIOL. DU SOMMEIL. Edited by M. Jouvet.
(Centre Natl. de la Rech. Sci., 127e Colloq. Intern., Lyon, Sep. 9–11, 1963). Paris, Centre National de la Recherche Scientifique, 1965, p. 107–130; discussion, p. 130–131. 25 refs. In French.

In order to determine the respective parts played by the bulbo-mesencephalic, thalamic, and cortical structures in the appearance of slow waves and spindles during sleep, two series of experiments were carried out. In the first series, coagulations and light progressive cooling of various points in the subthalamic region and the posterior hypothalamus were performed by means of a thermode. Within the first ten days following the coagulations, a behavioral and electroencephalographic condition of somnolence was observed, with only rare periods of low fast activity corresponding to arousal behavior. These data confirm previous work which ascribed to the subthalamic region an important part in the control of the arousal reaction. Since both slow waves and spindles were facilitated by cooling and coagulation, a second series of experiments was conducted to dissociate their origin, with these results: (1) The presence of the thalamus seems to be necessary for the production of well organized spindles of normal amplitude, yet a complete conservation of the intralaminary system is not absolutely necessary. (2) The total integrity of the thalamus is not necessary for slow waves which remain after complete thalamectomy or for fast rhythms.

A66-80695
BULBAR CONTROL OF THE AROUSING SYSTEM [CONTROLE BULBAIRE DU SYSTEME ACTIVATEUR].
M. Bonvallet and P. Dell (Hop. Henri-Rousselle, Lab. de Neurophysiol., Paris, France).
IN: ASPECTS ANATOMO-FONCTIONNELS DE LA PHYSIOL. DU SOMMEIL. Edited by M. Jouvet.
(Centre Natl. de la Rech. Sci., 127e Colloq. Intern., Lyon, Sep. 9–11, 1963). Paris, Centre National de la Recherche Scientifique, 1965, p. 133–148; discussion, p. 148–149. 24 refs. In French.

An ascending mechanism which inhibits both tonic and phasically evoked reticular activation has been localized at the bulbar level in "encephale isole" cats and in preparations with the spinal cord transected at T_1, paralyzed with Flaxedil. Discrete coagulations localized in the cephalic pole of the nucleus of the tractus solitarius and in the region between this nucleus and the floor of the fourth ventricle were followed by: (1) the appearance of frequent simultaneous oscillations in cortical, pupilloconstrictor, sympathetic, and muscular tone, corresponding to spontaneous bursts of reticular activation; (2) considerably prolonged responses of all the recorded activities to brief sensory or mesencephalic stimulation; and (3) appearance of oscillations in the recorded activities during the prolonged post-stimulatory periods. The same effects were also observed in chronic preparations coagulated in the critical region 2 to 38 days prior to recording. Coagulations of the caudal ventro-medial part of the bulbar reticular formation did not give similar results. Characteristics of the mechanism of the influence of an ascending tract which prevents spontaneous fluctuations of the reticular tone and limits the duration of reticular responses to sensory stimulation are listed.

A66-80696
SLEEP MECHANISM: HYPOTHALAMIC CONTROL OF CORTICAL ACTIVITY.
Toshihiko Tokizane (Tokyo, U., Inst. of Brain Res., Dept. of Neurophysiol., Japan).
IN: ASPECTS ANATOMO-FONCTIONNELS DE LA PHYSIOL. DU SOMMEIL. Edited by M. Jouvet.
(Centre Natl. de la Rech. Sci., 127e Colloq. Intern., Lyon, Sep. 9–11, 1963). Paris, Centre National de la Recherche Scientifique, 1965, p. 151–184; discussion, p. 184–185. 20 refs.

A series of experiments is reported which were focused on the role of the hypothalamus as ascending activating mechanism for the limbic cortices (hippocampus and amygdala) and the neocortex. The experiments were carried out on cats with chronically or acutely implanted electrodes. It is concluded that the hypothalamus exerts a controlling effect upon the activities of the limbic cortices as well as the cortex, and its effect appears not to involve the midbrain reticular formation. The hypothalamic mechanism may be driven by incoming visceral afferent impulses, or by unknown humoral factors. Changes of the neocortical electroencephalogram (EEG) pattern, of the fast component of the hippocampal EEG pattern, of blood pressure, heart rate, pupil size, galvanic skin potentials, etc. appear to be under the control of the hypothalamus. The absence of somatic responses during certain stages of sleep may be explained as the result of an active inhibitory action on tonically facilitating motor neurons.

A66-80697
NEURONAL ACTIVITY IN VISUAL AND MOTOR CORTEX DURING SLEEP AND WAKING.
Edward V. Evarts (NIH, Natl. Inst. of Mental Health, Lab. of Clin. Sci., Bethesda, Md.).
IN: ASPECTS ANATOMO-FONCTIONNELS DE LA PHYSIOL. DU SOMMEIL. Edited by M. Jouvet.
(Centre Natl. de la Rech. Sci., 127e Colloq. Intern., Lyon, Sep. 9–11, 1963). Paris, Centre National de la Recherche Scientifique, 1965, p. 189–209; discussion, p. 209–212. 22 refs.

The two parts of this report consist of (1) a summary of previously published studies of neuronal activity in the feline visual cortex during sleep and wakefulness, and (2) a description of results of studies on the temporal discharge of pyramidal tract neurons in the motor cortex of the monkey during sleep and waking. The observations suggest that sleep is associated with a reduction both of tonic inhibition of cortical neurons and of inhibitory effects initiated by afferent volleys. The work supports the view of Jasper that cortical activation associated with waking cannot be adequately described in terms of generalized excitation, but it seems to involve a reorganization of temporal and spatial patterns of neuronal discharge—a reorganization in which the role of inhibition is equally as important as the role of excitation.

A66-80698
SHIFTS OF THE CORTICAL STEADY POTENTIAL DURING VARIOUS STAGES OF SLEEP.
H. Caspers (Munster, U., Inst. of Physiol., Germany).
IN: ASPECTS ANATOMO-FONCTIONNELS DE LA PHYSIOL. DU SOMMEIL. Edited by M. Jouvet.
(Centre Natl. de la Rech. Sci., 127e Colloq. Intern., Lyon, Sep. 9–11, 1963). Paris, Centre National de la Recherche Scientifique, 1965, p. 214–224; discussion, p. 225–229. 16 refs.

Previous investigations on freely moving rats with chronically implanted electrodes showed that the steady potential (D.C. component) of the cerebral cortex reflects the actual activity state of an animal more precisely than the conventional electroencephalograph (EEG). The correlation of D.C. shifts and behavior of 102 asleep and awake rats was studied. The present studies confirmed that the transition from wakefulness to sleep is always associated with a positive displacement of the cortical steady potential and with a distinct increase of the direct cortical response. During sleep with high-voltage low-frequency waves, the cortical steady potential remained shifted to the positive side of the mean level in wakefulness (average displacement 0.85 + 0.22 mV). In deep sleep with low-voltage fast EEG activity and strong reduction of muscle tone, the transition from "slow" to "fast" sleep was associated with considerable positive shift in the D.C. records. The positive D.C. deflections contrasted strikingly with the negative shifts during flattening of sleep or with complete arousal, while the EEG tracings were not essentially different.

A66-80699
CHANGES IN BLOOD FLOW OF THE CEREBRAL CORTEX AND OTHER VEGETATIVE CHANGES DURING PARADOXICAL SLEEP PERIODS IN THE UNRESTRAINED CAT.
E. Kanzow (Gottingen, U., Dept. of Physiol., West Germany).
IN: ASPECTS ANATOMO-FONCTIONNELS DE LA PHYSIOL. DU SOMMEIL. Edited by M. Jouvet.
(Centre Natl. de la Rech. Sci., 127e Colloq. Intern., Lyon, Sep. 9–11, 1963). Paris, Centre National de la Recherche Scientifique, 1965, p. 231–237; discussion, p. 238–240. 6 refs.
Deutsche Forschungsgemeinschaft supported research.

The circulation of the cerebral cortex and arterial blood pressure were correlated with electroencephalograph activity and behavior of unrestrained cats during periods of paradoxical sleep. The cortical blood flow increased markedly in the paradoxical sleep periods as a consequence of a vasodilation of the cortical blood vessels. There is no reason to suppose that carbon dioxide tension in the arterial blood was augmented during the paradoxical sleep periods since the respiratory rate and the amplitude of the respiratory movements were increased. Perhaps the vasodilation was due to increased cerebral cortex metabolism, as supported by marked increase of the single unit activity in the occipital cortex.

A66-80700
THE "PARADOXICAL" SLEEP OF THE RABBIT FROM ANATOMO-PHYSIOLOGICAL AND HORMONAL POINT OF VIEW [LE SOMMEIL "PARADOXAL" DU LAPIN DANS SES ASPECTS ANATOMO-FONCTIONNELS ET HORMONAUX].
Jacques Faure (Fac. de Med., Lab. de Neurophysiol., Bordeaux, France).
IN: ASPECTS ANATOMO-FONCTIONNELS DE LA PHYSIOL. DU SOMMEIL. Edited by M. Jouvet.
(Centre Natl. de la Rech. Sci., 127e Colloq. Intern., Lyon, Sep. 9–11, 1963). Paris, Centre National de la Recherche Scientifique, 1965, p. 241–228; discussion, p. 282–283. 51 refs. In French.

The phenomenon of paradoxical sleep was studied in 40 unanesthetized rabbits with implanted electrodes to determine whether such sleep can occur in both sexes, and under which conditions it does occur. Once habituated to their environment, both sexes presented episodes of paradoxical sleep correlated with a fall of arterial blood pressure, an elevated threshold for arousal by noise, and a flat cervical electromyogram with spikes accompanying body jerks. Endogenous luteinizing hormone, liberated by coitus or in relation to exogenous estrogen-progesterone, caused paradoxical sleep with coprophagia; appropriate doses of luteinizing hormone, luteotrophic hormone, human chorionic gonadotrophin, pregnant mare serum, antidiuretic hormone, oxytocin, and oxytocin-isoleucine provoked paradoxical sleep without and sometimes with coprophagia, as often in the male as in the female. Following the dose of testosterone, paradoxical sleep was inhibited or enhanced, depending on the previous state of the animal. In resting animals, weak electric stimulation at very low frequency of encephalic points produced slow wave sleep which was sometimes followed by paradoxical sleep.

A66-80701
OCULAR PHENOMENA DURING SYNCHRONIZED AND DESYNCHRONIZED SLEEP.
G. Berlucchi and P. Strata (Pisa, U., Ist. di Fisiol., Italy).
IN: ASPECTS ANATOMO-FONCTIONNELS DE LA PHYSIOL. DU SOMMEIL. Edited by M. Jouvet.
(Centre Natl. de la Rech. Sci., 127e Colloq. Intern., Lyon, Sep. 9–11, 1963). Paris, Centre National de la Recherche Scientifique, 1965, p. 285–301; discussion, p. 301–307. 49 refs. Rockefeller Found. supported research. Contracts AF 61(5514)-1125 and 61(052)-107; Grants AF EOAR 62-9 and PHS NB-02990-02.

The behavior of pupils and eyelids, visual accommodation, and ocular movements during synchronized and desynchronized sleep are reviewed, and their relationship with the electroencephalogram (EEG) are analyzed. The pupils of cats are completely mydriatic during wakefulness; but they begin to constrict when the animal falls asleep, before the appearance of EEG synchronization. Myotic behavior increases with EEG synchronization up to a complete or almost complete fissurization. At the beginning of desynchronized sleep, the pupils remain fissurated, but rapid and short-lasting pupillary dilations appear synchronously with the phasic ocular movements. The absence of visual accommodation during synchronized sleep is not due to lack of activity of the Edinger–Westphal neurons which innervate the ciliary muscles, since the discharge of these neurons has been observed to increase at the onset of synchronized sleep. Slow, pendular eye movements occur during sleep in both humans and cats when the EEG is synchronized, while rapid eye movements are only present during desynchronized sleep. The closure of the eyelids during sleep is due to the atonia of the m. levator palpebrae superioris and to the active contraction of the m. orbicularis. The mechanism of the eyelids is different in birds, where there is no activity of the m. orbicularis as in mammals.

A66-80702
ASCENDING AND DESCENDING INFLUENCES OF SOMATIC AFFERENT VOLLEYS IN UNRESTRAINED CATS: SUPRASPINAL INHIBITORY CONTROL OF SPINAL REFLEXES DURING NATURAL AND REFLEXLY-INDUCED SLEEP.
O. Pompeiano (C.N.R., Centro di Neurofisiol. e Gruppo d'Elettrofisiol., Pisa and Pisa U., Ist. di Fisiol., Italy).
IN: ASPECTS ANATOMO-FONCTIONNELS DE LA PHYSIOL. DU SOMMEIL. Edited by M. Jouvet.
(Centre Natl. de la Rech. Sci., 127e Colloq. Intern., Lyon, Sep. 9–11, 1963). Paris, Centre National de la Recherche Scientifique, 1965, p. 309–390; discussion, p. 390–395. 185 refs.

Experiments reported in the first part of the review were done to study the influences exerted by somatic afferent volleys on the brain stem structures responsible for the electroencephalographic (EEG) and behavioral manifestations of sleep and wakefulness. In unanesthetized, freely moving cats, low rate stimulation of group II cutaneous fibers induced EEG synchronization; but high rate stimulation of group II cutaneous fibers, as well as low and high rate stimulation of group III fibers, caused EEG and behavioral arousal. In decerebrate, cerebellectomized cats, most of the brain stem units influenced by group II cutaneous fiber stimulation are localized in the medulla and caudal part of the pons. In unrestrained cats, no EEG synchronization was obtained with low rate stimulation of muscular afferents. Graded muscular afferent volleys failed to affect brain stem reticular units in decerebrate cats, both with and without cerebellum. The second part of the review is concerned with the problem of the supraspinal control of the proprioceptive spinal reflexes during natural sleep and during sleep induced by appropriate stimulation of the cutaneous afferents. The last part of the review deals with the problem of the effects of cutaneous nerve stimulation on spinal reflexes.

A66-80703
STUDY OF THE DUALITY OF STATES OF SLEEP AND MECHANISMS OF PARADOXICAL SLEEP ETUDE DE LA DUALITE DES ETATS DE SOMMEIL ET DES MECANISMES DE LA PHASE PARADOXALE .

M. Jouvet (Fac. de Med., Lab. de Med. Exptl., Lyon, France).
IN: ASPECTS ANATOMO-FONCTIONNELS DE LA PHYSIOL. DU SOMMEIL. Edited by M. Jouvet.
(Centre Natl. de la Rech. Sci., 127e Colloq. Intern., Lyon, Sep. 9–11, 1963). Paris, Centre National de la Recherche Scientifique, 1965, p. 397–446; discussion, p. 446–449. 57 refs. In French.

In the first part of the study, the arguments supporting the theory of the duality of sleep into slow sleep (SS) and paradoxical phase (PP) are examined, and it is proposed that the results cannot be explained by a unitary theory of sleep. The second part of the paper outlines some mechanisms of triggering the PP in pontile animals such as by proprioceptive or nociceptive stimulation. The ablation of the hypophysis and hypothalamus does not suppress the occurrence of PP during the first five days of survival. PP deprivation by electric shock involves the reapparenace of the PP with increasing rapidity. PP is shown to be resistant to hypothermia. The facilitatory effect of gamma-butyrolactone is emphasized. It was also found that hyperhydration and dehydration facilitate the PP. All these results are in favor of a self-regulating metabolic process, located at the level of the pons and the hypothetical role of a neuroglial mechanism is considered.

A66-80704
CORTICAL-SUBCORTICAL RELATIONSHIPS OF THE CHIMPANZEE DURING DIFFERENT PHASES OF SLEEP.
J. M. Rhodes, M. R. Reite, Dan Brown, and W. R. Adey (Calif., U., Brain Res. Inst., Los Angeles).
IN: ASPECTS ANATOMO-FONCTIONNELS DE LA PHYSIOL. DU SOMMEIL. Edited by M. Jouvet.
(Centre Natl. de la Rech. Sci., 127e Colloq. Intern., Lyon, Sep. 9–11, 1963). Paris, Centre National de la Recherche Scientifique, 1965, p. 451–472; discussion, p. 472–473. 5 refs.

Sleep in the chimpanzee was studied by means of cortical and subcortical leads of the electroencephalograph (EEG). Changing patterns of amplitude and rhythmicity during light sleep, paradoxical sleep, drowsiness, and wakefulness are reproduced. Some of the conclusions reached are: (1) The chimpanzee has an EEG similar to that of man. (2) There is considerable variability during the initial stages of sleep with the cortex and subcortex showing varying electrical patterns until at least a medium (or spindle) stage of sleep is achieved. (3) Contrary to findings in the cat, the hippocampal-neocortical rhythms are not inversely related. (4) there may well be several stages of paradoxical sleep, with the rhinencephalon having a particularly important role.

A66-80705
SENSORY TRANSMISSION DURING VARIOUS STAGES OF SLEEP AND WAKEFULNESS [VARIATIONS DANS LA TRANSMISSION DES MESSAGES SENSORIELS EN FONCTION DES DIFFERENTS ETATS D'EVEIL ET DE SOMMEIL].
J. Pierre Cordeau, J. Walsh, and H. Mahut (Montreal U., Dept. of Neurol. Sci., Canada).
IN: ASPECTS ANATOMO-FONCTIONNELS DE LA PHYSIOL. DU SOMMEIL. Edited by M. Jouvet.
(Centre Natl. de la Rech. Sci., 127e Colloq. Intern., Lyon, Sep. 9–11, 1963). Paris, Centre National de la Recherche Scientifique, 1965, p. 477–507. 47 refs. In French.

The average amplitudes of positive waves 1 and 4 of cortical evoked responses, recorded from the lateral gyrus of cats following low frequency stimulation of either optic chiasma or optic radiations, were used to indicate the intensity of thalamic transmission at the level of the lateral geniculate nucleus. The average amplitudes of waves 1 and 4 were measured and compared in the same animal during four different behavioral states: wakefulness, arousal, slow wave (light) sleep, and fast wave (deep) sleep. The changes from slow wave sleep to wakefulness, from wakefulness to arousal, and from slow wave sleep to fast wave sleep were accompanied by a facilitation of thalamic transmission at the lateral geniculate level. There was, however, a notable difference in cortical responsiveness (wave 4 of the potential from optic radiations stimulation) between wakefulness as a steady state and waking as a transition from sleep to wakefulness, but during both stages of sleep the cortical responsiveness remained at approximately the same level.

A66-80706
AN EXPERIMENTAL STUDY OF THE CORTICAL REACTIVITY DURING SLEEP AND WAKEFULNESS.
G. F. Rossi, M. Palestini, M. Pisano, and G. Rosadini (Genova, U., Clin. Neurochir., Italy).
IN: Aspects Anatomo-Fonctionnels de la Physiol. Du Sommeil. Edited by M. Jouvet.
(Centre Natl. de la Rech. Sci., 127e Colloq. Intern., Lyon, Sep. 9–11, 1963). Paris, Centre National de la Recherche Scientifique, 1965, p. 509–526; discussion, p. 527–532. 42 refs.
Consiglio Nazl. delle Ric. supported research.
Grant AF EOAR 62-106.

In intact cats with chronically implanted electrodes, electrical potentials were evoked in the visual cortex by single stimuli of the optic radiations and of the lateral geniculate body, and in the sensorimotor cortex by stimulation of the pyramidal tract and of the thalamic nucleus. A comparison was made between the mean amplitude of the responses recorded during wakefulness, light sleep, and deep sleep. The amplitude of the cortical responses evoked by the optic radiations or antidromically by the pyramidal tract was larger during deep sleep than during wakefulness in the great majority of subjects; no significant difference was found between the responses recorded during light sleep and deep sleep. The recovery cycle of the visual cortex was more rapid during sleep than during wakefulness in most cases; it was similar in the two phases of sleep. The amplitude of the cortical responses to thalamic stimulation was larger during deep sleep than during wakefulness, but relatively small during light sleep. The results indicate that the reactivity of the cortical neurons is enhanced during both light sleep and deep sleep. The data suggest that the thalamic reactivity is also larger during deep sleep than during wakefulness, but is depressed during light sleep.

A66-80707
RESPIRATION DURING SLEEP.
Knut Bülow (Lund, U., U. Hosp., Lab. of Clin. Neurophysiol. and Malmo Gen. Hosp., Dept. of Pulmonary Diseases, Lund, Sweden).
IN: Aspects Anatomo-Fonctionnels de la Physiol. Du Sommeil. Edited by M. Jouvet.
(Centre Natl. de la Rech. Sci., 127e Colloq. Intern., Lyon, Sep. 9–11, 1963). Paris, Centre National de la Recherche Scientifique, 1965, p. 535–567, discussion, p. 567–570. 24 refs.

Two main variables in respiration, ventilation and carbon dioxide tension, were recorded continuously with electroencephalogram (EEG) in 70 healthy subjects of both sexes. In each subject, the spontaneous variations in respiration were intimately linked to the level of wakefulness when the EEG pattern varied between wakefulness, drowsiness, and sleep of different depth. It is concluded that there exists a close relationship between the mechanism regulating level of wakefulness and that regulating respiration. In the second part of the study, the part played by carbon dioxide in the respiratory regulation was tested during different levels of wakefulness. Increased carbon dioxide tension of the arterial blood gave a response which decreased with wakefulness. A decrease in wakefulness was accompanied by an increase in the carbon dioxide response threshold as well as a decrease in ventilatory response to carbon dioxide above this threshold. It is hypothesized that the coupling of mechanisms regulating wakefulness and respiration are within the brain stem, and probably within its reticular system.

A66-80708
A PSYCHOLOGIST'S POINT OF VIEW.
K. G. Corkindale (Inst. of Aviation Med., Farnborough, Great Britain).
(Roy. Aeronaut. Soc., All-Day Symp. on Displays, London, Feb. 3, 1965).
Journal of the Royal Aeronautical Society, vol. 69, Oct. 1965, p. 659–662. 17 refs.

The main contribution of psychology to the design of displays up to the present time has been in advising on detailed points of design. Three other areas in which psychology can make a useful contribution are: (a) in stating the basic characteristics of the human operator, particularly the working of the perceptual mechanism, (b) in stating the effect of environmental conditions on performance, and (c) in assessing the information required and in advising on man's role in the system.

A66-80709
THE SIGNIFICANCE OF ATMOSPHERIC ELECTRICITY, ELECTRO-AEROSOL THERAPY, [AND] DIRECT ELECTROSTATIC CHARGE THERAPY ACCORDING TO TAKATA AND ITS BIOLOGICAL EFFECT ON THE AUTONOMOUS NERVOUS SYSTEM WITH REGARD TO THE VEGETONOGRAM [DIE BEDEUTUNG DER LUFTELEKTRIZITAT, DER ELEKTRO-AEROSOLTHERAPIE, DER DIREKTEN ELEKTROSTATISCHEN AUFLADUNGSTHERAPIE NACH TAKATA UND IHRE BIOLOGISCHE WIRKUNG AUF DAS VEGETATIVE NERVENSYSTEM UNTER BERUCKSICHTIGUNG DES VEGETONOGRAMMS].
K. H. Schulz.
Zentralblatt für Biologische Aerosolforschung, vol. 12, Sep. 1965, p. 455–466. 23 refs. In German.

Biological effects of air electricity are discussed. Measurements of air electrical field around Cologne over a three year period confirm the interaction between weather and organism. Cross shifts in the electricity at certain days were accompanied by definite increases in the accident rate. Climatic chamber experiments showed the beneficial effects of both negative and positive charges in various clinical conditions. The patient's autonomic nervous type was of importance. Negatively charged air ions were in most cases more beneficial for the human organism.

A66-80710
EFFECT OF DIFFERENT DIETARY FATS ON OXYGEN CONSUMPTION AND ON SERUM LIPID LEVELS IN THE BABOON (PAPIO URSINUS).

Nerina Savage and B. W. Goldstone (Witwatersrand U., Nutr. and Metab. Res. Group and Dept. of Physiol., Johannesburg, South Africa).
British Journal of Nutrition, vol. 19, 1965, p. 459–467. 26 refs.

Two groups of baboons were studied. One group was given a diet rich in saturated fatty acids and the other group a diet rich in polyunsaturated fatty acids. The cholesterol:phospholipid ratios of both groups of animals increased. The ratio remained elevated in the group receiving the diet high in saturated fat, but eventually reverted to normal in those animals receiving the polyunsaturated-fat diet. For all the observed variables, a polyunsaturated-fat diet closely imitates the action of thyroxine and a saturated-fat diet has the reverse action. In addition, it was noted that these diets had a marked effect on basal oxygen consumption.

A66-80711
THE EFFECT OF THE INTERACTION OF DIETARY PROTEIN AND CALCIUM ON THE GROWTH AND MAINTENANCE OF THE BONES OF YOUNG, ADULT AND AGED RATS.
N. R. H. El-Maraghi, B. S. Platt, and R. J. C. Stewart (Ridgeway, Natl. Inst. for Med. Res., Nutr. Building, Human Nutr. Res. Unit, Mill Hill, London, Great Britain).
British Journal of Nutrition, vol. 19, 1965, p. 491–509. 43 refs.

Young, adult, and aged rats were maintained on diets containing ergocalciferol but having different protein values and Ca concentrations. The size and quality of the bones of the rats were assessed from radiographs, A:R ratios (where A is the weight of the bone ash and R that of the dry, fat-free bone minus the ash), histological examination, total weight of ash, and weight of ash/cm.^{3}. At all the ages tested, the bones of animals receiving diets of low protein value exhibited matrix-osteoporosis. Diets of low (0.11%) Ca content led, when the protein value of the diet was high, to severe mineral-osteoporosis in the bones of young rats, but to only slight changes in those of older animals. Young rats given diets of high protein value had larger bones containing more mineral than litter-mates maintained on a low-protein regimen although both groups received the same amount of food and Ca. When adult rats whose bones had become rarefied on diets of net dietary protein calories % = 1.6 and containing 0.11% Ca were given additional Ca the degree of matrix-osteoporosis increased. On the other hand, improving the protein value of the animals' diets led to a remineralization of their bones. Even in aged rats, matrix-osteoporosis brought about by diets of low protein value could be corrected by increasing the intake of protein. The interaction of protein and Ca and their relative importance in the treatment of osteoporosis is discussed.

A66-80712
ELECTROCARDIOGRAPHIC STUDY AND COURSE OF ARTERIAL PRESSURE IN SUBJECTS SUBJECTED TO VARIOUS BODY POSITIONS BY MEANS OF THE TILTING TABLE [STUDIO ELETTROCARDIOGRAFICO E COMPORTAMENTO DELLA PRESSIONE ARTERIOSA DI SOGGETTI POSTI IN POSIZIONI CORPOREE DIVERSE MEDIANTE TAVOLO INCLINABILE].
E. Busnengo (Centro di Studi e Ric. di Med. Aeron. e Spaziale, Rome, Italy).
(Giornate Med. della Forze Armate, Torino, Jun. 11–12, 1965)
Minerva Medica, vol. 56, Nov. 10, 1965, p. 3797–3798. In Italian.

Using an inclined table, studies were made of the electrocardiogram (EKG) and arterial pressure of three groups of air force pilots (average age 29.6 years). The first group was kept at two body positions: horizontal and with the head elevated to + 65°. The second group assumed three body positions: horizontal, head elevated to + 65°, and head lowered to –65°. EKG changes in orientation of the electrical axis were found in the P wave and QRS complex, indicating that modification imposed on the heart within the thorax depends on respective body positions, such as an axial deviation to the right for the + 65° position and to the left for the –65° position. The T wave showed an axial deviation to the left for all positions. Cardiac frequency was 69 beats/minute in the horizontal position, 92 beats/minute at + 65° and 65 beats/minute at –65°. Arterial pressure was 120/Mx and 80/Mn in the horizontal position, increasing at + 65°, and decreasing at –65°. It is concluded that this test using an inclined table be used for the selection of flight personnel, and during control examinations and training.

A66-80713
ON VARIATIONS OF THE P-WAVE OF THE ELECTROCARDIOGRAM IN RELATION TO CHANGES OF BODY POSITION IN SPACE [SULLE VARIAZIONI DELL'ONDA P DELL'ELETTROCARDIOGRAMMA IN RELAZIONE ALLE VARIAZIONI DI POSIZIONE DEL CORPO NELLO SPAZIO].
C. Vacca, L. Causa, and A. Aurucci (Naples U. degli Studi, Ist. di Fisiol. Umana; and Ist. Med.-legale A. M. "G. Gradenigo", Naples, Italy).
(Giornate Med. delle Forze Armate, Torino, Jun. 11–12, 1965).
Minerva Medica, vol. 56, Nov. 10, 1965, p. 3910–3922. In Italian.

Electrocardiographic tracings were made on 403 subjects, between 19–21 years of age, on an inclined table while changing from the horizontal position to that of + 65° and –65°. Each position was maintained for six minutes. Significant P wave modifications appeared at + 65°, schematically described as (1) increased voltage, with regard to that registered at 0, variable from 1–2 mm.; (2) invariable amplitude; and (3) morphological changes consistent in the fact that the P increase of voltage appeared sharper. In the –65° position EKG variations also appeared. Based on the EKG examinations at + 65° the subjects were placed in the following groups: Group I (19.4%), those with no variation of P and no variation of electrical axis; Group II (31.3%), those with variations of P with variation of electrical axis; Group III (39.7%), those with variations of P without variation of electrical axis; and Group IV (10.9%), those with variation of electrical axis without variation of P. Of the cases examined, 40% modification of the P wave without other variation of the electrical axis represents a significant element from the statistical viewpoint, and indicates that P modifications are related to variations in heart and thorax position.

A66-80714
COURSE OF THE P-WAVE OF THE ELECTROCARDIOGRAM IN RELATION TO CHANGES IN BODY POSITION IN SPACE IN THE RABBIT DEAFFERENTATED IN THE PRESSORECEPTOR ZONE [COMPORTAMENTO DELL'ONDA P DELL'ELETTROCARDIOGRAMMA IN RAPPORTO ALLE VARIAZIONI DI POSIZIONE DEL CORPO NELLO SPAZIO NEL CONIGLIO DEAFFERENTATO DELLE ZONE PRESSOCETTRICI].
C. Vacca, L. Vacca, and A. Aurucci (Naples U. degli Studi, Ist. di Fisiol. Umana; and Ist. di Fisiol. Gen. e Spec. degli animali domestici e Chim. Biol.; and Ist. Med.-legale A. M. "G. Gradenigo", Naples, Italy).
(Giornate Med. delle Forze Armate, Torino, Jun. 11–12, 1965).
Minerva Medica, vol. 56, Nov. 10, 1965, p. 3823–3827. In Italian.

Electrocardiographic tracings were made of rabbits on an inclined table at 0° (horizontal), at + 65°, and at –65°, for one minute in each position, before and after deafferentation of the seno-carotid and cardio-aortic zones and bifurcation of the pulmonary artery. The normal animal in the + 65° position revealed the P wave of the EKG to be sometimes variable with increased voltage and always peaked, whereas at –65°, variations were less evident, the P wave being more ample and of lower voltage. Deafferentation simply abolished the variations observed at + 65° and notably reduced those observed at –65°. It is concluded that stimuli from the pressoreceptor vessel zones, aided by variations of body positions in space which determine variations of blood pressure and blood flow, are responsible for modifications in the morphology and voltage of the P wave.

A66-80715
EXPERIMENTAL INVESTIGATIONS IN ANTIHYPEROXIC PHARMACOPROTECTION [RICERCHE SPERIMENTALI DI FARMACOPROTEZIONE ANTIPEROSSICA].
Giancarlo Moretti and Sergio Fontanesi (Raggruppamento subacquei ed incursori "Teseo Tesei"; and Centro Studi di Med. Navale, Sez. Studi di Fisiopatol. Subacquea, La Spezia, Italy).
(Giornate Med. delle Forze Armate, Torino, Jun. 11–12, 1965).
Minerva Medica, vol. 56, Nov. 10, 1965, p. 3828–3829. In Italian.

Male albino rats were exposed, for periods varying from 30 minutes to one hour, to a pressure of 6 atmospheres in pure oxygen after the intraperitoneal administration of varying doses of cysteine, homocysteine, acetylhomocysteine, glutathione; and surrectan (aminoethylisothiuronium (AET)). In order to evaluate the results the following parameters were used: determination of absolute minimum, maximum, and average preconvulsive time; the immediate and late mortality; the character of motor crises; and the post-decompression course. Animals treated with each drug administered singly showed improvement in preconvulsive time and mortality rate and time as compared with non-treated animals. A significant anticonvulsive activity under hyperoxic conditions was shown by glutathione, cysteine, and surrectan when administered in combination rather than singly. Binary combinations of glutathione-surrectan, -cysteine, -homocysteine, and -acetylhomocysteine, and between surrectan-cysteine, -homocysteine, and -acetylhomocysteine provided limited protection against hyperoxia, although protection was not as good as that given by a combination of glutathione-cysteine-surrectan.

A66-80716
IMPORTANCE AND EVALUATION OF PROVOKED NYSTAGMUS IN SUBJECTS WITH SPONTANEOUS NYSTAGMUS [IMPORTANZA E VALUTAZIONE DEL NISTAGMO PROVOCATO IN SOGGETTI CON NISTAGMO SPONTANEO].
C. Koch (Ist. Med.-Legale per l'Aeron. Mil. "G. Gradenigo", Naples, Italy).
(Giornate Med. delle Forze Armate, Torino, Jun. 11–12, 1965).
Minerva Medica, vol. 56, Nov. 10, 1965, p. 3831–3832. In Italian.

Under vestibular pathological conditions altered stimulation of the oculomotor nuclei on both sides in a dysharmonic fashion leads to abnormal transmission of this stimulus to orbital muscles giving rise to "spontaneous nystagmus". This nystagmus is characterized by loose movement, is directed towards the side of the labyrinth most excited, tends to decrease progressively and in direct relation to the decrease, and is primarily horizontal or horizontal–rotational. By means of rotatory stimulation and electronystagmography spontaneous nystagmus is classified as nystagmus whose peak matches the square formed by the normal visual axis. By studying the intensity, direction, amplitude, stability frequency, form, and rhythm of the electronystagmographic tracings, an exact interpretation of spontaneous

nystagmus is obtained which distinguishes it from fixation, voluntary, latent, optokinetic, and physiological nystagmus. This study could be used to evaluate vestibular function during pilot training, during phases of flight activity, and during periodic control medical examinations. Diagnosis of spontaneous nystagmus is not infrequent and leads to the discovery of labyrinthine or retrolabyrinthine pathology.

A66-80717
CONSIDERATIONS REGARDING EVALUATION OF ACCUSTIC AND VESTIBULAR DAMAGE IN PILOTS AND SPECIALISTS OF THE AIR FORCE [CONSIDERAZIONI SULLA VALUTAZIONE DEI DANNO ACUSTICO E VESTIBOLARE NEI PILOTI E NEGLI SPECIALISTI DELLA AERONAUTICA MILITARE].
C. Koch and P. Castagliuolo (Ist. Med.-Legale per l'Aeron. Mil. "G. Gradenigo", Naples, Italy).
(Giornate Med. delle Forze Armate, Torino, Jun. 11–12, 1965).
Minerva Medica, vol. 56, Nov. 10, 1965, p. 3832–3835. In Italian.

A table is presented for evaluating hearing, which includes losses from 25 to 100 decibels and considers deficiencies up to 8000 Hz. For evaluation of vestibular function the following methods are mentioned: (1) spontaneous reactions such as study of spontaneous nystagmus, tonic asymmetry, Romberg test, and Babinsky–Weil test; and (2) induced reactions such as the rotatory test with nystagmographic registration, and heat test (Viets method). Alterations of the vestibular apparatus are classified as inflammatory labyrinthopathy, tubercular neurolabyrinthitis, neurolabyrinthitis due to infectious diseases (meningitis, parotitis, influenza, etc.), neurolabyrinthitis during the course of nervous disorders (sclerosis, encephalitis, etc.), toxic degenerative labyrinthitis (lead, alcohol, etc.), and atrophic, traumatic, allergic, or hypoxic labyrinthitis. The medico-legal aspects of evaluating the loss of work capacity due to hearing loss or vestibular changes in pilots and flying personnel are discussed.

A66-80718
ON VISUAL PERCEPTION DURING POSTROTATIONAL NYSTAGMUS [SULLA PERCEZIONE VISIVA DURANTE NISTAGMO POST-ROTATORIO].
Giorgio Mazza and Rocco Caporale (Ist. Med.-Legale per l'A.M. "Aldo di Loreto"; and Centro Studi e Ric. di Med. Aeron. e Spaziale, Rome, Italy).
(Giornate Med. delle Forze Armate, Torino, Jun. 11–12, 1965).
Minerva Medica, vol. 56, Nov. 10, 1965, p. 3835–3838. In Italian.

Thirty pilots (both military and airline), 24–48 years of age, with active experience of 3–30 years were subjected to two visual perception tests (perception of horizontal tachistoscopic images) following rotatory stimulation. This stimulation was clockwise or contra-clockwise with accelerations of $1.5^{o}sec.^{-2}$ to constant velocity of $90^{o}sec.^{-1}$ for ten turns following instantaneous deceleration. Electronystagmographic registrations were made for each test. Out of a total of 180 tachistoscopic tests, there occurred 5.5% perception errors during preliminary tests, and 8.8% errors during post-rotatory nystagmus. Average errors of angular evaluation for the first test were 31.8^{o}, and for the second 33.7^{o}; average errors of spatial evaluation were 1.2% for the first test, and 1.1% for the second. The frequency of these errors is not considered significant and it is concluded that the type and intensity of nystagmus used in the experiment does not represent a condition that limits perceptual-visual capacity.

A66-80719
ELECTROENCEPHALOGRAPHIC CONSIDERATIONS REGARDING A GROUP OF PILOTS WITH CONSIDERABLE EXPERIENCE [CONSIDERAZIONI ELETTROENCEFALOGRAFICHE SU UN GRUPPO DI PILOTI DI NOTEVOLE ESPERIENZA].
L. Caputo, T. Boiceff, and R. Virgili (Ist. Med.-Legale A.M. "Aldo Loreto", Rome, Italy).
(Giornate Med. delle Forze Armate, Torino, Jun. 11–12, 1965).
Minerva Medica, vol. 56, Nov. 10, 1965, p. 3846–3848. In Italian.

Electroencephalographic (EEG) tracings were made of 100 pilots, 30–55 years of age, each having 7,000–25,000 hours of flying time. As activation tests during electroencephalography, hyperpnea and intermittent light stimulation were used. The EEG tracings showed the following: 71% had alpha rhythm which was stable, more or less regular, and without significant change during activation; 18% showed a significant desynchronization; and in 11% marked abnormalities appeared during hyperpnea. In comparison, EEG of 100 pilot candidates (average age 39.76 years) revealed that 66% had stable, regular alpha rhythm; 21% had desynchronization; and 13% showed marked abnormalities during hyperpnea. The EEG's of 200 persons not interested in flying (average age 42.08 years) demonstrated that 61% had stable alpha rhythm; 54% had desynchronization; and 4% exhibited abnormalities in hyperpnea. On the basis of the results it is postulated that the tracings obtained from pilots and pilot candidates may be related to the particular personality frequently motivating flying personnel.

A66-80720
USEFULNESS AND LIMITATIONS OF THE NELSON TEST IN LEGAL AVIATION MEDICINE [UTILITA E LIMITI DEL TEST DI NELSON IN MEDICINA LEGALE AERONAUTICA].
S. Castorina and F. Zazo (Ist. Med.-Legale per l'A.M. "A. Mosso", Milan, Italy).
(Giornate Med. delle Forze Armate, Torino, Jun. 11–12, 1965).
Minerva Medica, vol. 56, Nov. 10, 1965, p. 3848–3850. In Italian.

When a case of active syphilis is diagnosed in a pilot, temporary unfitness for flight duty is prescribed. Since such a decision may produce problems in the pilot's economic status and career, positive determination of the existence of active syphylis is necessary. For this reason the Nelson test appears to be more suitable than conventional serological diagnostic tests for syphilis as it utilizes the particular antibodies found only in syphilitic persons to immobilize Treponema pallidum in biological culture. If a seropositive reaction for syphilis is found during routine or special control medical examination of pilots, it is suggested that the Nelson test be used to eliminate any doubt of the diagnosis and to establish whether or not it is a case of active syphilis or a false-positive biological reaction. A negative Nelson test, with exception of the primary period, indicates that the subject is not affected with active syphilis but could have been in a syphilitic state in the past. A positive Nelson test, in subjects with no diagnosed Treponema injections, indicates that the subject is syphilitic or in a syphilitic state. Within these limits the Nelson test is of value in aviation legal medicine.

A66-80721
ON THE USE OF A PREPARATION OF ACETYLASPARTIC ACID AND CITRULLINE IN FLYING SPORT PRACTICE [SULL'IMPIEGO DI UN PREPARATO DI ACIDO ACETILASPARTICO E CITRULLINA NELLA PRATICA SPORTIVA AERONAUTICA].
A. Cicala and G. Ambrosanio (Acad. Aeron. Mil., Rome, Italy).
(Giornate Med. delle Forze Armate, Torino, Jun. 1–12, 1965).
Minerva Medica, vol. 56, Nov. 10, 1965, p. 3850–3853. In Italian.

Sixty athletic subjects, 18–21 years of age, received Ideolider (L-acetyl-aspartic acid and L-citrulline) three times daily for one month. Studies were made of sports activities and of various psychotechnical tests (reaction times to visual and acoustic stimuli, tachistoscopic tests, audiometric tests) before and after Ideolider treatment. Marked improvement was observed in both sports activities and in psychotechnical tests following the use of Ideolider. The drug has a defatiguing and disintoxication action. It is recommended that the drug be used to prevent flight fatigue.

A66-80722
TRAUMATIC LESIONS FROM FLIGHT ACCIDENTS EXAMINED IN THE FORENSIC MEDICAL INSTITUTE "A. MOSSO" IN MILAN FROM 1959 TO 1964, WITH SPECIAL REGARD TO THE SPINAL COLUMN [LESIONI TRAUMATICHE DA INCIDENTI DI VOLO RISCONTRATE PRESSO L'ISTITUTO MEDICO LEGALE "A. MOSSO" DI MILANO DAL 1959 AL 1964 CON PARTICOLARE RIGUARDO ALLA COLONNA VERTEBRALE].
Prospero Italiano (Ist. Med. Legale "A. Mosso", Milan, Italy).
(Giornate Med. delle Forze Armate, Torino, Jun. 11–12, 1965)
Minerva Medica, vol. 56, Nov. 14, 1965, p. 3892–3897. In Italian.

Fifteen cases are reported of spinal cord injury (fractures and arthroses) sustained by Italian civilian and military pilots involved in flight accidents between 1959–1964. The injuries resulted primarily during aircraft crash, landing or violent takeoff, impact, yaw, collision, and from the ejection seat. Complete radiological examination of the spine is necessary to reveal or confirm a clinical diagnosis of the following: lesions of the vertebral body, lesions of the vertebral body associated with lesions of one or more intersomatic discs, multiple vertebral lesions, and post-traumatic deforming arthrosis or spondilodiscoarthrosis.

A66-80723
MAXIMAL RESISTANCE TO ACUTE HYPOXIA IN MICE TREATED WITH DIFFERENT HORMONES [RESISTENZA MASSIMA ALL'IPOSSIA ACUTA IN TOPI TRATTATI CON DIFFERENTI ORMONI].
G. Mazzella and D. Russo (Centro di Studi e Ric. di Med. Aeron. e Spaziale, Rome, Italy).
(Giornate Med. delle Forze Armate, Torino, Jun. 11–12, 1965).
Minerva Medica, vol. 56, Nov. 14, 1965, p. 3916–3918. In Italian.

Five days prior to ascent in a barometric chamber to simulated altitude at 1220 meters/minute, four groups (one control) of mice received subcutaneous injections of either somatotropic hormone (STH), testosterone, or cortisone. The animals were exposed until a maximum lethal altitude for each group was determined. The average lethal altitude for each group of mice was as follows: controls, 9357 m.; STH group, 9957 m.; cortisone group, 10,185 m.; and testosterone group, 10,162 m. The hormone-treated groups exhibited an increased resistance to hypoxia. Hematopoietic behavior (hematocrit, reticulocytes, erythrocytes, leukocytes) was studied in three groups of mice exposed to simulated altitude before and after hormone treatment (STH, testosterone, cortisone). Significant increases were found in the hematopoietic parameters following hormone treatment, indicating that the hormones increased the resistance to altitude.

A66-80724
SOME HEMATOPOIETIC CHANGES IN DIFFERENT SPECIES OF FULLY IRRADIATED ANIMALS COMPARED WITH ANALOGOUS CHANGES IN MAN [ALCUNE VARIAZIONI EMATOPOIETICHE IN DIFFERENTI SPECIE DI ANIMALI PANIRRADIATI COMPARATE CON ANALOGHE VARIAZIONI NELL'UOMO].
G. Mazzella and G. Blundo (Centro di Studi e Ric. di Med. Aeron. e Spaziale, Rome, Italy).
(Giornate Med. delle Forze Armate, Torino, Jun. 11–12, 1965).
Minerva Medica, vol. 56, Nov. 14, 1965, p. 3918–3921. In Italian.

Decreases were found in erythrocytes, leukocytes, reticulocytes, polynucleates (including all types of granulocytes), mononucleates (lymphocytes and complex monocytes), lymphocytes, and in the granulo-erythroblastic ratio of guinea pigs, rats, and mice X-irradiated with variable doses of 360–950 roentgens. Leukocyte damage was evident from the first day of X-irradiation, whereas the effects on the red series appeared after some time. Reticulocytes showed an immediate response to radiation. Data from humans accidentally exposed to high and lethal doses of ionizing radiations demonstrated decreases in leukocytes, and persons subjected to radiation therapy also revealed cellular depression. Graphic comparison is made of hematopoietic changes in animals irradiated with lethal doses of 50 and 100 roentgens and other animal species reported in the literature, including dogs and monkeys.

A66-80725
MEDICAL USE OF THE HELICOPTER AND THE GENEVA CONVENTION [IMPIEGO SANITARIO DELL'ELICOTTERO E CONVENZIONE DI GINEVRA].
G. Pizzigallo (Scuola di Sanita Militare, Florence, Italy).
(Giornate Med. della Forze Armate, Torino, Jun. 11–12, 1965).
Minerva Medica, vol. 56, Nov. 14, 1965, p. 3928–3929. In Italian.

From experiences based on conflicts in Korea, Malaysia, and Algeria, the use of the helicopter Stanag 2087 appears to be the best means for rapid evacuation of wounded from isolated positions. Helicopter evacuation provides rapid transport to hospital and surgical units and adequate in-flight medical aid for wounded. Discussion is presented on article 36 adopted at the first Geneva Conference on August 12, 1949, dealing with the unconditional and permanent protection of helicopters designated for medical use in times of conflict. It is suggested that article 36 be revised to clarify and implement the rules now in use as these helicopters are not sufficiently protected.

A66-80726
PHYSIOLOGICAL ASPECTS OF WALKING WITH PARTIAL SHIFTING OF BODY WEIGHT AND VARIOUS FRICTION WITH THE GROUND [ASPETTI FISIOLOGICI DELLA DEAMBULAZIONE CON PARZIALE ALLEGGERIMENTO DEL PESO CORPOREO E VARIO ATTRITO CON IL SUOLO].
A. Scano and G. Meineri (Centro di Studi e Ric. di Med. Aeron. e Spaziale, Rome, Italy).
(Giornate Med. delle Forze Armate, Torino, Jun. 11–12, 1965).
Minerva Medica, vol. 56, Nov. 14, 1965, p. 3960–3961. In Italian.

Three males (25–37 years of age) were subjected to repeated walking for five minutes at 1g and 0.165 g on a track with maximum friction (rough course), average friction (smooth plastic material), and minimum friction (high layer of talcum powder). The subjects were also exposed to 0.05 g with minimum friction. Increases in pulmonary ventilation and oxygen consumption occurred during walking under subgravity conditions in the three friction states, but the highest increases were found when walking at 0.05 g on the talc surface. Cinematographic registration of foot movements on the talc surface showed uniformity before each test but a considerable sliding of the foot backward with displacement of the talc surface under subgravity conditions. Maximum speed attained with a gravity of 0.16 g on talc surface was 1.89 meters/second, and at 0.05 g 1.05 meters/second. It is concluded that man can move, if supplied with proper means, under conditions of lunar gravity or lower gravity, or on a powdered or sandy surface.

A66-80727
INFLUENCE OF MODERATE ALCOHOLEMIC VALUES ON SOME ASPECTS CONCERNING PSYCHOMOTOR REACTIVITY [INFLUENZA DI MODICI VALORI ALCOOLEMICI SU ALCUNI ASPETTI DELLA REATTIVITA PSICOMOTORIA].
G. Paolucci and L. Balducci (Centro de Studi e Ric. di Med. Aeron. e Spaziale, Rome, Italy).
(Giornate Med. delle Forze Armate, Torino, Jun. 11–12, 1965).
Minerva Medica, vol. 56, Nov. 14, 1965, p. 3961–3963. In Italian.

Two groups of ten normal fasting subjects between 27 and 35 years of age were given two to three small glasses of brandy containing 40% ethyl alcohol. Venous blood alcohol level determined 45 minutes after brandy ingestion was approximately 0.34‰. Prior to ingestion and soon after taking of blood samples the subjects were exposed to the following psychomotor tests: dynamic tremometry (right hand), and bimanual coordination by the first group of subjects, and simple reaction times to visual and acoustic stimuli by the second group. Significant statistical values of the results revealed 1% errors for the tremometry test, 5% errors for bimanual coordination, and 1% average errors for the reaction time test. With regard to flying, on the basis of the results obtained, it is concluded that small quantities of alcohol can be well tolerated by the pilot and do not impede the performance of normal flight activities.

A66-80728
A CASE OF RETINAL DETACHMENT INCURRED DURING FLIGHT [UN CASO DI DISTACCO RETINICO INSORTO IN VOLO].
C. Terrana and R. Neuschuler (Rome U., Clin. Oculistica; and Ist. Med. Legale dell' A.M. "Aldo Di Loreto", Rome, Italy).
(Giornate Med. delle Forze Armate, Torino, Jun. 11–12, 1965).
Minerva Medica, vol. 56, Nov. 14, 1965, p. 3963–3964. In Italian.

A case history is reported of retinal detachment in a 26-year-old military pilot which occurred during repeated and rough acrobatic flight maneuvers. Since intense acrobatic flight activity was performed by the pilot a week prior to the occurrence of retinal detachment, repeated accelerative forces contributed substantially to the etiology. Treatment consisted of diathermy with a normal post-operative course.

A66-80729
INVESTIGATIONS CONCERNING CORONARY CIRCULATION AND HEART METABOLISM DURING INCREASING HYPOXEMIA [UNTERSUCHUNGEN ZUR KORONARDURCHBLUTUNG UND ZUM HERZSTOFFWECHSEL BEI ANSTEIGENDER HYPOXAMIE].
J. Szegi and M. Haase (Deutsche Akad. für Experti. Chirurgie des Herzens und des Gefäss-Systems, East Berlin, Germany).
Das deutsche Gesundheitswesen, vol. 20, Dec. 30, 1965, p. 2303–2305. 15 refs. In German.

Experiments were conducted with 20 mongrel dogs on the effect of progressive hypoxemia to the point of cardiac arrest on the coronary circulation, and on the oxygen, glucose, and lactic acid consumption by the heart muscle. Three phases, characterized by different rates of consumption of lactic acid, were differentiated.

A66-80730
THE SIGNIFICANCE OF SPORT- AND PERFORMANCE-MEDICAL FINDINGS AND OF EXAMINATION METHODS FOR MILITARY TRAINING OF TODAY [DIE BEDEUTUNG SPORT- UND LEISTUNGSMEDIZINISCHER ERKENNTNISSE UND UNTERSUCHUNGSMETHODEN FUR DIE HEUTIGE MILITARISCHE AUSBILDUNG].
E. J. Klaus (Münster U., Inst. für Sportmed., West Germany).
(Wehrmed. Ges., Arbeitstagung, Münster/W., Jul. 14, 1965).
Wehrmedizinische Monatsschrift, vol. 9, Dec. 1965, p. 232–234. 20 refs. In German.

Contributions of sports medicine and aviation medicine to advances in evaluation of physical fitness are reviewed. Two of the recently developed test batteries are described. One method consists of hematocrit, urinalysis, X-rays of heart size, ergospirographic measurement of maximum oxygen uptake, blood pressure, and electrocardiogram under graded stress with determination of oxygen pulse and cardiac efficiency quotient. The other method is an abbreviated version which includes X-rays of heart size, blood count and urinalysis, and electrocardiogram and blood pressure registration during graded ergometric exercise.

A66-80731
LIFE-SHORTENING IN MICE EXPOSED TO RADIATION: EFFECTS OF AGE AND OF HYPOXIA.
Patricia J. Lindop and J. Rotblat (St. Bartholomew's Hosp. Med. Coll., London, Great Britain).
Nature, vol. 208, Dec. 11, 1965, p. 1070–1072. 8 refs.
British Empire Cancer Campaign for Research and NIH supported research.

Experiments investigating the effects of age at irradiation and of hypoxia on life shortening are reported. Mice of five age groups (1 day, 1 week, 4 weeks, 8 weeks, 30 weeks) were exposed to six dose levels of X-rays while breathing either air, nitrogen, or oxygen. Hypoxia was found to reduce the life shortening effect of radiation. However, there are marked differences in this protective action of hypoxia between the older and younger age groups. For the 8- and 30-week groups, the life shortening, although small, is proportional to the dose. The life shortening per 100 rad is 1.3 and 0.5 week for the two age groups, respectively. A comparison with the life shortening effect produced by the same age groups exposed to 425 rad while breathing air shows that nitrogen reduced the effect by a factor of about 3. However, for two younger age groups, 1 day and 1 week, exposure under hypoxic conditions appears to change the dose response relationship from linear to non-linear. Several explanations for these results are attempted.

A66-80732
INTERACTIONS OF OXYGEN AT HIGH PRESSURE AND RADIATION IN DROSOPHILA.
J. J. Thomas, Jr., R. C. Baxter, and W. O. Fenn (Rochester U., Med. Center, Depts. of Physiol. and Radiation Biol., N. Y.)
Journal of General Physiology, vol. 49, Jan. 1966, p. 537–549. 15 refs.
Contracts Nonr 441:SK:ka, NR102-630, and 668-11 (NR 102-281).

Oxygen at high pressure (OHP) and X-irradiation can interact in the fruit fly Drosophila melanogaster to potentiate toxic actions characteristic of one agent alone. X-irradiation in doses of 30, 60, and 75 kr. accelerated the acute immobilization of young male Drosophila by oxygen at 7.8 atm., up to rates twice that observed with such oxygen pressure alone. X-irradiation alone in these dosages did not acutely immobilize the Drosophila. X-irradiation during exposure to 7.8 atm. pO_2 was more effective and consistent in producing this potentiation than was X-irradiation that preceded exposure to OHP. Acute OHP toxicity in young female Drosophila was not potentiated by 75 kr. of X-irradiation. On the other hand, shortening of the life span of young male Drosophila by the above doses of X-irradiation was augmented significantly by a concurrent 40 min. exposure to OHP (which alone did not significantly decrease life span). This shows, for the first time, that oxygen can affect not only the acute effects of radiation, but also the residual irreversible effects indicated by the life span shortening.

A66-80733
CIRCADIAN CYCLE OF URINARY CORTISOL IN HEALTHY SUBJECTS AND IN CUSHING'S SYNDROME.
A. I. Vagnucci, M. E. Hesser, G. P. Kozak, G. L. Pauk, D. P. Lauler, and G. W. Thorn (Peter Bent Brigham Hosp., Dept. of Med., and Harvard Med. School, Boston, Mass.)
Journal of Clinical Endocrinology and Metabolism, vol. 25, Oct. 1965, p. 1331–1339. 26 refs.
Grants PHS 8-MO1-FR-31-05, AM 00019-15 and AM 5100-09.

The diurnal variation of unconjugated urinary cortisol (Hydrocortisone, U.S.P.) was measured in 12 healthy subjects and in 3 patients with Cushing's syndrome secondary to adrenal hyperplasia. A sensitive double isotope dilution assay allowed the quantitation of cortisol in 5 ml. urine aliquots with satisfactory precision and accuracy. A circadian variation was present in the normal subjects with peaks in the early or late morning hours and minima in the late evening hours; this rhythm is consistent with the known diurnal changes of plasma cortisol. A cycle was also present in 3 patients with Cushing's syndrome secondary to adrenal hyperplasia; its deviations from the normal pattern are pointed out.

A66-80734
MANIFESTATIONS OF PSYCHIC CHARACTERISTICS IN A VIGILANCE TASK.
Ol'ga Halmiova (Slovak Acad. of Sci., Inst. of Exptl. Psychol., Bratislava, Czechoslovakia).
Studia Psychologica, vol. 7, 1965, p. 258–270. 10 refs.

This study investigated the influence of "weak" versus "strong" central nervous system (Teplov, B. M., 1962) on vigilance performance. A modified Landolt ring was used as stimulus in a 50-min. vigilance task. The experimental group (pronounced strong and pronounced weak C.N.S. types) was selected on the basis of a standardized psychobiographical method. In the second part of the experiment, middle C.N.S. types also participated. Results were evaluated along three parameters: total performance (number of signals presented), number of signals detected, and number of false positive detections. The "strong" C.N.S. group differed along all parameters from the "weak" group, with the middle group approaching the weak C.N.S. type. Vigilance performance is discussed for diagnosis of neurophysiological types and in personnel selection.

A66-80735
EXTRACTS OF CHLORELLA CELLS AS A GROWTH FACTOR OF TETRAHYMENA PYRIFORMIS, STRAIN W.
Masao Okuda, Yoshiro Takechi, Shiro Nishida (Nara Educ. and Liberal Arts U., Japan), and Hideo Takada (Osaka City U., Fac. of Sci., Lab. of Plant Physiol., Osaka City, Japan).
Physiology and Ecology, vol. 13, Jun. 1965, p. 43–48. 5 refs. In Japanese.

To determine the growth factor in extracts of Chlorella cells (CGF), cultures of Tetrahymena pyriformis were grown axenically at 25° C. in medium supplemented with extract at different concentrations. Growth determinations were made on mass cultures at 6th day after inoculation; and total dry weight, total cell volume, and cell number were measured. The effect of CGF in stimulating the growth of T. pyriformis over controls grown in peptone only or with minerals and vitamin mixture, may be partly due to its content of unknown substance. Supraoptimal concentrations of CGF suppressed all growth processes; dry weight, cell volume, and cell number declined. The promotion of growth by CGF was accomplished chiefly by increased cell number rather than by enlargement of cell size. Many problems regarding the mechanism of CGF in increased growth of T. pyriformis remain to be investigated. However, the present investigations have conclusively confirmed that the growth of T. pyriformis appears to be unequally effective between CGF and yeast extract. Possible differences in this respect are still to be discovered.

A66-80736
ECOLOGICAL AND SEASONAL VARIATIONS OF SKIN TEMPERATURE IN MAN [EKOLOGICHESKIE I SEZONNYE IZMENENIIA TEMPERATURY KOZHI U CHELOVEKA].
P. A. Zolotov (S. M. Kirov, Med. Inst., Gorki, USSR).
Fiziologicheskii Zhurnal SSSR, vol. 51, Nov. 1965, p. 1343–1350. 37 refs.
In Russian

Human skin temperature is correlated with the ambient temperature, but this relationship is affected by seasonal variations and local climate. Skin temperatures of the extremities show greater variations than other areas of the body. Studies show that around Chita, in central Siberia, skin temperatures of men inside dwellings are higher by 2–3.5° C. than readings of persons living in central areas of European Russia. The reason for such difference may be the difference in air humidity.

A66-80737
CHANGES IN WORKING CAPACITY OF MUSCLE AFTER EXPOSURE OF MAN TO HYPOKINETIC CONDITIONS [IZMENENIE MYSHECHNOI RABOTOSPOSOBNOSTI POSLE PREBYVANIIA CHELOVEKA V USLOVIIAKH GIPOKINEZII].
N. I. Taranov and N. E. Panferova.
Fiziologicheskii Zhurnal SSSR, vol. 51, Nov. 1965, p. 1351–1355. 5 refs.
In Russian.

Studies on human subjects showed that muscular potentials, as registered by the electromyogram, decrease when muscles remain in a state of inactivity for a considerable period of time. Limited activity after a period of inactivity increases the potential readings. These findings may be important in considering the deterioration of motor function during space flight when men are immobilized for a long period of time in their seats.

A66-80738
DETERMINATION OF THE THRESHOLD EXCITABILITY OF SEMICIRCULAR CANALS WITH THERMAL STIMULATION METHOD [OPREDELENIE POROGA VOZBUDIMOSTI POLUKRUZHNYKH KANALOV SPOSOBOM TEMPERATURNOI STIMULIATSII].
R. S. Bogdanov and I. V. Orlov (USSR, Acad. of Sci., I. P. Pavlov Inst. of Physiol., Leningrad).
Fiziologicheskii Zhurnal SSSR, vol. 51, Nov. 1965, p. 1370–1372. In Russian.

A method is described for a caloric test for determining the threshold of excitation of the semicircular canals in pigeons. It utilizes a small device with a nicrome wire loop attached to the semicircular canal.

A66-80739
SHIELDING OF ASTRONAUTS FROM ELECTRONS AND BREMSSTRAHLUNG IN THE EARTH RADIATION BELTS [ZASHCHITA KOSMONAVTA OT ELEKTRONOV I TORMOZNOGO IZLUCHENIIA V RADIATSIONNOM POLASE ZEMLI].
E. E. Kovalev, D. P. Osanov, G. B. Radzievskii, and A. D. Mel'nik.
Kosmicheskie Issledovantia, vol. 3, Sep.–Oct. 1965, p. 782–789. 16 refs.
In Russian.

Mathematical considerations are presented for the protection of astronauts from ionizing radiation produced by free electrons and bremsstrahlung in the radiation belts surrounding the earth. The types of protection possible during extravehicular maneuvers are considered. Experimental data are used in studying the distribution of electrons in light-atomic materials. Tissue doses due to bremsstrahlung, caused by the impact of electrons on shielding, are evaluated.

A66-80740
RADIOBIOLOGICAL EFFECTS IN ANIMALS SUBJECTED TO ACCELERATION STRESS [RADIOBIOLOGICHESKIE EFFEKTY U ZHIVOTNYKH POSLE PREDVARITEL'NOGO VOZDEISTVIIA USKORENIIA].
B. I. Davydov, V. V. Antipov, N. I. Konnova, and P. P. Saksonov.
Kosmicheskie Issledovantia, vol. 3, Sep.–Oct. 1965, p. 789–795. 14 refs.
In Russian.

Simultaneous exposure of mice to acceleration and radiation showed that LD 50/30 was greater by 100 r than during irradiation alone. The average life-span of animals exposed to 250 r combined with acceleration was decreased. The coefficients of weight variations of spleen and thymus of animals subjected to acceleration before irradiation were higher 3–15 days after the experiment. Leucopenia was noted. Possible mechanisms of the effect of acceleration during radiation exposure are discussed.

A66-80741
EFFECT OF SPACE FLIGHT FACTORS ON THE GENETIC SYSTEM OF MAMMALS [VLIIANIE NEKOTORYKH FAKTOROV KOSMICHESKOGO POLETA NA NASLEDSTVENNYE STRUKTURY MLEKOPITAIUSHCHIKH].
M. A. Arsen'eva, L. A. Beliaeva, IU. S. Demin, G. L. Pokrovskaia, A. V. Golovkina, and I. I. Gavrilina.
Kosmicheskie Issledovaniia, vol. 3, Sep.–Oct. 1965, p. 796–807. 8 refs. In Russian.

In mice subjected to 35–70 c.p.s. vibration for a period from 15 min. to 4 hr., the frequency of chromosomal adhesions and recombinations was increased during metaphase in bone marrow and spleen tissues. Acceleration of 8 g for 5–15 min. also resulted in more frequent chromosomal adhesions and fragmentation in bone marrow cells. Subjecting animals to vibration and acceleration prior to irradiation by X-rays and fast neutrons modified the radiation effect; the frequency of chromosomal recombination was decreased in brain tissue and sexual cells after 30 min. to 2 days. By exposure to vibration after irradiation, this effect was delayed.

A66-80742
SPACE AND INTELLIGENT BEINGS [KOSMOS I RAZUMNYE SUSHCHESTVA].
F. A. Tsitsin (P. K. Shternberg State Inst. of Astronomy, Moscow, USSR).
Priroda, no. 11, Nov. 1965, p. 94–101. In Russian.

The physical factors are considered which control the state of the visible universe, primarily, temperature, presence of atmosphere enveloping a planet and existing force of gravity on a planet. These factors are important in the formation of macromolecules from which life can evolve. Assumption that only one out of 10^5–10^6 stars can provide the center of a system similar to the solar system, creating planetary conditions suitable for supporting life, is, according to the author, an underestimation. Some mathematical considerations indicate a greater probability of the existence of extraterrestrial life.

A66-80743
OXYGEN TENSION IN THE BRAIN TISSUE OF RATS UNDER THE EFFECT OF TRANSVERSELY DIRECTED ACCELERATIONS [NAPRUZHENNIA KYSNIU V TKANYNI MOZKU BILYKH SHCHURIV PID VPLYVOM POPERECHNO SPRIAMOVANYKH PRYSKOREN].
I. F. Sokolianskyi (Ukrainian Acad. of Sci., O. O. Bohomolits Inst. of Physiol., Kiev, UkrSSR).
Fiziolohichnyi Zhurnal, vol. 12, Nov.–Dec. 1965, p. 743–747. 27 refs. In Ukrainian.

In white rats, 2 g transverse acceleration caused a depression of respiration and a lowering of brain tissue oxygen tension by 17.2%. The functional activity of the organisms, however, was increased. Acceleration of 30–40 g caused a considerable disturbance in respiratory function. The brain tissue oxygen tension fell by 26.2–32.4%. The organism tolerance, therefore, must depend on the degree of the developed hypoxia.

A66-80744
EFFECT OF HIGH-FREQUENCY PHYSICAL AGENTS ON ABSORPTION OF RADIOACTIVE PHOSPHORUS IN THE INTESTINE [VPLYV VYSOKOCHASTOTNYKH FIZYCHNYKH AHENTIV NA VSMOKTUVANNIA RADIOAKTYVNOHO FOSFORU V KYSHECHNYKU].
V. R. Faitelberh-Blank (Ukrainian Res. Inst. for Resort and Physiotherapy, Dept. of Physiotherapy, Odessa, UkrSSR).
Fiziolohichnyi Zhurnal, vol. 12, Nov.–Dec. 1965, p. 802–807. 12 refs. In Ukrainian.

Absorption of radioactive bi-substituted phosphate salt in the intestine in the normal state and under the influence of superhigh-frequency (SHF) and ultrasonic vibrations was studied on six dogs with isolated intestinal loops by Thiry's method. The effect of SHF of 70 and 120 watts acting on the organism for 10 minutes and of ultrasonic vibrations of 0.5 and 1.5 w./cm.^{2} for 5 minutes on the resorption of radioactive phosphorus in the intestine was investigated. It was found that SHF of 70 w. and ultrasonic vibrations of 0.5 w./cm.^{2} raise resorption of radioactive salt in the intestine. SHF of 120 w. and ultrasonic vibrations of 1.5 w./cm.^{2} lower resorption of radioactive phosphorus. The author explains the results by involvement of the nervous system in the mechanism of the effect of the investigating agents on the processes of radioactive salt absorption in the intestines.

A66-80745
USE OF METHODS OF CORRELATION ANALYSIS FOR THE STUDY OF HUMAN CARDIOVASCULAR SYSTEM RESPONSES DURING FLIGHT OF SPACECRAFT "VOSKHOD" [PRIMENENIE METODOV KORRELIATSIONNOGO ANALIZA DLIA IZUCHENIIA REAKTSII SERDECHNO-SOSUDISTOI SISTEMY CHELOVEKA V KOSMICHESKOM POLETE NA KORABLE "VOSKHOD"].
A. D. Voskresenskii and M. D. Venttsel'.
Kosmicheskie Issledovaniia, vol. 3, Nov.–Dec. 1965, p. 927–934. 16 refs. In Russian

The method of autocorrelation and intercorrelation of cardiovascular data registered by telemetry during the space flight Voskhod on all three astronauts produced the following results: (1) The function of autocorrelation of A-T and R-R approached a cosinusoid curve. (2) In one astronaut during the 14th orbit the pulse rate was the same as before lift-off, but the R-R curve showed waves of 12–16 cycles. (3) During sleep or rest no slow waves were noted in the Q-T curve. (4) During orbital flight no slow components were noted in Q-T intervals at any value of R-R. (5) The origin of slow periodic oscillations may be connected with emotional stress, therefore the absence of such oscillation during space flight indicated that weightlessness has no effect on heart action.

A66-80746
STUDY OF KIDNEY FUNCTION IN PERSONNEL OF SPACECRAFT "VOSKHOD" [ISSLEDOVANIE FUNKTSII POCHEK U EKIPAZHA KOSMICHESKOGO KORABLIA "VOSKHOD"].
IU. B. Natochin, M. M. Sokolova, V. F. Vasil'eva, and I. S. Balakhovskii.
Kosmicheskie Issledovaniia, vol. 3, Nov.–Dec. 1965, p. 935–939. 8 refs. In Russian.

Clinical laboratory studies of kidney elimination functions of the astronauts after the "Voskhod" mission disclosed a disturbance in the ability to eliminate ingested water at the normal rate. Normalization occurred 18 days after the misston. The normal daily elimination of 17-oxycorticosteroids, potassium, and sodium indicated no damage to the kidney tissue. It must be assumed, therefore, that water retention was due to changes in the endocrine regulatory system, with a tendency to conserve water during space flight.

A66-80747
UNCERTAINTY, IMPORTANCE, AND AROUSAL AS DETERMINANTS OF PRE-DECISIONAL INFORMATION SEARCH.
C. K. Hawkins (V. A. Hosp., Perry Point, Md.) and J. T. Lanzetta (Dartmouth Coll., Hanover, N. H.)
Psychological Reports, vol. 17, Dec. 1965, p. 791–800. 13 refs.
Contract AF 49(638)-1441 and Grant NSF GS-311.

Berlyne's conflict theory of "epistemic curiosity" (1962) assumes information search to be elicited by arousal resulting from response conflict, which in turn is a function of the uncertainty and "importance" of a choice. Several predictions derived from this formulation were tested using a choice task in which uncertainty (number of alternatives) and importance (value of outcomes) were manipulated and subject's galvanic skin response was recorded. Results showed that (a) Neither variable influenced arousal. (b) Increasing the uncertainty component of conflict increased search; increasing importance suppressed it. (c) Arousal did not increase before a search response, but subjects whose general arousal levels were high searched more.

Subject Index

AEROSPACE MEDICINE AND BIOLOGY / *a continuing bibliography* MAY 1966

Listing of Subject Headings of Reports

A Notation of Content, rather than the title of the document, appears under each subject heading; it is listed under several headings to provide multiple access to the subject content. The accession number is located beneath and to the right of the Notation of Content, e.g., N66-12345. Under any one subject heading, the accession numbers are arranged in sequence.

A

ABSORPTION
EFFECT OF HIGH-FREQUENCY VIBRATIONS ON ABSORPTION OF RADIOACTIVE PHOSPHORUS IN INTESTINE, IN DOGS
A66-80744

ABSTRACT
SOVIET ABSTRACTS ON PROBLEMS OF SPACE BIOLOGY
N66-16933

ORGANIC SYSTEMS AND BIOGENESIS - ABSTRACTS
NASA-TT-F-9863 N66-18448

ACCELERATION STRESS
EXPERIMENTS WITH ANESTHESIZED DOGS SUBJECTED TO G ACCELERATIONS, OBSERVING BEHAVIOR OF ARTERIAL OXYGEN SATURATION AND PULMONARY VENTILATION DURING SHORT PERIODS A66-19083

PHYSIOLOGICAL REACTIONS OF HUMAN BODY TO TRANSVERSE ACCELERATION AND MEANS OF INCREASING RESISTANCE A66-80560

INTERACTION OF LINEAR AND ANGULAR ACCELERATIONS ON VESTIBULAR RECEPTORS IN MAN A66-80564

COMBINED EFFECT OF ACCELERATION AND RADIATION ON PHYSIOLOGICAL FUNCTION IN MICE A66-80740

EFFECTS OF VIBRATION, ACCELERATION AND IRRADIATION ON CHROMOSOMES IN MICE A66-80741

OXYGEN TENSION CHANGES IN BRAIN TISSUE OF RATS SUBJECTED TO TRANSVERSE ACCELERATION
A66-80743

ACCELERATION TOLERANCE
NEUROLOGIC ADAPTATIONS AND AUDIOGENIC RESPONSES IN MICE EXPOSED TO CHRONIC 2 X GRAVITY FIELD, NOTING DEVELOPMENT OF MORE EFFICIENT CIRCULATORY SYSTEM, GROWTH PATTERN ALTERATIONS, ETC
A66-17660

ACCIDENT PREVENTION
TWO YEARS OPERATIONAL EXPERIENCE OF TITAN II ICBM MEDICAL SUPPORT PERSONNEL IN PREVENTING ACCIDENTS FROM OPERATIONAL HAZARDS A66-80567

ACCLIMATIZATION
PHYSIOLOGY OF CHRONIC ADAPTATION TO HIGH ELEVATIONS - ACCLIMIZATION
JPRS-33871 N66-16325

ACOUSTIC SIMULATION
BASIC PRINCIPLES OF STIMULATED ELECTROAUDITORY PERCEPTION N66-16819

ACTIVITY /BIOL/
DEMONSTRATION AND VARIATION OF CIRCADIAN RHYTHM OF ACTIVITY IN SINGLE NEURON OF SEA HARE
A66-80548

NEURONAL ACTIVITY IN VISUAL AND MOTOR CORTEX DURING SLEEP AND WAKING IN MAMMALS
A66-80697

ADAPTATION
EFFECTS OF ADAPTATION OF MICE TO COLD ON REPRODUCTION AND GROWTH A66-80521

REVIEW OF STUDIES INVESTIGATING POSSIBLIITY THAT MAN IN HOT CLIMATE MAY ADAPT TO WATER DEPRIVATION
A66-80686

PHYSIOLOGY OF CHRONIC ADAPTATION TO HIGH ELEVATIONS - ACCLIMIZATION
JPRS-33871 N66-16325

RESPONSE LATENCY CHANGES FOLLOWING SIGNAL PITCH SHIFTS, AND ADAPTATION-LEVEL THEORY EVALUATION
TR-36 N66-16510

HUMAN BODY ADAPTIVE REACTION TO INCREASED AIR PRESSURE BASED ON HIGHER NERVOUS SYSTEM STUDY
N66-17152

ADIPOSE TISSUE
EFFECT OF STARVATION AND PROLONGED EXERCISE ON FATTY ACID COMPOSITION IN ADIPOSE TISSUE AND EFFECT OF ADRENALIN ON COMPOSITION OF FATTY ACIDS RELEASED BY ADIPOSE TISSUE IN VITRO IN RATS
A66-80651

ADRENAL GLAND
INFLUENCE OF POSTURE AND DIURNAL RHYTHM ON RENAL EXCRETION OF ACID IN NORMAL MEN AND ADRENALECTOMIZED PATIENTS A66-80632

ROLE OF PITUITARY AND ADRENAL GLANDS IN GENESIS OF AND RECOVERY FROM RADIATION PATHOLOGICAL SYMPTOMS
JPRS-34120 N66-17623

ADRENAL METABOLISM
VARIATIONS OF RESISTANCE AND RESPONSIVENESS AND CIRCADIAN ADRENAL CYCLE IN NORMAL SUBJECTS AND PATIENTS A66-80535

RELATIVE EFFECT OF HYPOXIA AND HYPERCAPNIA ON ADRENAL MEDULLARY SECRETION IN ANESTHETIZED DOGS
A66-80640

ADSORPTION
ADSORPTION CHANGES IN NERVOUS SYSTEM AND INTERNAL ORGANS OF MICE DURING OXYGEN-INDUCED CONVULSIONS
N66-17144

AEROSOL
CASCADE VAULT SAMPLER FOR BACTERIAL AEROSOLS
A66-19087

AEROSPACE MEDICINE
MORPHOLOGICAL CHARACTERISTICS AND FUNCTIONAL DATA IN PILOT TRAINEES, NOTING ANTHROPOMETRIC DATA AND VITAL CAPACITY, OXYGEN INTAKE, HEART RATE, ETC
A66-19084

PSYCHOLOGICAL AND PHYSIOLOGICAL TESTING IN SUCCESS

PREDICTION IN FLIGHT TRAINING PROGRAMS
NASA-CR-69895 N66-16192

IMMUNOLOGIC PROBLEMS OF SPACE BIOLOGY AND MEDICINE
JPRS-33922 N66-16324

SOVIET ABSTRACTS ON PROBLEMS OF SPACE BIOLOGY N66-16933

RESEARCH IN EXOBIOLOGY, ENVIRONMENTAL BIOLOGY, BEHAVIORAL BIOLOGY, MOLECULAR BIOLOGY AND BIOINSTRUMENTATION, SPACE FLIGHT PROGRAMS, AND MANNED SPACE FLIGHT
NASA-SP-92 N66-17778

AEROSPACE MEDICINE AND BIOLOGY - CONTINUING BIBLIOGRAPHY WITH ABSTRACTS
NASA-SP-7011/21/ N66-17886

AGE FACTOR
AGE DEPENDENCE OF RESISTANCE OF CHICKENS TO 100 PERCENT OXYGEN AT ONE ATM / OAP/, NOTING DELAYED MORTALITY IN ADULT BIRDS A66-17458

BLOOD, PLASMA, AND RED CELL VOLUMES OF YOUNG AND OLD MEN DURING REST AND EXERCISE IN DESERT ENVIRONMENT AND AT HIGH ALTITUDE A66-80606

INTERACTION OF DIETARY PROTEIN AND CALCIUM ON GROWTH AND MAINTENANCE OF BONES OF YOUNG, ADULT, AND AGED RATS A66-80711

LIFE SHORTENING IN MICE EXPOSED TO X-RAY IRRADIATION IN RELATION TO AGE AND HYPOXIA A66-80731

EVALUATION OF INTERNAL RADIATION DOSES - EFFECTIVE ENERGY OF ABSORBED RADIONUCLIDES AS FUNCTION OF HUMAN AGE
CEA-R-2809 N66-16222

AGING
AGING EFFECT ON INTELLIGENCE TEST SCORES A66-80584

HEAT, FOOD INTAKE, AND AGING EFFECTS ON THYROID FUNCTION OF MALE RATS A66-80619

BIOMEDICAL SURVEY OF AIR TRAFFIC CONTROL FACILITIES - RELATIONSHIP OF EXPERIENCE AND AGING TO INCIDENCE OF STRESS SYMPTOMS
AM-65-6 N66-16669

CORTICAL BONE VOLUME AND LUMBAR SPINE DENSITY RELATED TO AGING IN WOMEN - X-RAY MEASUREMENTS OF RELATIVE VERTEBRAL DENSITY N66-17669

MINERAL CONTENT OF BONE CORTEX RELATED TO THICKNESS IN SECOND METACARPAL AS A FUNCTION OF AGE AND SEX N66-17673

ASH CONCENTRATION, FEMORAL THICKNESS, AND VERTEBRAL MINERALIZATION RELATED TO AGING IN HUMANS N66-17680

AGRICULTURE
ALGAE GROWTH EXPERIMENTS AND APPLICATIONS - SPACE FLIGHT NUTRITION, FOOD, AND AGRICULTURE
JPRS-34012 N66-16499

AIR SAMPLING
CASCADE VAULT SAMPLER FOR BACTERIAL AEROSOLS A66-19087

EQUIPMENT AND PROCEDURE DESCRIPTION FOR AIR SAMPLING BETA RADIATION FALLOUT MEASUREMENTS
RB-65-1 N66-16997

AIR TRAFFIC CONTROL
AIR TRAFFIC CONTROL INCIDENT REPORTING SYSTEM DESIGN TO MAXIMIZE CORRECTIVE FEEDBACK
AM-65-10 N66-16583

SELF-REPORTED SYMPTOM INCIDENCE OF AIR TRAFFIC CONTROL PERSONNEL
AM-65-5 N66-16584

BIOMEDICAL SURVEY OF AIR TRAFFIC CONTROL FACILITIES - RELATIONSHIP OF EXPERIENCE AND AGING TO INCIDENCE OF STRESS SYMPTOMS
AM-65-6 N66-16669

AIRCRAFT ACCIDENT
MARINE PILOT TRAINING TO DEVELOP VISUAL HABIT PATTERNS AS AID IN REDUCING MID-AIR COLLISION HAZARDS A66-17712

AIRCRAFT ACCIDENTS AND DISORIENTATION EXPERIENCES OF ARMY HELICOPTER PILOTS AS RELATED TO TRAINING AND INSTRUMENT DESIGN A66-80563

SEAT BELT INJURIES IN AIRCRAFT ACCIDENTS - CASE HISTORIES FOR EVIDENCE OF SYNDROME A66-80633

VERTEBRAL COLUMN INJURY DURING AIRCRAFT ACCIDENTS - CASE HISTORY A66-80722

AIRCRAFT LANDING
POWERED TRIM CHANGES AFFECTING PILOT DURING SIMULATED LANDING FOR SHORT TAKE OFF AND LANDING AIRCRAFT
NASA-TN-D-3246 N66-16550

AIRCRAFT PERFORMANCE
POWERED TRIM CHANGES AFFECTING PILOT DURING SIMULATED LANDING FOR SHORT TAKE OFF AND LANDING AIRCRAFT
NASA-TN-D-3246 N66-16550

AIRCREW
TREE-TOP ALTITUDE NAVIGATION FOR RECONNAISSANCE MISSION - ROLE OF AIRCRAFT TYPE, MISSION LENGTH, ILLUMINATION, WEATHER, AND CREW EXPERIENCE N66-16532

AIRFLOW
RELATIONSHIP OF AIR FLOW TO ESOPHAGEAL PRESSURE DURING MAXIMAL RESPIRATORY EFFORT IN MAN A66-80596

ALBUMIN
PHYSICAL AND CHEMICAL PROPERTIES OF ALPHA-LACTALBUMIN CRYSTALS PREPARED FROM GOAT MILK N66-16363

ALGAE
MOLECULAR ASPECTS OF CIRCADIAN SYSTEMS IN MITOSIS AND PHOTOSYNTHESIS IN MICROORGANISMS A66-80531

BIOCHEMICAL FACTORS IN PHOTOSYNTHESIS RHYTHM IN ALGAE, GONYAULAX POLYEDRA A66-80532

ROLE OF NUCLEUS IN CYTOPLASMIC DIURNAL RHYTHM OF GREEN ALGAE OXYGEN PRODUCTION A66-80533

EFFECTS OF LIGHT INTENSITY AND CULTURE DENSITY ON ALGAL OXYGEN PRODUCTION
NRL-6331 N66-16214

MATHEMATICAL DESCRIPTION OF CONTINUOUS CULTURING OF MICROALGAE
JPRS-33831 N66-16315

ALGAE GROWTH EXPERIMENTS AND APPLICATIONS - SPACE FLIGHT NUTRITION, FOOD, AND AGRICULTURE
JPRS-34012 N66-16499

ALLERGY
VARIATIONS OF RESISTANCE AND RESPONSIVENESS AND CIRCADIAN ADRENAL CYCLE IN NORMAL SUBJECTS AND PATIENTS A66-80535

ALTITUDE
MECHANICAL AND CHEMICAL VENTILATORY STIMULUS INTERACTION AT LOW AND HIGH ALTITUDES IN MAN. A66-80589

ALTITUDE ACCLIMATIZATION
RENAL CHANGES ASSOCIATED WITH ACCLIMATIZATION TO HIGH ALTITUDE IN RATS A66-80553

CARDIAC OUTPUT IN MAN AT REST AND AT WORK DURING AND AFTER ACCLIMATIZATION TO 3,800 METERS A66-80608

EFFECT OF ADRENALECTOMY ON ADAPTATION TO HYPOXIA IN RATS - CHANGES IN HAEMOGLOBIN CONCENTRATION AND OSMOTIC RESISTANCE OF ERYTHROCYTES IN PERIPHERAL BLOOD A66-80652

ALTITUDE SIMULATION
RESISTANCE OF MYOCARDIUM TO ANOXIA IN RATS ACCLIMATIZED TO HIGH ALTITUDE SIMULATION A66-80649

PHOSPHORYLATION OF FRUCTOSE IN RAT SKELETAL MUSCLES AND LIVER TISSUES DURING HYPOXIA AT SIMULATED ALTITUDE A66-80656

MAXIMAL RESISTANCE DURING ALTITUDE SIMULATION TO ACUTE HYPOXIA IN MICE TREATED WITH CORTISONE, TESTOSTERONE, AND SOMATOTROPIC HORMONE A66-80723

AMINO ACID
THERAPEUTIC USE OF ACETYLASPARTIC ACID-CITRULLINE PREPARATION IN FLIGHT FATIGUE DURING SPORT FLYING A66-80721

OPTICAL PROPERTIES OF AMINO ACIDS USING MASS SPECTROMETRY AND GAS CHROMATOGRAPHY
AFOSR-65-1632 N66-16516

CATALYTIC ACTIVITY AND CHEMICAL PROPERTIES OF POLY-ALPHA-AMINO ACIDS AND POLYNUCLEOTIDES
NASA-CR-70384 N66-17273

VITAMIN CONTENT, NUTRITIONAL VALUE, AND AMINO ACID COMPOSITION OF EGG WHITE AFTER LONG TERM STORAGE AT ROOM TEMPERATURE
R-2089 N66-18072

ANATOMY
ANATOMY OF CENTRE MEDIAN NUCLEUS OF LUYS
NASA-TM-X-56159 N66-18369

ANESTHESIOLOGY
PRACTICAL AND PHYSIOLOGICAL ASPECTS OF GIVING ANESTHESIA AT HIGH ALTITUDES A66-80510

ANGULAR ACCELERATION
INTERACTIONS BETWEEN OPTOKINETIC AND VESTIBULO-OCULAR RESPONSES DURING HEAD ROTATION IN VARIOUS PLANES A66-80568

ANGULAR VELOCITY
UNAIDED VISUAL DETECTION OF TARGET SATELLITE FOR RENDEZVOUS PURPOSES, DISCUSSING INTENSITY AND ANGULAR VELOCITY IN STAR FIELD A66-18815

ANIMAL STUDY
INFANTILE TREADMILL EXPERIENCE EFFECT ON BODY WEIGHT AND RESISTANCE TO EXHAUSTION IN RAT A66-17460

RATS EXPOSED TO SPACE CABIN ATMOSPHERE FOR TWO WEEKS, NOTING MORTALITY RATE, ORGANISM FUNCTIONING, GROWTH RATE, ETC A66-17663

ZERO-GRAVITY EFFECT ON OPOSSUM FETUS OBSERVED BY TV SYSTEM IN PROPOSED SATELLITE A66-18726

CYTOPLASMIC ALTERATIONS AND FAT VACUOLE FORMATION IN PNEUMOCYTES OF GUINEA PIGS EXPOSED TO SEVERE HYPOXIA IN LOW PRESSURE CHAMBER A66-18769

EXPERIMENTS WITH ANESTHESIZED DOGS SUBJECTED TO G ACCELERATIONS, OBSERVING BEHAVIOR OF ARTERIAL OXYGEN SATURATION AND PULMONARY VENTILATION DURING SHORT PERIODS A66-19083

EXPERIMENTS WITH RATS UNDER ANESTHESIA SUBJECTED TO ACCELERATION, NOTING ELECTROENCEPHALOGRAMS A66-19085

IONIZING RADIATION EFFECTS IN MICE PROTECTED WITH HYPOXIA OR WITH CHEMICALS A66-19086

ACUTE INHALATION TOXICITY OF OXYGEN DIFLUORIDE IN ALBINO RAT A66-19723

INHALATION TOXICITY AT AMBIENT AND REDUCED PRESSURES IN MONKEYS, DOGS AND RODENTS UPON EXPOSURE TO OZONE, NITROGEN DIOXIDE AND CARBON TETRACHLORIDE A66-19724

SUMMARIES OF RESEARCH AND PRESENT KNOWLEDGE OF BIOLOGICAL RHYTHMS IN PLANTS AND ANIMALS A66-80514

COSMIC RADIATION HAZARDS AND EFFECT ON MAN AND ANIMALS IN RELATION TO SOLAR ACTIVITY AND FLIGHT DURATION A66-80519

OVERT CIRCADIAN FREQUENCIES AND CIRCADIAN RULE A66-80525

RESPONSE CURVES IN CIRCADIAN PERIODICITY - SYNCHRONIZATION AND PHASE SHIFT IN ANIMALS AND PLANTS A66-80526

CELL DIVISION RHYTHM AND CIRCADIAN CLOCK IN PLANTS AND ANIMALS A66-80529

EFFECT OF TEMPERATURE VARIATIONS ON BIOLOGICAL CLOCKS IN PLANTS AND ANIMALS A66-80530

ROLE OF ENDOCRINE AND CENTRAL NERVOUS SYSTEMS IN VARIOUS BIOLOGICAL RHYTHMS IN INSECTS, CRUSTACEANS AND VERTEBRATES CONCERNING METABOLISM A66-80534

UNIFIED THEORY FOR BIOLOGICAL RHYTHMS - ENVIRONMENTAL PERIODICITIES AS TIMERS ON PLANT AND ANIMAL RHYTHMS A66-80537

PHASE-ANGLE DIFFERENCE IN CIRCADIAN PERIODICITY OF ORGANISM AND ENVIRONMENTAL PERIODICITY A66-80538

CLOCK MECHANISMS IN CELESTIAL ORIENTATION OF ANIMALS A66-80549

TRANSDUCER FOR RECORDING INSTANTANEOUS RESPIRATORY WAVEFORMS IN ANIMALS AND MAN A66-80624

PERFORMANCE OF EXPOSURE SYSTEM FOR SMALL ANIMALS AT ATMOSPHERIC AND REDUCED PRESSURES A66-80625

EFFECT OF PURE OXYGEN BREATHING ON IMMATURE RETINAL VESSELS IN MAN AND EXPERIMENTAL ANIMALS A66-80642

ROLE OF HIGHER NERVOUS SYSTEM IN MECHANISM OF INTERACTION OF RESPIRATORY AND VASOMOTOR CENTERS DURING DEVELOPMENT OF HEMIC HYPOXIA AND FUNCTIONAL RESTORATION A66-80658

PROTECTION FROM IONIZING RADIATION UNDER HYPOXIC CONDITIONS IN PLANTS AND ANIMALS A66-80682

STUDY OF MECHANISMS OF DUALITY OF SLEEP A66-80703

HEMATOPOIETIC CHANGES IN DIFFERENT ANIMALS AFTER X-IRRADIATION AS COMPARED WITH ANALOGOUS CHANGES IN MAN A66-80724

PHYSICAL AND CHEMICAL PROPERTIES OF ALPHA-LACTALBUMIN CRYSTALS PREPARED FROM GOAT MILK N66-16363

BEHAVIOR REFLEX REGULATION OF DECORTICATE CAT, NEURAL MECHANISMS RESPONSIBLE FOR DEEP SLEEP, AND REFLEXES IN CIRCULATION REGULATION DURING SLEEP
AFOSR-65-1579 N66-16469

HYPERBARIC OXYGEN EFFECT ON MICRORGANISMS IN VITRO AND IN LIVE MICE GIVEN INFECTIOUS INJECTIONS N66-16955

FROG RESPIRATORY SYSTEM CILIARY MUCOUS TRANSPORT DECREMENT IN CLOSED CONTROLLED SUBMARINE CABIN ATMOSPHERE - ANIMAL STUDY
REPT.-443 N66-16990

HOMOGRAFT RESPONSE AND HEMAGGLUTININ PRODUCTION BY SENSITIZED THYMECTOMIZED IRRADIATED ADULT MICE
USNRDL-TR-920 N66-17065

PHYSIOLOGICAL RESPONSES IN HUMANS AND ANIMALS TO AIR EMBOLISMS AND PRESSURE ENVIRONMENTS IN DECOMPRESSION SICKNESS STUDIES
NASA-TT-F-358 N66-17126

SUPERSATURATION OF ANIMALS AND HUMANS WITH GASES FOR DECOMPRESSION SICKNESS STUDIES
N66-17129

ANIMAL STUDIES ON SUPERSATURATION WITH NITROGEN AND INCREASED BODY RESISTANCE TO DECOMPRESSION SICKNESS N66-17131

DECOMPRESSION SICKNESS PROVOCATION BY EXPOSING ANIMALS TO HIGH ALTITUDE PRESSURE AFTER DECOMPRESSION N66-17132

DECOMPRESSION AIR EMBOLIC PROCESS IN ANIMALS AND PHYSIOLOGICAL RESPONSES N66-17133

PHYSIOLOGICAL RESPONSES IN RABBITS TO ARTIFICIAL EMBOLISM DUE TO INJECTIONS OF CARBON DIOXIDE, OXYGEN, AIR, AND HELIUM-OXYGEN MIXTURE
N66-17134

INCREASED TOLERANCE TO AIR EMBOLISM IN ANIMALS BY REPEATED INJECTIONS N66-17135

ARTIFICIAL AIR EMBOLISM AND DECOMPRESSION EFFECTS ON BLOOD OF DOGS N66-17136

TEMPERATURE EFFECTS ON DECOMPRESSION SICKNESS AND AIR EMBOLISM IN ANIMALS N66-17137

CIRCULATORY AND RESPIRATORY REACTIONS IN DOGS TO DECOMPRESSION AND ARTIFICIAL AIR EMBOLISM
N66-17138

RESPIRATORY AND CIRCULATORY CHANGES IN DOGS DURING HIGH PRESSURE OXYGEN TOXICITY N66-17140

PATHOLOGICAL CHARACTERISTICS AND MECHANISM OF PULMONARY INVOLVEMENT IN HIGH PRESSURE OXYGEN TOXICITY IN GUINEA PIGS AND DOGS
N66-17141

HEART ACTIVITY DURING HIGH PRESSURE OXYGEN TOXICITY IN DOGS AND GUINEA PIGS
N66-17142

CIRCULATING BLOOD VOLUME CHANGES IN DOGS BREATHING OXYGEN UNDER PRESSURE N66-17143

ADSORPTION CHANGES IN NERVOUS SYSTEM AND INTERNAL ORGANS OF MICE DURING OXYGEN-INDUCED CONVULSIONS
N66-17144

LONG TERM HEMODYNAMIC CHANGES IN DOGS UNDER HIGH PARTIAL PRESSURE OF OXYGEN N66-17146

HYPEROXEMIC AND HYPOXEMIC CONVULSION EFFECTS ON SUGAR, LACTIC ACID, AND INORGANIC PHOSPHORUS LEVELS IN DOG BLOOD AND SPINAL FLUID
N66-17147

HIGHER NERVOUS ACTIVITY CHANGES IN STIMULUS RESPONSE FOR DOGS UNDER RAREFIED AIR AND ANOXIC CONDITIONS N66-17148

CONDITIONED RESPONSE BEHAVIOR OF DOGS UNDER ACUTE HYPOXIA N66-17149

DINITROPHENOL-INDUCED HYPERTHERMIA UNDER ALTERED PARTIAL PRESSURES OF OXYGEN AND CARBON DIOXIDE
N66-17150

INCREASED CARBON DIOXIDE CONTENT EFFECT ON ANIMAL BREATHING IN GAS PRESSURE CHAMBER
N66-17151

PULMONARY PRESSURE TRAUMA MECHANISM DURING AIR AND OXYGEN BREATHING N66-17153

EFFECT OF OXYGEN BREATHING IN RESORPTION OF GAS EMBOLISM IN VASCULAR SYSTEM OF CATS AND ON COURSE OF PULMONARY PRESSURE TRAUMA
N66-17154

VESTIBULAR SENSITIVITY AND ASSOCIATED LOCOMOTOR RESPONSES OF RATS IN ROTATING ENVIRONMENT
NASA-CR-70394 N66-17271

BONE MINERAL CONTENT IN DOMESTIC HEN MEASURED BY ATTENUATION OF MONOENERGETIC PHOTON BEAM
N66-17675

PHYSIOLOGICAL RESPONSE OF GERM CELLS IN FLOWER BEETLES, TRIBOLIUM CASTANEUM, TO X-RAY IRRADIATION
HW-SA-3747 N66-17833

IONIZING RADIATION EFFECT ON SUBMICROSCOPIC STRUCTURES OF IRRADIATED FROGS AND RESULTING ALTERATIONS IN METABOLIC FUNCTIONS
COO-1080-1 N66-17943

PERCUTANEOUS TOXICITY IN ANIMALS AND RELATED INDUSTRIAL HAZARDS IN RARE EARTH PROCESSING
TID-22294 N66-17950

VIBRATING MIRROR FLYING SPOT ULTRAVIOLET MICROSCOPE WITH INCORPORATED TELEVISION SYSTEM - ULTRAVIOLET RADIATION EFFECTS ON CELL STRUCTURE AND BEHAVIOR
TID-21611 N66-17985

REGENERATIVE PROCESSES AND ORGANIC CHANGES IN ANIMALS FOLLOWING SHOCK WAVES
DVL-481 N66-18131

RELATIONS BETWEEN LACTATE PRODUCTION, RESPIRATION, AND NUCLEAR DAMAGE IN IRRADIATED RAT THYMOCYTES
EUR-2623.E N66-18146

BIOLOGICAL RADIATION EXPOSURE STUDIES - LARGE PARTICLE INHALATION IN DOGS, INTRAGASTRIC AND SKIN EXPOSURE IN PIGS, INGESTED PARTICLES IN RATS, AND PLUTONIUM 28 INGESTION RATS
NASA-CR-70520 N66-18157

DELAYED SEA URCHIN EGG MITOSIS BY HIGH MAGNETIC FIELD - TESTING METHODS FOR MAGNETIC FIELD-FREE ENVIRONMENT
NASA-CR-70632 N66-18318

EXPERIMENT TO DETERMINE CHICKEN REACTION TO 100 PERCENT OXYGEN AT ATMOSPHERIC PRESSURE
NASA-CR-60380 N66-18391

ANNUAL VARIATION
BASIC PATTERNS AND VARIATIONS IN ELECTROCARDIOGRAPHIC RECORDS OF 37 SUBJECTS DURING NORMAL ACTIVITY OVER FOUR YEAR PERIOD
A66-80627

ANOXIA
PROTECTIVE EFFECT OF HYPERBARIC OXYGENATION IN CEREBRAL ANOXIA IN DOGS A66-80556

RESISTANCE OF MYOCARDIUM TO ANOXIA IN RATS ACCLIMATIZED TO HIGH ALTITUDE SIMULATION
A66-80649

EFFECT OF DURATION OF ANOXIA, FREQUENCY OF STIMULATION, AND TEMPERATURE ON CONTRACTIBILITY OF MYOCARDIUM DAMAGED BY ANOXIA IN RATS
A66-80650

HIGHER NERVOUS ACTIVITY CHANGES IN STIMULUS RESPONSE FOR DOGS UNDER RAREFIED AIR AND ANOXIC CONDITIONS N66-17148

ANTHROPOMETRY
MORPHOLOGICAL CHARACTERISTICS AND FUNCTIONAL DATA IN PILOT TRAINEES, NOTING ANTHROPOMETRIC DATA AND VITAL CAPACITY, OXYGEN INTAKE, HEART RATE, ETC
A66-19084

BODY MEASUREMENTS OF PILOTS MADE DURING ANTHROPOMETRIC SURVEY - APPLICATIONS TO EQUIPMENT DESIGN N66-16534

ANTICHOLINERGICS
EFFECT OF ACETYLCHOLINE, ESERINE, ATROPINE, AND CARBACHOL ON SLEEP INDUCTION PATH IN BRAIN IN CATS
A66-80692

ANTIRADIATION DRUG
BIOLOGICAL HAZARDS OF RADIATIONS IN SPACE AND CHEMICAL PROTECTION AND METHODS OF TREATMENT A66-80520

ANXIETY
PULMONARY DIFFUSING CAPACITY AND CARDIOVASCULAR RESPONSE IN MAN AS AFFECTED BY APPREHENSION A66-80602

APNEA
POSTHYPERVENTILATION APNEA IN AWAKE MAN A66-80591

APOLLO PROJECT
ASTRONAUT SELECTION AND CREW PREPARATION PROCEDURES FOR GEMINI AND APOLLO PROGRAMS A66-18578

ARCTIC
AMELIORATIVE VALUE OF CARBOHYDRATE AND ELECTROLYTES TO SURVIVAL OF FASTING HUMAN SUBJECTS IN ARCTIC A66-80613

AROUSAL
THALAMIC TRANSMISSION DURING SLEEP AND WAKEFULNESS IN CATS A66-80705

UNCERTAINTY, IMPORTANCE, AND AROUSAL AS DETERMINANTS OF PRE-DECISIONAL INFORMATION SEARCH A66-80747

ASTHMA
VARIATIONS OF RESISTANCE AND RESPONSIVENESS AND CIRCADIAN ADRENAL CYCLE IN NORMAL SUBJECTS AND PATIENTS A66-80535

ASTRONAUT
RADIATION EXPOSURE OF ASTRONAUTS DURING LUNAR MISSIONS A66-80683

SHIELDING OF ASTRONAUTS FROM ELECTRONS AND BREMSSTRAHLUNG IN EARTH RADIATION BELTS A66-80739

USE OF METHODS OF CORRELATION ANALYSIS FOR STUDY OF TELEMETRIC DATA OF CARDIOVASCULAR SYSTEM RESPONSES DURING FLIGHT OF VOSKHOD I SPACECRAFT A66-80745

STUDY OF KIDNEY FUNCTION IN PERSONNEL OF SPACECRAFT **VOSKHOD** AFTER SPACE MISSION A66-80746

ASTRONAUT PERFORMANCE
HUMAN PERFORMANCE CAPABILITIES IN SPACE BASED ON LABORATORY AND SPACEFLIGHT RESEARCH A66-18581

HUMAN ADJUSTMENT TO SHIFT IN DAY-NIGHT CYCLE AND EFFECT OF SPACE FLIGHT ON SLEEP AND ACTIVITY CYCLES OF ASTRONAUTS A66-18582

ASTRONAUT TRAINING
SYSTEM COSTS AND PHARMACOLOGICAL TECHNIQUES AS FUNCTION OF EXERCISE PROGRAM DESIGNED TO MAINTAIN SPACE CREW PHYSICAL FITNESS A66-17658

ASTRONAUT SELECTION AND CREW PREPARATION PROCEDURES FOR GEMINI AND APOLLO PROGRAMS A66-18578

TRAINING AND SELECTION PROCEDURES USED AT USAF AEROSPACE RESEARCH PILOT SCHOOL A66-18579

ATMOSPHERIC CONDUCTIVITY
THERMOREGULATION IN MICE AND HELIUM-OXYGEN ATMOSPHERE CONDUCTIVITY A66-80681

ATMOSPHERIC IONIZATION
BIOLOGICAL EFFECT OF AIR ELECTRICITY IN STATISTICAL BIOMETEOROLOGY, CLIMATIC CHAMBER EXPERIMENTS, AND THERAPY A66-80709

ATMOSPHERIC PRESSURE
EXPERIMENT TO DETERMINE CHICKEN REACTION TO 100 PERCENT OXYGEN AT ATMOSPHERIC PRESSURE NASA-CR-60380 N66-18391

ATTITUDE INDICATOR
CONTROL ANALOG VERTICAL ATTITUDE INDICATOR AND VTOL FLIGHT DISPLAY FOR HELICOPTER PILOT TRAINING N66-16536

AUDITORY PERCEPTION
PITCH DISCRIMINATION AT HIGH FREQUENCIES BY AIR AND BONE CONDUCTION A66-80663

EFFECTS OF STREPTOMYCIN SULFATE IN TREATMENT OF ENDOLYMPHATIC HYDROPS - MENIERES DISEASE NASA-CR-69862 N66-16446

GENERAL MODEL OF SPEECH DISCRIMINATION USED TO REFORMULATE MOTOR THEORY OF PERCEPTION JPRS-34106 N66-16954

AUDITORY SENSATION AREA
BASIC PRINCIPLES OF STIMULATED ELECTROAUDITORY PERCEPTION N66-16819

AUDITORY SIGNAL
PERCEPTUAL REFERENCE FRAME EVALUATION, AND PHYSIOLOGICAL RESPONSES TO UNUSUAL ENVIRONMENTS, AUDITORY SIGNALS, STRUCTURELESS VISUAL FIELD EXPOSURE, AND STIMULI AD-623869 N66-16506

RESPONSE LATENCY CHANGES FOLLOWING SIGNAL PITCH SHIFTS, AND ADAPTATION-LEVEL THEORY EVALUATION TR-36 N66-16510

AUDITORY STIMULUS
ELECTROCUTANEOUS SIGNALS USED WITH AUDITORY AND VISUAL STIMULI TO PROVIDE ALERTING AND WARNING SIGNS FOR RECEPTION OF MILITARY INFORMATION N66-16529

AUTOMATIC CONTROL
COMPUTER PROGRAM TO SIMULATE SECOND ORDER SERVO SYSTEM DYNAMICS UNDER AUTOMATIC AND MANUAL CONTROL NASA-CR-70340 N66-17082

AUTOMATION
HEURISTIC PROGRAMMING, CYBERNETICS AND PSYCHOLOGY OF REASONING, AND AUTOMATION OF HUMAN INTELLECT JPRS-34182 N66-18051

AUTOMATON
STOCHASTIC AUTOMATIC MODELS FOR SYNTHESIS OF LEARNING SYSTEMS TR-EE65-17 N66-17615

AUTONOMIC NERVOUS SYSTEM
ROLE OF SYMPATHETIC NERVOUS SYSTEM IN CIRCULATORY RESPONSE TO ARTERIAL HYPOXIA IN RABBITS A66-80643

BIOLOGICAL EFFECT OF AIR ELECTRICITY IN STATISTICAL BIOMETEOROLOGY, CLIMATIC CHAMBER EXPERIMENTS, AND THERAPY A66-80709

PERIPHERAL AUTONOMIC NERVOUS SYSTEM INDICES VALIDITY STUDY FOR PREDICTING INDIVIDUAL ADJUSTMENT RESPONSE TO ENVIRONMENTAL STRESS AD-624783 N66-16991

AUTORADIOGRAPHY
REPORTS FROM U.S.S.R. ACADEMY OF MEDICAL SCIENCES ON CORTICOSTEROIDS, STEROID HORMONES, DIABETES, THYROID GLAND AND PANCREAS DISEASES, AUTORADIOGRAPHY, AND ELECTROCARDIOGRAPHY JPRS-33643 N66-16244

AUTORADIOGRAPHIC METHOD USED FOR STUDIES OF GRANULOCYTOPOIESIS IN MAN BNL-7955 N66-18287

B

BACILLUS
BACILLUS SPORE GERMINATION IN SIMULATED MARTIAN ENVIRONMENT NASA-CR-70524 N66-18088

BACKGROUND EFFECT
USAF WHOLE BODY GAMMA SPECTROMETRY IN SUPPORT OF AIR FORCE AEROSPACE MISSION A66-17664

BACTERIA
CASCADE VAULT SAMPLER FOR BACTERIAL AEROSOLS
A66-19087

BALLISTOCARDIOGRAM
CONSTRAINT PLATFORM AND BIOTELEMETRY MODULE FOR HUMAN BALLISTOCARDIOGRAM AND ELECTROCARDIOGRAM IN ZERO GRAVITY ENVIRONMENT
NASA-CR-69828 N66-16283

BARORECEPTOR
CIRCULATORY EFFECTS OF CAROTID ARTERY STRETCH RECEPTORS STIMULATION IN MAN AT REST AND DURING EXERCISE A66-80555

COURSE OF P-WAVE IN RELATION TO BODY POSITION IN RABBIT - PRESSORECEPTOR EFFECT A66-80714

BED REST
ORTHOSTATIC TOLERANCE AS AFFECTED BY WATER IMMERSION AND BED REST WITH OR WITHOUT PHYSICAL ACTIVITY A66-80558

CALCIUM METABOLISM AND BONE MASS CHANGES RESULTING FROM CONTINUOUS PERIODS OF BED REST
N66-17683

REGRESSION CURVES COMPUTED FROM URINARY CALCIUM EXCRETION AND BONE MASS DATA OBTAINED FROM MEN IN BED REST AND AMBULATORY STUDIES
N66-17684

BEHAVIOR
CORRELATION OF ELECTROENCEPHALOGRAM WITH PUPIL AND EYELID BEHAVIOR, VISUAL ACCOMMODATION, AND OCULAR MOVEMENTS DURING SLEEP A66-80701

BEHAVIOR REFLEX REGULATION OF DECORTICATE CAT, NEURAL MECHANISMS RESPONSIBLE FOR DEEP SLEEP, AND REFLEXES IN CIRCULATION REGULATION DURING SLEEP
AFOSR-65-1579 N66-16469

HUMAN PERFORMANCE AND BEHAVIOR ASSESSMENT IN AIR FORCE SYSTEMS AND SUBSYSTEMS
SSD-65-172/514/R N66-16664

CONDITIONED RESPONSE BEHAVIOR OF DOGS UNDER ACUTE HYPOXIA N66-17149

BERYLLIUM
HEALTH HAZARDS IN HANDLING AND PROCESSING BERYLLIUM AND ITS COMPOUNDS, NOTING EFFECT ON LUNGS AND REVIEWING AEC RECOMMENDATIONS
A66-18854

BETA RADIATION
EQUIPMENT AND PROCEDURE DESCRIPTION FOR AIR SAMPLING BETA RADIATION FALLOUT MEASUREMENTS
RB-65-1 N66-16997

SOLID CHEMICAL SYSTEM FOR CHARGED PARTICLE DOSIMETRY
NASA-CR-70462 N66-17481

BIBLIOGRAPHY
SELECTED BIBLIOGRAPHY ON STUDIES IN PERCEPTION
A66-80512

ENVIRONMENT CONCEPT AS PSYCHOLOGICAL FACTOR, AND PERTINENT LITERATURE REVIEW
TR-33 N66-16507

LITERATURE REVIEW OF HUMAN REACTIONS TO STRUCTURELESS VISUAL FIELD EXPOSURE
TR-34 N66-16508

ANNOTATED BIBLIOGRAPHY ON EXTRATERRESTRIAL LIFE
NASA-SP-7015 N66-16566

AEROSPACE MEDICINE AND BIOLOGY - CONTINUING BIBLIOGRAPHY WITH ABSTRACTS
NASA-SP-7011/21/ N66-17886

BIBLIOGRAPHY OF GLIA CELL STUDIES
NASA-CR-70631 N66-18316

BINOCULAR VISION
EXCITATION OF PERIPHERAL RETINA WITH COINCIDENT AND DISPARATE TEST FIELDS A66-80575

ROLE OF KNOWLEDGE IN DISTANCE PERCEPTION ON BINOCULAR OR MONOCULAR BASIS A66-80664

BIOASTRONAUTICS
NEUROLOGIC ADAPTATIONS AND AUDIOGENIC RESPONSES IN MICE EXPOSED TO CHRONIC 2 X GRAVITY FIELD, NOTING DEVELOPMENT OF MORE EFFICIENT CIRCULATORY SYSTEM, GROWTH PATTERN ALTERATIONS, ETC
A66-17660

SYNTHESIS FRAMEWORK OF EXPERIMENT PROGRAM FOR ORBITING RESEARCH LABORATORIES APPLIED TO BIOSCIENCE FOR DETERMINATION OF ORIGIN, NATURE, AND EVOLUTION OF LIFE
NASA-CR-70342, VOL. B, PT. XII N66-17058

BIOCHEMISTRY
BIOCHEMISTRY DURING SLEEP AND WAKEFULNESS - REVIEW OF EXPERIMENTS IN BRAIN METABOLISM
A66-80689

OPTICAL PROPERTIES OF AMINO ACIDS USING MASS SPECTROMETRY AND GAS CHROMATOGRAPHY
AFOSR-65-1632 N66-16516

HYPEROXEMIC AND HYPOXEMIC CONVULSION EFFECTS ON SUGAR, LACTIC ACID, AND INORGANIC PHOSPHORUS LEVELS IN DOG BLOOD AND SPINAL FLUID
N66-17147

BIOCONTROL SYSTEM
COMPUTATIONAL ANALYSIS EMPLOYING DIGITAL COMPUTERS TO EVALUATE HYPOXIC STRESS REACTIONS IN MAN
A66-17659

BIOELECTRIC POTENTIAL
AVERAGED ELECTRICAL RESPONSES TO DIFFUSE AND TO PATTERNED LIGHT IN HUMAN A66-80671

GALVANIC SKIN RESPONSE, HEART RATE, AND MUSCLE ACTION BIOELECTRIC POTENTIAL SIGNALS AS PSYCHOPHYSIOLOGICAL RESPONSE TO LEARNING TASK DIFFICULTY
NAVTRADEVCEN-IH-34 N66-16639

BIOELECTRICITY
ELECTRICAL ACTIVITY OF PHRENIC NERVE FROM RESPIRATORY CENTER OF DOG DURING OBSTRUCTED BREATHING A66-80601

BIOELECTRICITY HISTORICAL REVIEW AND PRINCIPLES OF MEMBRANE POTENTIAL - ELECTROPHYSIOLOGY
BNL-9337 N66-17175

BIOENGINEERING
MYOELECTRIC POTENTIAL RESPONSE AND FORCE OF MUSCLE CONTRACTION
REPT.-2386 N66-16308

BIOGENESIS
PHYSICAL CHARACTERISTICS OF UNIVERSE AND BIOGENESIS OF EXTRATERRESTRIAL LIFE
A66-80742

ORGANIC SYSTEMS AND BIOGENESIS - ABSTRACTS
NASA-TT-F-9863 N66-18448

BIOINSTRUMENTATION
CONSTRAINT PLATFORM AND BIOTELEMETRY MODULE FOR HUMAN BALLISTOCARDIOGRAM AND ELECTROCARDIOGRAM IN ZERO GRAVITY ENVIRONMENT
NASA-CR-69828 N66-16283

RESEARCH IN EXOBIOLOGY, ENVIRONMENTAL BIOLOGY, BEHAVIORAL BIOLOGY, MOLECULAR BIOLOGY AND BIOINSTRUMENTATION; SPACE FLIGHT PROGRAMS, AND MANNED SPACE FLIGHT
NASA-SP-92 N66-17778

FEASIBILITY OF MULTIPLE BIO-ELECTRODE ARRAYS TO SENSOR GALVANIC SKIN RESPONSE SIGNALS DURING BODY MOVEMENT
NASA-CR-70532 N66-18068

BIOKINETIC THEORY
COMPUTATIONAL ANALYSIS EMPLOYING DIGITAL COMPUTERS TO EVALUATE HYPOXIC STRESS REACTIONS IN MAN
A66-17659

BIOLOGICAL CELL
- HYPOTHESIS TO EXPLAIN INHIBITING EFFECT OF MAGNETIC FIELDS ON CELL GROWTH RATE A66-80647

PHYSICAL PARAMETERS OF BIOLOGICAL LIVING SYSTEMS AND THEIR OPERATIONAL RELATIONSHIPS
JPRS-33830 N66-16397

RADIATION CHIMERA MORTALITY RATE IN RELATION TO NUMBER OF TRANSPLANTED BONE MARROW AND LYMPH NODE CELLS
MBL/1965/23 N66-17484

VIBRATING MIRROR FLYING SPOT ULTRAVIOLET MICROSCOPE WITH INCORPORATED TELEVISION SYSTEM - ULTRAVIOLET RADIATION EFFECTS ON CELL STRUCTURE AND BEHAVIOR
TID-21611 N66-17985

AUTORADIOGRAPHIC METHOD USED FOR STUDIES OF GRANULOCYTOPOIESIS IN MAN
BNL-7955 N66-18287

BIBLIOGRAPHY OF GLIA CELL STUDIES
NASA-CR-70631 N66-18316

BIOLOGICAL EFFECT
RATS EXPOSED TO SPACE CABIN ATMOSPHERE FOR TWO WEEKS, NOTING MORTALITY RATE, ORGANISM FUNCTIONING, GROWTH RATE, ETC A66-17663

BIOSATELLITE FOR TV MONITORING OF DEVELOPMENT OF OPOSSUM EMBRYONIC FETUS IN SPACE ENVIRONMENT A66-18583

ACUTE INHALATION TOXICITY OF OXYGEN DIFLUORIDE IN ALBINO RAT A66-19723

INHALATION TOXICITY AT AMBIENT AND REDUCED PRESSURES IN MONKEYS, DOGS AND RODENTS UPON EXPOSURE TO OZONE, NITROGEN DIOXIDE AND CARBON TETRACHLORIDE A66-19724

CONFERENCE ON PROBLEMS OF USING DEEP HYPOTHERMIA IN TREATING CLINICAL DEATH
JPRS-33971 N66-18094

REGENERATIVE PROCESSES AND ORGANIC CHANGES IN ANIMALS FOLLOWING SHOCK WAVES
DVL-481 N66-18131

BIOLOGICAL MODEL
ONE-STAGE MODEL FOR VISUAL TEMPORAL INTEGRATION A66-80676

GENERAL MODEL OF SPEECH DISCRIMINATION USED TO REFORMULATE MOTOR THEORY OF PERCEPTION
JPRS-34106 N66-16954

BIOLOGICAL RHYTHM
HUMAN ADJUSTMENT TO SHIFT IN DAY-NIGHT CYCLE AND EFFECT OF SPACE FLIGHT ON SLEEP AND ACTIVITY CYCLES OF ASTRONAUTS A66-18582

SUMMARIES OF RESEARCH AND PRESENT KNOWLEDGE OF BIOLOGICAL RHYTHMS IN PLANTS AND ANIMALS A66-80514

CONSIDERATION OF ERRORS IN STUDY OF CIRCADIAN RHYTHMS IN ENERGY METABOLISM A66-80515

PENDULUM VERSUS RELAXATION OSCILLATION IN BIOLOGICAL RHYTHM A66-80516

MATHEMATICAL MODEL FOR CIRCADIAN RHYTHMS A66-80517

OVERT CIRCADIAN FREQUENCIES AND CIRCADIAN RULE A66-80525

RESPONSE CURVES IN CIRCADIAN PERIODICITY - SYNCHRONIZATION AND PHASE SHIFT IN ANIMALS AND PLANTS A66-80526

SYNCHRONIZATION AND RANGES OF ENTRAINMENT IN CIRCADIAN RHYTHM A66-80527

SOME ASPECTS OF BIOLOGICAL DATA ANALYSIS - LONGITUDINAL AND TRANSVERSE PROFILES OF RHYTHMS A66-80528

CELL DIVISION RHYTHM AND CIRCADIAN CLOCK IN PLANTS AND ANIMALS A66-80529

EFFECT OF TEMPERATURE VARIATIONS ON BIOLOGICAL CLOCKS IN PLANTS AND ANIMALS A66-80530

MOLECULAR ASPECTS OF CIRCADIAN SYSTEMS IN MITOSIS AND PHOTOSYNTHESIS IN MICROORGANISMS A66-80531

BIOCHEMICAL FACTORS IN PHOTOSYNTHESIS RHYTHM IN ALGAE, GONYAULAX POLYEDRA A66-80532

ROLE OF NUCLEUS IN CYTOPLASMIC DIURNAL RHYTHM OF GREEN ALGAE OXYGEN PRODUCTION A66-80533

ROLE OF ENDOCRINE AND CENTRAL NERVOUS SYSTEMS IN VARIOUS BIOLOGICAL RHYTHMS IN INSECTS, CRUSTACEANS AND VERTEBRATES CONCERNING METABOLISM A66-80534

VARIATIONS OF RESISTANCE AND RESPONSIVENESS AND CIRCADIAN ADRENAL CYCLE IN NORMAL SUBJECTS AND PATIENTS A66-80535

DEVIATIONS FROM HUMAN RHYTHMIC METABOLIC FUNCTIONS A66-80536

UNIFIED THEORY FOR BIOLOGICAL RHYTHMS - ENVIRONMENTAL PERIODICITIES AS TIMERS ON PLANT AND ANIMAL RHYTHMS A66-80537

PHASE-ANGLE DIFFERENCE IN CIRCADIAN PERIODICITY OF ORGANISM AND ENVIRONMENTAL PERIODICITY A66-80538

MECHANISM OF ENTRAINMENT OF CIRCADIAN RHYTHM BY LIGHT CYCLES USING DROSOPHILA PUPAL ECLOSION RHYTHM AS MODEL A66-80539

PERSISTENCE OF CIRCADIAN RHYTHM IN HIBERNATING RODENTS A66-80540

RELATIONSHIP BETWEEN PLANT PHOTOPERIODICITY AND CIRCADIAN RHYTHM A66-80541

CIRCADIAN SYSTEMS OF METABOLISM AND TESTICULAR RESPONSE IN PHOTOPERIODIC RESPONSES IN VERTEBRATES A66-80542

SHIFT IN CIRCADIAN RHYTHM PHASES IN CANARY, SERINUS CANARIUS, IN SELF-SELECTION, IMPOSED DARKNESS, AND AFTER ADMINISTRATION OF RESERPINE AND TRIIODOTHYRONINE A66-80543

CIRCADIAN RHYTHM AND PHOTOPERIODIC REGULATION OF ANNUAL REPRODUCTIVE CYCLE IN BIRDS A66-80544

CIRCADIAN RHYTHM CONTROL OF VERNAL TESTICULAR RESPONSE IN HOUSE FINCH, CARPODACUS MEXICANUS A66-80545

CIRCADIAN RHYTHM OF TESTICULAR RESPONSE AND PHOTOPERIODICITY IN HOUSE SPARROW, PASSER DOMESTICUS A66-80546

PHASE SHIFTING OF HUMAN CIRCADIAN SYSTEM DURING TRANSCONTINENTAL JET FLIGHTS A66-80547

DEMONSTRATION AND VARIATION OF CIRCADIAN RHYTHM OF ACTIVITY IN SINGLE NEURON OF SEA HARE A66-80548

CLOCK MECHANISMS IN CELESTIAL ORIENTATION OF ANIMALS A66-80549

BIOLOGICAL RHYTHM, ENVIRONMENTAL PERIODICITIES, AND MATHEMATICAL MODELS A66-80550

INFLUENCE OF POSTURE AND DIURNAL RHYTHM ON RENAL EXCRETION OF ACID IN NORMAL MEN AND ADRENALECTOMIZED PATIENTS A66-80632

CIRCADIAN CYCLE OF URINARY HYDROCORTISONE IN HEALTHY SUBJECTS AND PATIENTS WITH CUSHING*S

SYNDROME A66-80733

BIOLOGY /GEN/
RESEARCH IN EXOBIOLOGY, ENVIRONMENTAL BIOLOGY, BEHAVIORAL BIOLOGY, MOLECULAR BIOLOGY AND BIOINSTRUMENTATION, SPACE FLIGHT PROGRAMS, AND MANNED SPACE FLIGHT
NASA-SP-92 N66-17778

AEROSPACE MEDICINE AND BIOLOGY - CONTINUING BIBLIOGRAPHY WITH ABSTRACTS
NASA-SP-7011/21/ N66-17886

BIOPHYSICS
PHYSICAL PARAMETERS OF BIOLOGICAL LIVING SYSTEMS AND THEIR OPERATIONAL RELATIONSHIPS
JPRS-33830 N66-16397

NEUTRON ACTIVATION AND SCINTILLATION COUNTERS FOR DETECTION OF SODIUM AND POTASSIUM IN BIOLOGICAL MEDIA
CEA-R-2837 N66-17491

BIOSATELLITE
N ASA BIOSATELLITE STUDY OF ORGANISM IN SPACE ENVIRONMENT, WITH EMPHASIS ON WEIGHTLESSNESS AND RADIATION EFFECT A66-17615

BIOSATELLITE FOR TV MONITORING OF DEVELOPMENT OF OPOSSUM EMBRYONIC FETUS IN SPACE ENVIRONMENT A66-18583

BIRD
SHIFT IN CIRCADIAN RHYTHM PHASES IN CANARY, SERINUS CANARIUS, IN SELF-SELECTION, IMPOSED DARKNESS, AND AFTER ADMINISTRATION OF RESERPINE AND TRIIODOTHYRONINE A66-80543

CIRCADIAN RHYTHM AND PHOTOPERIODIC REGULATION OF ANNUAL REPRODUCTIVE CYCLE IN BIRDS A66-80544

CIRCADIAN RHYTHM CONTROL OF VERNAL TESTICULAR RESPONSE IN HOUSE FINCH, CAPRODACUS MEXICANUS A66-80545

CIRCADIAN RHYTHM OF TESTICULAR RESPONSE AND PHOTOPERIODICITY IN HOUSE SPARROW, PASSER DOMESTICUS A66-80546

BLADDER
URINARY BLADDER CALCULI FORMED AT HIGH ALTITUDE IN RATS A66-80670

BLOOD
EFFECT OF BLOOD HYDROGEN ION CONCENTRATION ON HYPOXIC PULMONARY VASOCONSTRICTION IN DOGS A66-80586

BLOOD, PLASMA, AND RED CELL VOLUMES OF YOUNG AND OLD MEN DURING REST AND EXERCISE IN DESERT ENVIRONMENT AND AT HIGH ALTITUDE A66-80606

MEASURING BLOOD OXYGEN TENSION WITH MICROCATHODE ELECTRODE A66-80622

POLAROGRAPHIC MEASUREMENT OF BLOOD OXYGEN TENSION AS AFFECTED BY PH, HEPARIN, HEMATOCRIT AND ENVIRONMENTAL TEMPERATURE A66-80623

EFFECT OF LOW ENVIRONMENTAL TEMPERATURE ON CELLULAR BLOOD ELEMENTS AND WEIGHT GAIN IN RABBITS A66-80639

MOSSBAUER EFFECT IN FE57 STUDYING HEMOGLOBIN, OXYHEMOGLOBIN, CARBOHEMOGLOBIN, CARBOXYHEMOGLOBIN, HEMIN, AND HEME OF HUMAN AND RAT BLOOD A66-80646

INFLUNCE OF MODERATE ALCOHOLEMIC VALUES ON SOME ASPECTS OF PSYCHOMOTOR REACTIVITY A66-80727

BLOOD CIRCULATION
PHYSIOLOGICAL AND CLINICAL APPLICATIONS OF TRANSCUTANEOUS DOPPLER FLOWMETER APPLYING TRANSDUCER TO SKIN SURFACE OVER STRATEGIC SITES TO INDICATE BLOOD FLOW VELOCITY A66-80604

REGIONAL BLOOD FLOW TO BRAIN, INTESTINE, AND HIND LIMB AND TOTAL BLOOD FLOW OF DOG BREATHING PURE OXYGEN A66-80605

OPERATIONAL CAPABILITY AND PHYSIOLOGICAL AND CLINICAL APPLICATIONS OF TRANSCUTANEOUS ULTRASONIC BLOOD VELOCITY METER A66-80620

CIRCULATION OF CEREBRAL CORTEX AND ARTERIAL BLOOD PRESSURE CORRELATION WITH ELECTROENCEPHALOGRAM OF RAPID EYE MOVEMENT STATE A66-80699

CIRCULATING BLOOD VOLUME CHANGES IN DOGS BREATHING OXYGEN UNDER PRESSURE N66-17143

WEIGHTLESSNESS EFFECTS ON CIRCULATORY SYSTEM AND MUSCULAR ACTIVITY OF ANIMALS AND HUMANS DURING SPACE FLIGHTS
JPRS-34064 N66-18028

BLOOD FLOW
RENAL BLOOD FLOW AND EXTRACELLULAR VOLUME, RENAL AND CARDIAC EFFECTS ON SODIUM EXCRETION, AND ABNORMAL CIRCULATORY STATE EFFECTS ON CARDIAC RATE AND BLOOD PRESSURE - DOG & HUMAN PHYSIOLOGY
NASA-CR-70316 N66-17072

BLOOD PLASMA
BLOOD, PLASMA, AND RED CELL VOLUMES OF YOUNG AND OLD MEN DURING REST AND EXERCISE IN DESERT ENVIRONMENT AND AT HIGH ALTITUDE A66-80606

PLASMA AND SWEAT HISTAMINE CONCENTRATIONS OF HUMAN SUBJECTS AFTER HEAT EXPOSURE AND PHYSICAL EXERCISE A66-80611

MUSCULAR ORIGIN OF ELEVATED PLASMA POTASSIUM DURING PHYSICAL EXERCISE IN MAN A66-80618

BLOOD PRESSURE
PULMONARY DIFFUSING CAPACITY AND CARDIOVASCULAR RESPONSE IN MAN AS AFFECTED BY APPREHENSION A66-80602

CIRCULATION OF CEREBRAL CORTEX AND ARTERIAL BLOOD PRESSURE CORRELATION WITH ELECTROENCEPHALOGRAM OF RAPID EYE MOVEMENT STATE A66-80699

ELECTROCARDIOGRAPHIC STUDY AND COURSE OF ARTERIAL PRESSURE AT VARIOUS BODY POSITIONS ON TILTING TABLE A66-80712

ROLE OF PROPRIOCEPTIVE IMPULSES DURING RESPIRATION WITH INCREASED INTRAPULMONARY PRESSURE IN REGULATING RESPIRATION AND CIRCULATION N66-17156

CHANGES IN CAROTID SINUS PRESSOR AND DEPRESSOR REFLEXES DURING RESPIRATION UNDER INCREASED INTRAPULMONARY PRESSURE N66-17157

ROLE OF VAGUS NERVES IN CIRCULATORY AND RESPIRATORY REACTIONS DURING INCREASED INTRAPULMONARY PRESSURE N66-17158

EFFECT OF GAS EXPANSION IN GASTROINTESTINAL TRACT DURING BAROMETRIC PRESSURE CHANGES ON RESPIRATORY AND CARDIOVASCULAR REFLEXES N66-17159

BODY COMPOSITION /BIOL/
PHYSIOLOGY OF CHRONIC ADAPTATION TO HIGH ELEVATIONS - ACCLIMIZATION
JPRS-33871 N66-16325

BODY MEASUREMENT
U SAF WHOLE BODY GAMMA SPECTROMETRY IN SUPPORT OF AIR FORCE AEROSPACE MISSION A66-17664

BODY MEASUREMENT /BIOL/
BODY MEASUREMENTS OF PILOTS MADE DURING ANTHROPOMETRIC SURVEY - APPLICATIONS TO EQUIPMENT DESIGN N66-16534

FEASIBILITY OF MULTIPLE BIO-ELECTRODE ARRAYS TO SENSOR GALVANIC SKIN RESPONSE SIGNALS DURING BODY MOVEMENT

NASA-CR-70532 N66-18068

RADIATION DOSIMETRY OF PERSONNEL AT NUCLEAR FACILITIES
AE-211 N66-18133

BODY TEMPERATURE /BIOL/
NOCTURNAL BODY TEMPERATURE, SWEATING RATE, AND DEPTH OF SLEEP MONITORED BY ELECTRONCEPHALOGRAPHY A66-80610

HEART RATE, OXYGEN CONSUMPTION, AND BODY TEMPERATURE AND WEIGHT OF DEHYDRATED SUBJECTS DURING EXERCISE IN HOT ENVIRONMENT A66-80617

POSSIBLE APPLICATION OF HYPOTHERMIA STATE FOR LONG PERIODS OF SPACE FLIGHT
JPRS-34093 N66-18036

BODY WEIGHT
INFANTILE TREADMILL EXPERIENCE EFFECT ON BODY WEIGHT AND RESISTANCE TO EXHAUSTION IN RAT A66-17460

AVOIDANCE LEARNING, BLOOD GLUCOSE LEVEL, BODY WEIGHT, AND PROTEIN BOUND IODINE OF RAT EXPOSED TO COLD STRESS AND HABENULAR LESION A66-80614

HEART RATE, OXYGEN CONSUMPTION, AND BODY TEMPERATURE AND WEIGHT OF DEHYDRATED SUBJECTS DURING EXERCISE IN HOT ENVIRONMENT A66-80617

EFFECT OF LOW ENVIRONMENTAL TEMPERATURE ON CELLULAR BLOOD ELEMENTS AND WEIGHT GAIN IN RABBITS A66-80639

BONE
BONE CALCIUM LEVELS DURING TWO WEEKS OF SIMULATED WEIGHTLESSNESS IN HUMAN SUBJECTS A66-80562

DIURNAL VARIATION IN COLLAGEN RIBONUCLEIC ACID, DEOXYRIBONUCLEIC ACID, LACTATE, AND CALCIUM METABOLIC ACTIVITY OF RAT BONE TISSUE A66-80574

INTERACTION OF DIETARY PROTEIN AND CALCIUM ON GROWTH AND MAINTENANCE OF BONES OF YOUNG, ADULT, AND AGED RATS A66-80711

STRUCTURAL RELATION OF ABNORMAL CALCIFICATIONS WITH COLLAGEN MATRIX IN DISEASED HUMAN BONES - STUDY OF BONE DYSPLASIA BY X-RAY DIFFRACTION N66-16362

DETERMINING THICKNESS AND MINERAL CONTENT IN VERTEBRA AND OTHER BONES BY X-RAY AND OTHER DENSITOMETRY - APPLICATION OF TECHNIQUES TO HUMAN STUDIES
NASA-SP-64 N66-17666

THEORETICAL ASPECTS OF RADIOGRAPHIC DENSITOMETRY USED TO DETERMINE MINERAL CONTENT IN BONE N66-17667

QUANTITATIVE RADIOGRAPHY OF BONE MASS AND DENSITY MEASURED BY X-RAYS N66-17668

CORTICAL BONE VOLUME AND LUMBAR SPINE DENSITY RELATED TO AGING IN WOMEN - X-RAY MEASUREMENTS OF RELATIVE VERTEBRAL DENSITY N66-17669

RADIOGRAPHIC BONE DENSITOMETRY FOR BONE MASS DETERMINATIONS IN OS CALCIS, MIDDLE PHALANX OF FIFTH DIGIT, AND PATELLA N66-17670

FACTORS AFFECTING RADIOGRAPHIC DENSITOMETRY OF LUMBAR SPINE AND FEMORAL NECK N66-17671

COMPARISON OF CORTICAL THICKNESS AND RADIOGRAPHIC MICRODENSITOMETER MEASUREMENTS IN DETERMINING BONE LOSS N66-17672

MINERAL CONTENT OF BONE CORTEX RELATED TO THICKNESS IN SECOND METACARPAL AS A FUNCTION OF AGE AND SEX N66-17673

BONE MINERAL MEASUREMENTS BY PHOTON ABSORPTION WITH IMPROVED SCANNING DEVICE N66-17674

BONE MINERAL CONTENT IN DOMESTIC HEN MEASURED BY ATTENUATION OF MONOENERGETIC PHOTON BEAM N66-17675

SOFT X-RAY-RADIATION FOR BONE DENSITOMETRY USING GAMMA RADIOISOTOPE SOURCE IN PRECISION X-RAY TUBE N66-17676

IODINE 125 FOR USE IN BONE DENSITOMETRY N66-17677

ULTRASONIC METHODS TO MEASURE BONE MASSES AND OTHER TISSUES IN SITU N66-17679

ASH CONCENTRATION, FEMORAL THICKNESS, AND VERTEBRAL MINERALIZATION RELATED TO AGING IN HUMANS N66-17680

MEASUREMENTS OF BONE VOLUME AND VERTEBRAL DENSITY N66-17681

ESTROGENS USED IN POSTMENOPAUSAL OSTEOPOROSIS TO RETARD LOSS IN BONE MASS N66-17682

CALCIUM METABOLISM AND BONE MASS CHANGES RESULTING FROM CONTINUOUS PERIODS OF BED REST N66-17683

REGRESSION CURVES COMPUTED FROM URINARY CALCIUM EXCRETION AND BONE MASS DATA OBTAINED FROM MEN IN BED REST AND AMBULATORY STUDIES N66-17684

AGE ASSOCIATED BONE LOSS MEASUREMENTS IN HANDS OF THREE RACES N66-17685

CORTICAL BONE THICKNESS MEASUREMENTS N66-17686

EFFECT OF WEIGHTLESSNESS AND IMMOBILIZATION ON BONE DEMINERALIZATION OF PRIMARY AND BACKUP GEMINI V CREW USING RADIOGRAPHIC BONE DENSITOMETRY N66-18014

BONE MARROW
RADIATION CHIMERA MORTALITY RATE IN RELATION TO NUMBER OF TRANSPLANTED BONE MARROW AND LYMPH NODE CELLS
MBL/1965/23 N66-17484

BRAIN
AMPLITUDE OF PHOTICALLY EVOKED POTENTIALS BY CONDITIONED STIMULUS IN CAT A66-80580

EFFECT OF HYPERBARIA AND HYBAROXIA ON CALIBER OF RETINAL AND CEREBRAL VESSELS IN MAN A66-80581

REGIONAL BLOOD FLOW TO BRAIN, INTESTINE, AND HIND LIMB AND TOTAL BLOOD FLOW OF DOG BREATHING PURE OXYGEN A66-80605

AVERAGED ELECTRICAL RESPONSES TO DIFFUSE AND TO PATTERNED LIGHT IN HUMAN A66-80671

MORPHOLOGY AND FUNCTION OF SLEEP PHYSIOLOGY A66-80688

BIOCHEMISTRY DURING SLEEP AND WAKEFULNESS - REVIEW OF EXPERIMENTS IN BRAIN METABOLISM A66-80689

EFFECT OF ACETYLCHOLINE, ESERINE, ATROPINE, AND CARBACHOL ON SLEEP INDUCTION PATH IN BRAIN IN CATS A66-80692

THALAMIC TRANSMISSION DURING SLEEP AND WAKEFULNESS IN CATS A66-80705

CORTICAL ACTIVITY DURING SLEEP AND WAKEFULNESS IN CATS A66-80706

OXYGEN TENSION CHANGES IN BRAIN TISSUE OF RATS SUBJECTED TO TRANSVERSE ACCELERATION A66-80743

SELF REGULATION AND MEMORY LOCATION IN HUMAN BRAIN
JPRS-33898 N66-16258

BRAIN CIRCULATION
RELATION OF ELECTROENCEPHALOGRAM TO BRAIN CORTEX METABOLISM IN MAMMALS A66-80691

BRAIN INJURY
AVOIDANCE LEARNING, BLOOD GLUCOSE LEVEL, BODY WEIGHT, AND PROTEIN BOUND IODINE OF RAT EXPOSED TO COLD STRESS AND HABENULAR LESION A66-80614

BRAIN STEM
BRAIN STEM MECHANISMS ANTAGONISTIC TO RETICULAR ACTIVATING SYSTEM A66-80693

BULBAR CONTROL OF AROUSAL SYSTEM IN CATS A66-80695

STUDY OF MECHANISMS OF DUALITY OF SLEEP A66-80703

BEHAVIOR REFLEX REGULATION OF DECORTICATE CAT, NEURAL MECHANISMS RESPONSIBLE FOR DEEP SLEEP, AND REFLEXES IN CIRCULATION REGULATION DURING SLEEP
AFOSR-65-1579 N66-16469

ANATOMY OF CENTRE MEDIAN NUCLEUS OF LUYS
NASA-TM-X-56159 N66-18369

BREATHING MODE
ELECTRICAL ACTIVITY OF PHRENIC NERVE FROM RESPIRATORY CENTER OF DOG DURING OBSTRUCTED BREATHING A66-80601

BRIGHTNESS DISCRIMINATION
CATEGORY JUDGMENTS AS FUNCTIONS OF FLASH LUMINANCE AND DURATION A66-80673

C

CABIN ATMOSPHERE
FROG RESPIRATORY SYSTEM CILIARY MUCOUS TRANSPORT DECREMENT IN CLOSED CONTROLLED SUBMARINE CABIN ATMOSPHERE - ANIMAL STUDY
REPT.-443 N66-16990

CALCIUM
INTERACTION OF DIETARY PROTEIN AND CALCIUM ON GROWTH AND MAINTENANCE OF BONES OF YOUNG, ADULT, AND AGED RATS A66-80711

CALCIUM METABOLISM
BONE CALCIUM LEVELS DURING TWO WEEKS OF SIMULATED WEIGHTLESSNESS IN HUMAN SUBJECTS A66-80562

DIURNAL VARIATION IN COLLAGEN RIBONUCLEIC ACID, DEOXYRIBONUCLEIC ACID, LACTATE, AND CALCIUM METABOLIC ACTIVITY OF RAT BONE TISSUE A66-80574

CALCIUM METABOLISM AND BONE MASS CHANGES RESULTING FROM CONTINUOUS PERIODS OF BED REST N66-17683

REGRESSION CURVES COMPUTED FROM URINARY CALCIUM EXCRETION AND BONE MASS DATA OBTAINED FROM MEN IN BED REST AND AMBULATORY STUDIES N66-17684

AGE ASSOCIATED BONE LOSS MEASUREMENTS IN HANDS OF THREE RACES N66-17685

CORTICAL BONE THICKNESS MEASUREMENTS N66-17686

CALCULUS /BIOL/
URINARY BLADDER CALCULI FORMED AT HIGH ALTITUDE IN RATS A66-80670

CALIBRATION
SLOW NEUTRON CALIBRATION OF FILM AND GAMMA DOSIMETERS
AERE-R-4960 N66-18214

CALORIC STIMULUS
DETERMINATION OF THRESHOLD EXCITABILITY OF SEMICIRCULAR CANALS WITH THERMAL STIMULATION METHOD IN PIGEONS A66-80738

CARBOHYDRATE METABOLISM
AMELIORATIVE VALUE OF CARBOHYDRATE AND ELECTROLYTES TO SURVIVAL OF FASTING HUMAN SUBJECTS IN ARCTIC A66-80613

EFFECT OF PROLONGED COLD AND STARVATION, AND SUBSEQUENT REFEEDING ON PLASMA LIPIDS AND GLUCOSE IN NORMAL MAN A66-80630

PHOSPHORYLATION OF FRUCTOSE IN RAT SKELETAL MUSCLES AND LIVER TISSUES DURING HYPOXIA AT SIMULATED ALTITUDE A66-80656

CARBON DIOXIDE
PERMEABILITY MEASUREMENTS FOR DIFFUSION OF CARBON DIOXIDE AND GLUCOSE THROUGH SILICON RUBBER AND TEFLON IN STUDY OF ENZYMATIC BREAKDOWN PRODUCTS SEPARATION
NASA-CR-70190 N66-16968

DINITROPHENOL-INDUCED HYPERTHERMIA UNDER ALTERED PARTIAL PRESSURES OF OXYGEN AND CARBON DIOXIDE N66-17150

CARBON DIOXIDE CONCENTRATION
CARBON DIOXIDE INDUCED MILD HYPOXIA, CORRECTION OF ALTERATIONS ON PERFORMANCE OF PSYCHOLOGIC AND PSYCHOMOTOR SYSTEMS A66-17661

INCREASED CARBON DIOXIDE CONTENT EFFECT ON ANIMAL BREATHING IN GAS PRESSURE CHAMBER N66-17151

CARBON DIOXIDE REMOVAL
SOLID ELECTROLYTE CARBON DIOXIDE REDUCTION SYSTEM FOR SUBORBITAL FLIGHT
AMRL-TR-65-153 N66-16643

CARBON DIOXIDE TENSION
VENTILATORY RESPONSE TO HYPOXIA AND CARBON DIOXIDE FOLLOWING CARBON DIOXIDE EXPOSURE AND SODIUM BICARBONATE INGESTION IN MAN A66-80588

OXYGEN PRESSURE VENTILATION RESPONSE CURVE WITH NORMAL HYDROGEN ION CONCENTRATION AND CARBON DIOXIDE PRESSURE IN DOGS A66-80592

DIGITAL COMPUTER SIMULATION OF RESPIRATORY RESPONSE TO CEREBROSPINAL FLUID CARBON DIOXIDE TENSION OF CAT A66-80648

RELATIONSHIP OF PULMONARY VENTILATION AND CARBON DIOXIDE TENSION TO SLEEP AND WAKEFULNESS LEVELS RECORDED BY ELECTROENCEPHALOGRAM IN HUMANS A66-80707

CARBON MONOXIDE
SYNCOPE INDUCED BY APPLICATION OF NEGATIVE PRESSURE TO LOWER BODY AND EFFECT ON LUNG CARBON MONOXIDE DIFFUSING CAPACITY A66-80565

DIURNAL VARIATION IN PULMONARY DIFFUSING CAPACITY OF MAN FOR CARBON MONOXIDE A66-80603

CARBOXYHEMOGLOBIN
CELL AND SOLUTION VELOCITY CONSTANTS FOR REACTION TO FORM CARBOXYHEMOGLOBIN AT DIFFERENT TEMPERATURES RED BLOOD CELL SIZE A66-80557

MOSSBAUER EFFECT IN FE57 STUDYING HEMOGLOBIN, OXYHEMOGLOBIN, CARBOHEMOGLOBIN, CARBOXYHEMOGLOBIN, HEMIN, AND HEME OF HUMAN AND RAT BLOOD A66-80646

CARDIOLOGY
HEART ACTIVITY DURING HIGH PRESSURE OXYGEN TOXICITY IN DOGS AND GUINEA PIGS N66-17142

CARDIOVASCULAR SYSTEM
PRESSURE CHAMBER EXPERIMENTS FOR STUDYING CHANGES IN MOTOR, CADIOVASCULAR, RESPIRATORY, AND CENTRAL NERVOUS SYSTEMS DURING OXYGEN TOXICITY N66-17145

TREATMENT OF PULMONARY PRESSURE TRAUMA BY REMOVAL OF EXCESS GAS FROM INTERPLEURAL CAVITIES
N66-17155

CHANGES IN CAROTID SINUS PRESSOR AND DEPRESSOR REFLEXES DURING RESPIRATION UNDER INCREASED INTRAPULMONARY PRESSURE N66-17157

ROLE OF VAGUS NERVES IN CIRCULATORY AND RESPIRATORY REACTIONS DURING INCREASED INTRAPULMONARY PRESSURE N66-17158

EFFECT OF GAS EXPANSION IN GASTROINTESTINAL TRACT DURING BAROMETRIC PRESSURE CHANGES ON RESPIRATORY AND CARDIOVASCULAR REFLEXES
N66-17159

EFFICACY OF CARDIOVASCULAR CONDITIONING WITH PULSATILE LEG CUFF TECHNIQUE IN DECREASING ORTHOSTATIC HYPOTENSION OF GEMINI V ASTRONAUTS
N66-18012

EVALUATION OF PHYSICAL CONDITION OF GEMINI V ASTRONAUTS BY CARDIOVASCULAR SYSTEM RESPONSE TO CALIBRATED WORK LOAD N66-18013

CAROTID SINUS REFLEX
CHANGES IN CAROTID SINUS PRESSOR AND DEPRESSOR REFLEXES DURING RESPIRATION UNDER INCREASED INTRAPULMONARY PRESSURE N66-17157

CASE HISTORY
CASE HISTORY OF MYOCARDIAL INFARCTION AFTER GASTROINTESTINAL ACUTE HEMORRHAGE IN COMMERCIAL PILOT A66-80571

SEAT BELT INJURIES IN AIRCRAFT ACCIDENTS - CASE HISTORIES FOR EVIDENCE OF SYNDROME
A66-80633

VERTEBRAL COLUMN INJURY DURING AIRCRAFT ACCIDENTS - CASE HISTORY A66-80722

RETINAL DETACHMENT IN PILOT INCURRED IN FLIGHT - CASE HISTORY A66-80728

CAT
AMPLITUDE OF PHOTICALLY EVOKED POTENTIALS BY CONDITIONED STIMULUS IN CAT A66-80580

NOREPINEPHRINE AND ANGIOTENSIN EFFECTS ON CORONARY FLOW AND MYOCARDIAL OXYGEN CONSUMPTION IN CAT A66-80635

DIGITAL COMPUTER SIMULATION OF RESPIRATORY RESPONSE TO CEREBROSPINAL FLUID CARBON DIOXIDE TENSION OF CAT A66-80648

ROLE OF REFLEXES FROM SINOCAROTID ZONE IN RESPIRATION CONTROL DURING EXCESSIVE INTRAPULMONARY OXYGEN TENSION IN CATS
A66-80655

FUNCTIONAL ORGANIZATION OF HAIRY SKIN IN RESPONSE TO SENSORY STIMULI A66-80662

EFFECT OF ACETYLCHOLINE, ESERINE, ATROPINE, AND CARBACHOL ON SLEEP INDUCTION PATH IN BRAIN IN CATS
A66-80692

BRAIN STEM MECHANISMS ANTAGONISTIC TO RETICULAR ACTIVATING SYSTEM A66-80693

BULBAR CONTROL OF AROUSAL SYSTEM IN CATS
A66-80695

HYPOTHALAMIC CONTROL OF SLEEP MECHANISM IN CATS
A66-80696

CIRCULATION OF CEREBRAL CORTEX AND ARTERIAL BLOOD PRESSURE CORRELATION WITH ELECTROENCEPHALOGRAM OF RAPID EYE MOVEMENT STATE A66-80699

SOMATIC AFFERENT VOLLEYS AND INHIBITORY CONTROL OF SPINAL REFLEXES DURING SLEEP IN CATS
A66-80702

THALAMIC TRANSMISSION DURING SLEEP AND WAKEFULNESS IN CATS A66-80705

CORTICAL ACTIVITY DURING SLEEP AND WAKEFULNESS IN CATS A66-80706

BEHAVIOR REFLEX REGULATION OF DECORTICATE CAT, NEURAL MECHANISMS RESPONSIBLE FOR DEEP SLEEP, AND REFLEXES IN CIRCULATION REGULATION DURING SLEEP
AFOSR-65-1579 N66-16469

EFFECT OF OXYGEN BREATHING IN RESORPTION OF GAS EMBOLISM IN VASCULAR SYSTEM OF CATS AND ON COURSE OF PULMONARY PRESSURE TRAUMA
N66-17154

CATALYTIC ACTIVITY
CATALYTIC ACTIVITY AND CHEMICAL PROPERTIES OF POLY-ALPHA-AMINO ACIDS AND POLYNUCLEOTIDES
NASA-CR-70384 N66-17273

CATECHOLAMINE
RELATIVE EFFECT OF HYPOXIA AND HYPERCAPNIA ON ADRENAL MEDULLARY SECRETION IN ANESTHETIZED DOGS
A66-80640

CENTRAL NERVOUS SYSTEM
ROLE OF ENDOCRINE AND CENTRAL NERVOUS SYSTEMS IN VARIOUS BIOLOGICAL RHYTHMS IN INSECTS, CRUSTACEANS AND VERTEBRATES CONCERNING METABOLISM
A66-80534

ROLE OF HIGHER NERVOUS SYSTEM IN MECHANISM OF INTERACTION OF RESPIRATORY AND VASOMOTOR CENTERS DURING DEVELOPMENT OF HEMIC HYPOXIA AND FUNCTIONAL RESTORATION A66-80658

FUNDAMENTAL RESPONSE CURVES OF NORMAL AND DEUTERANOMALOUS OBSERVER DERIVED FROM CHROMATIC ADAPTATION DATA A66-80680

VIGILANCE PERFORMANCE OF MEN WITH DIFFERENT TYPES OF CENTRAL NERVOUS SYSTEM A66-80734

ANATOMY OF CENTRE MEDIAN NUCLEUS OF LUYS
NASA-TM-X-56159 N66-18369

CEREBRAL CORTEX
VISUALLY EVOKED CORTICAL RESPONSE CORRELATES OF PERCEPTUAL MASKING AND ENHANCEMENT
A66-80578

SHIFTS OF CEREBRAL CORTICAL STEADY POTENTIAL DURING SLEEP A66-80698

CIRCULATION OF CEREBRAL CORTEX AND ARTERIAL BLOOD PRESSURE CORRELATION WITH ELECTROENCEPHALOGRAM OF RAPID EYE MOVEMENT STATE A66-80699

PROPOSED CEREBRAL CORTEX DUPLICATION OF FOURIER OPTICAL TRANSFORM PROCESS AND SPACIAL FILTERING - MATHEMATICAL MODEL
GE/EE/65-18 N66-16986

CEREBROSPINAL FLUID
DIGITAL COMPUTER SIMULATION OF RESPIRATORY RESPONSE TO CEREBROSPINAL FLUID CARBON DIOXIDE TENSION OF CAT A66-80648

CEREBRUM
NEURONAL ACTIVITY IN VISUAL AND MOTOR CORTEX DURING SLEEP AND WAKING IN MAMMALS
A66-80697

CEREBRAL CORTEX AND SUBCORTEX RELATIONSHIPS IN CHIMPANZEE DURING SLEEP, WAKEFULNESS, AND RAPID EYE MOVEMENT STATE A66-80704

HUMAN ELECTROENCEPHALOGRAM GENERATOR SPECTRAL ANALYSIS IN POSTERIOR CEREBRAL REGIONS
NASA-CR-57050 N66-18389

CHARGED PARTICLE
SOLID CHEMICAL SYSTEM FOR CHARGED PARTICLE DOSIMETRY
NASA-CR-70462 N66-17481

CHEMICAL PROPERTY
CATALYTIC ACTIVITY AND CHEMICAL PROPERTIES OF POLY-ALPHA-AMINO ACIDS AND POLYNUCLEOTIDES
NASA-CR-70384 N66-17273

PHYSICAL AND CHEMICAL PROPERTIES BY SEDIMENTATION AND SPECTRAL ANALYSIS FOR PURIFIED STAPHYLOCOCCAL ENTEROTOXIN B
AD-444380 N66-17644

CHEMICAL REACTION
CELL AND SOLUTION VELOCITY CONSTANTS FOR REACTION TO FORM CARBOXYHEMOGLOBIN AT DIFFERENT TEMPERATURES RED BLOOD CELL SIZE
A66-80557

CHEMORECEPTOR
DYNAMIC RESPONSE CHARACTERISTICS OF CHEMOREFLEX ROLE IN VENTILATORY DEPRESSION IN MAN ON ABRUPT ADMINISTRATION OF OXYGEN A66-80594

CHICKEN
AGE DEPENDENCE OF RESISTANCE OF CHICKENS TO 100 PERCENT OXYGEN AT ONE ATM / OAP/, NOTING DELAYED MORTALITY IN ADULT BIRDS A66-17458

BONE MINERAL CONTENT IN DOMESTIC HEN MEASURED BY ATTENUATION OF MONOENERGETIC PHOTON BEAM
N66-17675

EXPERIMENT TO DETERMINE CHICKEN REACTION TO 100 PERCENT OXYGEN AT ATMOSPHERIC PRESSURE
NASA-CR-60380 N66-18391

CHIMPANZEE
CEREBRAL CORTEX AND SUBCORTEX RELATIONSHIPS IN CHIMPANZEE DURING SLEEP, WAKEFULNESS, AND RAPID EYE MOVEMENT STATE A66-80704

CHLORELLA
EXTRACTS OF CHLORELLA CELLS AS GROWTH FACTOR OF PROTOZOAN TETRAHYMENA PYRIFORMIS,
A66-80735

CHOLINERGICS
EFFECT OF ACETYLCHOLINE, ESERINE, ATROPINE, AND CARBACHOL ON SLEEP INDUCTION PATH IN BRAIN IN CATS
A66-80692

CHROMATOGRAPHY
ANOMERIC SPECIFICITY OF YEAST GALACTOKINASE BY CHROMATOGRAPHIC METHODS
NASA-TM-X-56057 N66-17218

CHROMOSOME
EFFECTS OF VIBRATION, ACCELERATION AND IRRADIATION ON CHROMOSOMES IN MICE A66-80741

CIRCULATORY SYSTEM
CIRCULATORY EFFECTS OF CAROTID ARTERY STRETCH RECEPTORS STIMULATION IN MAN AT REST AND DURING EXERCISE A66-80555

PULMONARY DIFFUSION AND CAPILLARY BLOOD VOLUME IN DOGS AT REST AND WITH EXERCISE A66-80600

ROLE OF SYMPATHETIC NERVOUS SYSTEM IN CIRCULATORY RESPONSE TO ARTERIAL HYPOXIA IN RABBITS
A66-80643

CIRCULATORY AND RESPIRATORY REACTIONS IN DOGS TO DECOMPRESSION AND ARTIFICIAL AIR EMBOLISM
N66-17138

RESPIRATORY AND CIRCULATORY CHANGES IN DOGS DURING HIGH PRESSURE OXYGEN TOXICITY N66-17140

WEIGHTLESSNESS EFFECTS ON CIRCULATORY SYSTEM AND MUSCULAR ACTIVITY OF ANIMALS AND HUMANS DURING SPACE FLIGHTS
JPRS-34064 N66-18028

CIVIL AVIATION
CASE HISTORY OF MYOCARDIAL INFARCTION AFTER GASTROINTESTINAL ACUTE HEMORRHAGE IN COMMERCIAL PILOT A66-80571

CLINICAL MEDICINE
PHYSIOLOGICAL AND CLINICAL APPLICATIONS OF TRANSCUTANEOUS DOPPLER FLOWMETER APPLYING TRANSDUCER TO SKIN SURFACE OVER STRATEGIC SITES TO INDICATE BLOOD FLOW VELOCITY A66-80604

OPERATIONAL CAPABILITY AND PHYSIOLOGICAL AND CLINICAL APPLICATIONS OF TRANSCUTANEOUS ULTRASONIC BLOOD VELOCITY METER A66-80620

REPORTS FROM U.S.S.R. ACADEMY OF MEDICAL SCIENCES ON CORTICOSTEROIDS, STEROID HORMONES, DIABETES, THYROID GLAND AND PANCREAS DISEASES, AUTORADIOGRAPHY, AND ELECTROCARDIOGRAPHY
JPRS-33643 N66-16244

CLOSED ECOLOGICAL SYSTEM
LIFE SUPPORT CLOSED CYCLES FOR MISSIONS TO OUTER SPACE LASTING 12 MONTHS OR LONGER, CONSIDERING RECOVERY AND REPLENISHING OF WATER, FOOD AND OXYGEN FROM WASTES A66-17229

CODING
MEMORY SPAN WITH EFFICIENT CODING PROCEDURES IN HUMANS A66-80665

EFFECTS OF CONSPICUITY CODING ON TIME REQUIRED AND ERRORS MADE IN LOCATING UPDATED INFORMATION ON INDIVIDUAL AND GROUP COMMAND SYSTEM DISPLAYS
N66-16527

COLD WEATHER TESTING
HELICOPTER RECONNAISSANCE TACTICS FOR AIR CAVALRY UNITS DURING WINTER ENVIRONMENT
N66-16531

COLOR PERCEPTION
PRECISION OF COLOR DIFFERENCES DERIVED FROM MULTIDIMENSIONAL SCALING EXPERIMENT
A66-80672

FUNDAMENTAL RESPONSE CURVES OF NORMAL AND DEUTERANOMALOUS OBSERVER DERIVED FROM CHROMATIC ADAPTATION DATA A66-80680

COMMAND SYSTEM
EFFECTS OF CONSPICUITY CODING ON TIME REQUIRED AND ERRORS MADE IN LOCATING UPDATED INFORMATION ON INDIVIDUAL AND GROUP COMMAND SYSTEM DISPLAYS
N66-16527

COMPENSATORY TRACKING
TRACKING STUDY TO DETERMINE MAXIMUM CONTROL ELEMENT LAG AND MAXIMUM AND MINIMUM CONTROL SENSITIVITY TOLERATED IN MANUALLY CONTROLLED COMPENSATORY TRACKING TASK
NASA-TN-D-3242 N66-16548

COMPUTER METHOD
COMPUTATIONAL ANALYSIS EMPLOYING DIGITAL COMPUTERS TO EVALUATE HYPOXIC STRESS REACTIONS IN MAN
A66-17659

COMPUTER USE FOR HANDLING ADVANCED SYSTEMS HUMAN FACTORS TASK DATA
NASA-CR-70513 N66-18161

COMPUTER PROGRAM
COMPUTER PROGRAM TO SIMULATE SECOND ORDER SERVO SYSTEM DYNAMICS UNDER AUTOMATIC AND MANUAL CONTROL
NASA-CR-70340 N66-17082

COMPUTER PROGRAMMING
HEURISTIC PROGRAMMING, CYBERNETICS AND PSYCHOLOGY OF REASONING, AND AUTOMATION OF HUMAN INTELLECT
JPRS-34182 N66-18051

CONDITIONED RESPONSE
AMPLITUDE OF PHOTICALLY EVOKED POTENTIALS BY CONDITIONED STIMULUS IN CAT A66-80580

CONDITIONED RESPONSE BEHAVIOR OF DOGS UNDER ACUTE HYPOXIA N66-17149

CONFERENCE
HUMAN FACTORS RESEARCH AND DEVELOPMENT DEALING WITH COMMUNICATION AND CONTROL, RECONNAISSANCE, PERFORMANCE DECREMENT IN AIR MOBILITY, AND ARMY AVIATION PERSONNEL AND TRAINING - CONFERENCE
AD-456363 N66-16526

CONFERENCE ON PROBLEMS OF USING DEEP HYPOTHERMIA IN TREATING CLINICAL DEATH
JPRS-33971 N66-18094

CONTAMINATION
MICROORGANIC CONTAMINATION OF STAINLESS STEEL DUE TO HANDLING BY PERSONNEL
NASA-TM-X-55408 N66-17240

CONTINUUM FLOW
OXYGEN SYSTEM FOR CREW OF EXECUTIVE JET AIRCRAFT, USING CONTINUOUS FLOW OF OXYGEN, FIXED CAPACITY RESERVIOR, AND PROVIDING SAFETY PRESSURE
FPRC/MEMO-207 N66-18054

CONTROL SIMULATOR
CONTROL ANALOG VERTICAL ATTITUDE INDICATOR AND VTOL FLIGHT DISPLAY FOR HELICOPTER PILOT TRAINING N66-16536

CONVULSION
ADSORPTION CHANGES IN NERVOUS SYSTEM AND INTERNAL ORGANS OF MICE DURING OXYGEN-INDUCED CONVULSIONS N66-17144

HYPEROXEMIC AND HYPOXEMIC CONVULSION EFFECTS ON SUGAR, LACTIC ACID, AND INORGANIC PHOSPHORUS LEVELS IN DOG BLOOD AND SPINAL FLUID N66-17147

COPOLYMER
ONE-DIMENSIONAL ISING MODEL TO EXPLAIN MELTING TEMPERATURE LINEAR DEPENDENCE OF COPOLYMERIC D NA
BN-425 N66-17005

CORONARY CIRCULATION
NOREPINEPHRINE AND ANGIOTENSIN EFFECTS ON CORONARY FLOW AND MYOCARDIAL OXYGEN CONSUMPTION IN CAT A66-80635

HYPOXEMIA EFFECT ON CORONARY CIRCULATION AND HEART MUSCLE METABOLISM A66-80729

CORTICOSTEROID
REPORTS FROM U.S.S.R. ACADEMY OF MEDICAL SCIENCES ON CORTICOSTEROIDS, STEROID HORMONES, DIABETES, THYROID GLAND AND PANCREAS DISEASES, AUTORADIOGRAPHY, AND ELECTROCARDIOGRAPHY
JPRS-33643 N66-16244

COSMIC RADIATION
COSMIC RADIATION HAZARDS AND EFFECT ON MAN AND ANIMALS IN RELATION TO SOLAR ACTIVITY AND FLIGHT DURATION A66-80519

CRYSTAL STRUCTURE
PHYSICAL AND CHEMICAL PROPERTIES OF ALPHA-LACTALBUMIN CRYSTALS PREPARED FROM GOAT MILK N66-16363

CULTURE /BIOL/
EFFECTS OF LIGHT INTENSITY AND CULTURE DENSITY ON ALGAL OXYGEN PRODUCTION
NRL-6331 N66-16214

MATHEMATICAL DESCRIPTION OF CONTINUOUS CULTURING OF MICROALGAE
JPRS-33831 N66-16315

CUTANEOUS PERCEPTION
FUNCTIONAL ORGANIZATION OF HAIRY SKIN IN RESPONSE TO SENSORY STIMULI A66-80662

CYBERNETICS
HISTORICAL BACKGROUND AND APPLICATIONS OF CYBERNETICS WHICH PERMITS THEORY RELATING INFORMATION PROCESSING TO LEARNING, THINKING, AND UNDERSTANDING
P-3144 N66-16946

HEURISTIC PROGRAMMING, CYBERNETICS AND PSYCHOLOGY OF REASONING, AND AUTOMATION OF HUMAN INTELLECT
JPRS-34182 N66-18051

CYTOLOGY
PREPARATION, PROPERTIES, AND STORAGE STABILITY OF MACROMOLECULES LABELLED BY TRITIUM AND BY BIOLOGICAL SYNTHESIS - NUCLEIC ACIDS, LYSOZYME, AND RIBONUCLEASE
EUR-2419.F N66-16439

D

DARK ADAPTION
GLAREMITS MEASUREMENT BY CONE THRESHOLDS AND BY BLEACHING OF CONE PIGMENTS A66-80677

EFFECT OF WAVELENGTH AND BANDWIDTH OF RED LIGHT ON RECOVERY OF DARK ADAPTATION A66-80678

INDICATOR OF RAT*S RETINAL RECEPTOR RESPONSE - HISTOLOGICAL STAINING REACTION A66-80679

DATA PROCESSING
SOME ASPECTS OF BIOLOGICAL DATA ANALYSIS - LONGITUDINAL AND TRANSVERSE PROFILES OF RHYTHMS A66-80528

AUTOMATIC DATA PROCESSING IN PSYCHOPHYSIOLOGY - SYSTEM IN OPERATION A66-80638

DAZZLE PROJECT
VISUAL RECOVERY IN HUMANS FROM BRIEF EXPOSURES TO HIGH LUMINANCE A66-80674

DEATH
CONFERENCE ON PROBLEMS OF USING DEEP HYPOTHERMIA IN TREATING CLINICAL DEATH
JPRS-33971 N66-18094

DECISION MAKING
STUDY OF HUMAN CONTROL IN STOCHASTIC MULTISTAGE DECISION TASK A66-80636

THEORY OF GROUP DECISION BEHAVIOR TESTED ON DYADS A66-80637

DECOMPRESSION
CIRCULATORY EFFECTS OF CAROTID ARTERY STRETCH RECEPTORS STIMULATION IN MAN AT REST AND DURING EXERCISE A66-80555

SYNCOPE INDUCED BY APPLICATION OF NEGATIVE PRESSURE TO LOWER BODY AND EFFECT ON LUNG CARBON MONOXIDE DIFFUSING CAPACITY A66-80565

DECOMPRESSION AIR EMBOLIC PROCESS IN ANIMALS AND PHYSIOLOGICAL RESPONSES N66-17133

ARTIFICIAL AIR EMBOLISM AND DECOMPRESSION EFFECTS ON BLOOD OF DOGS N66-17136

CIRCULATORY AND RESPIRATORY REACTIONS IN DOGS TO DECOMPRESSION AND ARTIFICIAL AIR EMBOLISM N66-17138

ELECTRIC ANALOGY OF TISSUE GAS SATURATION UNDER SIMULATED DECOMPRESSION CONDITIONS N66-17139

DECOMPRESSION SICKNESS
DECOMPRESSION SICKNESS OF DOGS AS AFFECTED BY PLASMA REPLACEMENT BY DEXTRAN AND HYPOTHERMIA A66-80668

PHYSIOLOGICAL RESPONSES IN HUMANS AND ANIMALS TO AIR EMBOLISMS AND PRESSURE ENVIRONMENTS IN DECOMPRESSION SICKNESS STUDIES
NASA-TT-F-358 N66-17126

SUPERSATURATION OF ANIMALS AND HUMANS WITH GASES FOR DECOMPRESSION SICKNESS STUDIES N66-17129

PERMISSIBLE SUPERSATURATION VALUE AFTER INHALATION OF AIR-HELIUM-OXYGEN MIXTURES AND DECOMPRESSION SICKNESS SYMPTOMS N66-17130

ANIMAL STUDIES ON SUPERSATURATION WITH NITROGEN AND INCREASED BODY RESISTANCE TO DECOMPRESSION SICKNESS N66-17131

DECOMPRESSION SICKNESS PROVOCATION BY EXPOSING ANIMALS TO HIGH ALTITUDE PRESSURE AFTER DECOMPRESSION N66-17132

TEMPERATURE EFFECTS ON DECOMPRESSION SICKNESS AND AIR EMBOLISM IN ANIMALS N66-17137

TREATMENT OF SEVERE SPINAL FORM OF DECOMPRESSION SICKNESS N66-17161

DEHYDRATION
HEART RATE, OXYGEN CONSUMPTION, AND BODY TEMPERATURE AND WEIGHT OF DEHYDRATED SUBJECTS DURING EXERCISE IN HOT ENVIRONMENT A66-80617

DEHYDRATION AND WEIGHTLESSNESS IN MANNED SPACE FLIGHT N66-16428

DENSITOMETER
DETERMINING THICKNESS AND MINERAL CONTENT IN VERTEBRA AND OTHER BONES BY X-RAY AND OTHER DENSITOMETRY - APPLICATION OF TECHNIQUES TO HUMAN STUDIES
NASA-SP-64 N66-17666

THEORETICAL ASPECTS OF RADIOGRAPHIC DENSITOMETRY USED TO DETERMINE MINERAL CONTENT IN BONE N66-17667

QUANTITATIVE RADIOGRAPHY OF BONE MASS AND DENSITY MEASURED BY X-RAYS N66-17668

RADIOGRAPHIC BONE DENSITOMETRY FOR BONE MASS DETERMINATIONS IN OS CALCIS, MIDDLE PHALANX OF FIFTH DIGIT, AND PATELLA N66-17670

FACTORS AFFECTING RADIOGRAPHIC DENSITOMETRY OF LUMBAR SPINE AND FEMORAL NECK N66-17671

SOFT X-RAY-RADIATION FOR BONE DENSITOMETRY USING GAMMA RADIOISOTOPE SOURCE IN PRECISION X-RAY TUBE N66-17676

IODINE 125 FOR USE IN BONE DENSITOMETRY N66-17677

MEASUREMENTS OF BONE VOLUME AND VERTEBRAL DENSITY N66-17681

DEOXYRIBONUCLEIC ACID
DIURNAL VARIATION IN COLLAGEN RIBONUCLEIC ACID, DEOXYRIBONUCLEIC ACID, LACTATE, AND CALCIUM METABOLIC ACTIVITY OF RAT BONE TISSUE A66-80574

DEOXYRIBONUCLEIC ACID /DNA/
X-RAY AND GAMMA RAY EFFECTS ON DEOXYRIBONUCLEIC ACID /DNA/
EUR-2471.F N66-17938

DEPTH PERCEPTION
ROLE OF KNOWLEDGE IN DISTANCE PERCEPTION ON BINOCULAR OR MONOCULAR BASIS A66-80664

DESERT
BLOOD, PLASMA, AND RED CELL VOLUMES OF YOUNG AND OLD MEN DURING REST AND EXERCISE IN DESERT ENVIRONMENT AND AT HIGH ALTITUDE A66-80606

DIENCEPHALON
RELATION OF DIENCEPHALIC ALTERATIONS TO ELECTROENCEPHALOGRAM CORTICAL ACTIVITY AND SLEEP IN CATS A66-80694

DIET
OXYGEN CONSUMPTION AND SERUM LIPID LEVELS OF BABOON, PAPIO URSINUS, GIVEN SATURATED AND POLYUNSATURATED FAT DIETS A66-80710

INTERACTION OF DIETARY PROTEIN AND CALCIUM ON GROWTH AND MAINTENANCE OF BONES OF YOUNG, ADULT, AND AGED RATS A66-80711

DIGESTIVE SYSTEM
CHANGES IN ESOPHAGEAL PRESSURE TRANSMISSION DURING DETERMINATION OF LUNG COMPLIANCE IN DOGS A66-80593

RELATIONSHIP OF AIR FLOW TO ESOPHAGEAL PRESSURE DURING MAXIMAL RESPIRATORY EFFORT IN MAN A66-80596

DIGITAL COMPUTER
AUTOMATIC DATA PROCESSING IN PSYCHOPHYSIOLOGY - SYSTEM IN OPERATION A66-80638

DIGITAL SIMULATION
DIGITAL COMPUTER SIMULATION OF RESPIRATORY RESPONSE TO CEREBROSPINAL FLUID CARBON DIOXIDE TENSION OF CAT A66-80648

DISEASE
USEFULNESS AND LIMITATIONS OF NELSON TEST METHOD FOR SYPHILIS IN DETERMINING FLIGHT FITNESS IN PILOTS A66-80720

REPORTS FROM U.S.S.R. ACADEMY OF MEDICAL SCIENCES ON CORTICOSTEROIDS, STEROID HORMONES, DIABETES, THYROID GLAND AND PANCREAS DISEASES, AUTORADIOGRAPHY, AND ELECTROCARDIOGRAPHY
JPRS-33643 N66-16244

STRUCTURAL RELATION OF ABNORMAL CALCIFICATIONS WITH COLLAGEN MATRIX IN DISEASED HUMAN BONES - STUDY OF BONE DYSPLASIA BY X-RAY DIFFRACTION N66-16362

DISPLAY SYSTEM
PSYCHOLOGY AND DISPLAY SYSTEM DESIGN A66-80708

DIURNAL RHYTHM
DIURNAL VARIATION IN COLLAGEN RIBONUCLEIC ACID, DEOXYRIBONUCLEIC ACID, LACTATE, AND CALCIUM METABOLIC ACTIVITY OF RAT BONE TISSUE A66-80574

DIURNAL VARIATION
DIURNAL VARIATION IN PULMONARY DIFFUSING CAPACITY OF MAN FOR CARBON MONOXIDE A66-80603

NOCTURNAL BODY TEMPERATURE, SWEATING RATE, AND DEPTH OF SLEEP MONITORED BY ELECTRONCEPHALOGRAPHY A66-80610

DOG
SITE OF PULMONARY VASOMOTOR ACTIVITY DURING HYPOXIA OR SEROTONIN ADMINISTRATION IN DOGS A66-80554

PROTECTIVE EFFECT OF HYPERBARIC OXYGENATION IN CEREBRAL ANOXIA IN DOGS A66-80556

EFFECT OF BLOOD HYDROGEN ION CONCENTRATION ON HYPOXIC PULMONARY VASOCONSTRICTION IN DOGS A66-80586

CHANGES IN VENTILATION AND PULMONARY MECHANICS INDUCED BY HYPERTONIC SODIUM CHLORIDE IN DOGS A66-80587

OXYGEN PRESSURE VENTILATION RESPONSE CURVE WITH NORMAL HYDROGEN ION CONCENTRATION AND CARBON DIOXIDE PRESSURE IN DOGS A66-80592

CHANGES IN ESOPHAGEAL PRESSURE TRANSMISSION DURING DETERMINATION OF LUNG COMPLIANCE IN DOGS A66-80593

PULMONARY DIFFUSION AND CAPILLARY BLOOD VOLUME IN DOGS AT REST AND WITH EXERCISE A66-80600

ELECTRICAL ACTIVITY OF PHRENIC NERVE FROM RESPIRATORY CENTER OF DOG DURING OBSTRUCTED BREATHING A66-80601

REGIONAL BLOOD FLOW TO BRAIN, INTESTINE, AND HIND LIMB AND TOTAL BLOOD FLOW OF DOG BREATHING PURE OXYGEN A66-80605

CONVERSION OF GLUCOSIDE, ACETYL STROPHANTHIDIN, INDUCED VENTRICULAR TACHYCARDIA TO SINUS RHYTHM BY ETHYL ALCOHOL IN DOGS A66-80626

ELECTROMETRIC SURFACE PH OF ISCHEMIC KIDNEY AND EFFECT OF HYPOTHERMIA IN DOGS AND RABBITS A66-80629

RELATIVE EFFECT OF HYPOXIA AND HYPERCAPNIA ON ADRENAL MEDULLARY SECRETION IN ANESTHETIZED DOGS A66-80640

EFFECT OF COMBINED ACTION OF RADIOIODINE-131 AND

NOISE ON CARDIAC ACTIVITY IN DOGS
A66-80654

ABSORPTIVE CAPACITY OF INTESTINE AND STOMACH DURING WATER DEPRIVATION AND STARVATION IN DOGS
A66-80657

DECOMPRESSION SICKNESS OF DOGS AS AFFECTED BY PLASMA REPLACEMENT BY DEXTRAN AND HYPOTHERMIA
A66-80668

HYPOXEMIA EFFECT ON CORONARY CIRCULATION AND HEART MUSCLE METABOLISM A66-80729

EFFECT OF HIGH-FREQUENCY VIBRATIONS ON ABSORPTION OF RADIOACTIVE PHOSPHORUS IN INTESTINE, IN DOGS
A66-80744

DOSIMETRY
SOLID CHEMICAL SYSTEM FOR CHARGED PARTICLE DOSIMETRY
NASA-CR-70462 N66-17481

RADIATION DOSIMETRY OF PERSONNEL AT NUCLEAR FACILITIES
AE-211 N66-18133

SLOW NEUTRON CALIBRATION OF FILM AND GAMMA DOSIMETERS
AERE-R-4960 N66-18214

DROSOPHILA
MECHANISM OF ENTRAINMENT OF CIRCADIAN RHYTHM BY LIGHT CYCLES USING DROSOPHILA PUPAL ECLOSION RHYTHM AS MODEL A66-80539

TOXICITY INTERACTIONS OF HIGH PRESSURE OXYGEN AND X-RAYS ON DROSOPHILA A66-80732

EFFECT OF TRITIATED THYMIDINE AND GAMMA RADIATION ON MORTALITY OF DROSOPHILA MELANOGASTER LARVAE
CNAEM-16 N66-18103

DRUG
SHIFT IN CIRCADIAN RHYTHM PHASES IN CANARY, SERINUS CANARIUS, IN SELF-SELECTION, IMPOSED DARKNESS, AND AFTER ADMINISTRATION OF RESERPINE AND TRIIODOTHYRONINE A66-80543

DECOMPRESSION SICKNESS OF DOGS AS AFFECTED BY PLASMA REPLACEMENT BY DEXTRAN AND HYPOTHERMIA
A66-80668

EXPERIMENTS WITH ANTIHYPEROXIC PHARMACOPROTECTION IN RATS A66-80715

DRY HEAT
DRY HEAT EFFECTIVENESS IN MICROORGANISM STERILIZATION AT 105 DEG C FOR SPACE PROBE APPLICATIONS
NASA-CR-70321 N66-17088

DYNAMIC PROGRAMMING
STUDY OF HUMAN CONTROL IN STOCHASTIC MULTISTAGE DECISION TASK A66-80636

E

EAR
CUTANEOUS VASCULAR AND SWEATING RESPONSES TO TYMPANIC AND SKIN TEMPERATURES IN NUDE SUBJECTS
A66-80609

PITCH DISCRIMINATION AT HIGH FREQUENCIES BY AIR AND BONE CONDUCTION A66-80663

EARTH
NUTRITIONAL RESOURCES AND THEIR UTILIZATION ON EARTH WITH ASPECTS PERTINENT TO BIOASTRONAUTICS
A66-80659

EARTH RADIATION
SHIELDING OF ASTRONAUTS FROM ELECTRONS AND BREMSSTRAHLUNG IN EARTH RADIATION BELTS
A66-80739

EJECTION SEAT
TOLERANCE TO SPINNING IN EJECTION ESCAPE
A66-80561

ELECTRIC ANALOGY
ELECTRIC ANALOGY OF TISSUE GAS SATURATION UNDER SIMULATED DECOMPRESSION CONDITIONS
N66-17139

ELECTRIC IMPULSE
BASIC PRINCIPLES OF STIMULATED ELECTROAUDITORY PERCEPTION N66-16819

ELECTRIC STIMULUS
ELECTRIC SPARK STIMULATION OF SKIN FOR STUDY OF SINGLE SENSORY UNITS
AD-624848 N66-17120

ELECTROCARDIOGRAM
EFFECT OF COMBINED ACTION OF RADIOIODINE-131 AND NOISE ON CARDIAC ACTIVITY IN DOGS
A66-80654

ELECTROCARDIOGRAPHIC STUDY AND COURSE OF ARTERIAL PRESSURE AT VARIOUS BODY POSITIONS ON TILTING TABLE A66-80712

VARIATIONS OF P-WAVE OF ELECTROCARDIOGRAM IN RELATION TO CHANGES OF BODY POSITION
A66-80713

COURSE OF P-WAVE IN RELATION TO BODY POSITION IN RABBIT - PRESSORECEPTOR EFFECT A66-80714

CONSTRAINT PLATFORM AND BIOTELEMETRY MODULE FOR HUMAN BALLISTOCARDIOGRAM AND ELECTROCARDIOGRAM IN ZERO GRAVITY ENVIRONMENT
NASA-CR-69828 N66-16283

ELECTROCARDIOGRAPHY
REPORTS FROM U.S.S.R. ACADEMY OF MEDICAL SCIENCES ON CORTICOSTEROIDS, STEROID HORMONES, DIABETES, THYROID GLAND AND PANCREAS DISEASES, AUTORADIOGRAPHY, AND ELECTROCARDIOGRAPHY
JPRS-33643 N66-16244

ELECTROCUTANEOUS COMMUNICATION
ELECTROCUTANEOUS SIGNALS USED WITH AUDITORY AND VISUAL STIMULI TO PROVIDE ALERTING AND WARNING SIGNS FOR RECEPTION OF MILITARY INFORMATION
N66-16529

ELECTRODERMAL RESPONSE
GALVANIC SKIN RESPONSE, HEART RATE, AND MUSCLE ACTION BIOELECTRIC POTENTIAL SIGNALS AS PSYCHOPHYSIOLOGICAL RESPONSE TO LEARNING TASK DIFFICULTY
NAVTRADEVCEN-IH-34 N66-16639

FEASIBILITY OF MULTIPLE BID-ELECTRODE ARRAYS TO SENSOR GALVANIC SKIN RESPONSE SIGNALS DURING BODY MOVEMENT
NASA-CR-70532 N66-18068

ELECTROENCEPHALOGRAM
BASIC PATTERNS AND VARIATIONS IN ELECTROCARDIOGRAPHIC RECORDS OF 37 SUBJECTS DURING NORMAL ACTIVITY OVER FOUR YEAR PERIOD
A66-80627

ELECTROENCEPHALOGRAM /EEG/
EXPERIMENTS WITH RATS UNDER ANESTHESIA SUBJECTED TO ACCELERATION, NOTING ELECTROENCEPHALOGRAMS
A66-19085

CHANGES IN PATTERNS OF HUMAN ELECTROENCEPHALOGRAM DURING FLUCTUATIONS OF PERCEPTION OF STABILIZED RETINAL IMAGE A66-80579

NOCTURNAL BODY TEMPERATURE, SWEATING RATE, AND DEPTH OF SLEEP MONITORED BY ELECTRONCEPHALOGRAPHY
A66-80610

NEUROHUMORAL SLEEP TRANSMISSION IN RABBIT
A66-80690

RELATION OF ELECTROENCEPHALOGRAM TO BRAIN CORTEX METABOLISM IN MAMMALS A66-80691

RELATION OF DIENCEPHALIC ALTERATIONS TO ELECTROENCEPHALOGRAM CORTICAL ACTIVITY AND SLEEP IN CATS A66-80694

SHIFTS OF CEREBRAL CORTICAL STEADY POTENTIAL DURING SLEEP A66-80698

CIRCULATION OF CEREBRAL CORTEX AND ARTERIAL BLOOD PRESSURE CORRELATION WITH ELECTROENCEPHALOGRAM OF RAPID EYE MOVEMENT STATE A66-80699

CORRELATION OF ELECTROENCEPHALOGRAM WITH PUPIL AND EYELID BEHAVIOR, VISUAL ACCOMMODATION, AND OCULAR MOVEMENTS DURING SLEEP A66-80701

CEREBRAL CORTEX AND SUBCORTEX RELATIONSHIPS IN CHIMPANZEE DURING SLEEP, WAKEFULNESS, AND RAPID EYE MOVEMENT STATE A66-80704

CORTICAL ACTIVITY DURING SLEEP AND WAKEFULNESS IN CATS A66-80706

RELATIONSHIP OF PULMONARY VENTILATION AND CARBON DIOXIDE TENSION TO SLEEP AND WAKEFULNESS LEVELS RECORDED BY ELECTROENCEPHALOGRAM IN HUMANS A66-80707

ELECTROENCEPHALOGRAMS OF EXPERIENCED PILOTS, PILOT CANDIDATES, AND NON-PILOTS A66-80719

HUMAN ELECTROENCEPHALOGRAM GENERATOR SPECTRAL ANALYSIS IN POSTERIOR CEREBRAL REGIONS
NASA-CR-57050 N66-18389

ELECTROLYTE
SOLID ELECTROLYTE CARBON DIOXIDE REDUCTION SYSTEM FOR SUBORBITAL FLIGHT
AMRL-TR-65-153 N66-16643

ELECTROLYTE METABOLISM
AMELIORATIVE VALUE OF CARBOHYDRATE AND ELECTROLYTES TO SURVIVAL OF FASTING HUMAN SUBJECTS IN ARCTIC A66-80613

ELECTROMYOGRAM
SCALENE AND STERNOMASTOID MUSCLE FUNCTION AND RESPIRATION IN HUMANS A66-80597

ELECTRON MICROSCOPY
IONIZING RADIATION EFFECT ON SUBMICROSCOPIC STRUCTURES OF IRRADIATED FROGS AND RESULTING ALTERATIONS IN METABOLIC FUNCTIONS
COO-1080-1 N66-17943

ELECTRON PHOTOGRAPHY
HIGH ENERGY ELECTRON PHOTOGRAPHIC ISODOSE MEASUREMENTS IN INHOMOGENEOUS MEDIA
CONF-640918-2 N66-17546

ELECTRONYSTAGMOGRAPHY
PERFORMANCE OF IMPLANTED ELECTRODE FOR ELECTRO-NYSTAGMOGRAPHY IN SQUIRREL MONKEY A66-80621

IMPORTANCE IN PILOT TRAINING AND EVALUATION OF INDUCED NYSTAGMUS IN SUBJECTS WITH SPONTANEOUS NYSTAGMUS - DIFFERENTIATION OF TYPES OF NYSTAGMUS WITH ELECTRONYSTAGMOGRAPHY A66-80716

ELECTROPHYSIOLOGY
BIOELECTRICITY HISTORICAL REVIEW AND PRINCIPLES OF MEMBRANE POTENTIAL - ELECTROPHYSIOLOGY
BNL-9337 N66-17175

THERMODYNAMIC PRINCIPLES OF ION TRANSFER ACROSS MEMBRANES FOR NUTRIENT AND EXCREMENT FLOW IN BIOLOGICAL SYSTEM - ELECTROPHYSIOLOGY
BNL-9338 N66-17176

EMBOLISM
DECOMPRESSION AIR EMBOLIC PROCESS IN ANIMALS AND PHYSIOLOGICAL RESPONSES N66-17133

PHYSIOLOGICAL RESPONSES IN RABBITS TO ARTIFICIAL EMBOLISM DUE TO INJECTIONS OF CARBON DIOXIDE, OXYGEN, AIR, AND HELIUM-OXYGEN MIXTURE N66-17134

INCREASED TOLERANCE TO AIR EMBOLISM IN ANIMALS BY REPEATED INJECTIONS N66-17135

ARTIFICIAL AIR EMBOLISM AND DECOMPRESSION EFFECTS ON BLOOD OF DOGS N66-17136

TEMPERATURE EFFECTS ON DECOMPRESSION SICKNESS AND AIR EMBOLISM IN ANIMALS N66-17137

CIRCULATORY AND RESPIRATORY REACTIONS IN DOGS TO DECOMPRESSION AND ARTIFICIAL AIR EMBOLISM N66-17138

EFFECT OF OXYGEN BREATHING IN RESORPTION OF GAS EMBOLISM IN VASCULAR SYSTEM OF CATS AND ON COURSE OF PULMONARY PRESSURE TRAUMA N66-17154

EMBRYO
PHYSIOLOGICAL RESPONSE OF GERM CELLS IN FLOWER BEETLES, TRIBOLIUM CASTANEUM, TO X-RAY IRRADIATION
HW-SA-3747 N66-17833

ENDOCRINE SYSTEM
ROLE OF ENDOCRINE AND CENTRAL NERVOUS SYSTEMS IN VARIOUS BIOLOGICAL RHYTHMS IN INSECTS, CRUSTACEANS AND VERTEBRATES CONCERNING METABOLISM A66-80534

ENDOCRINE SYSTEM OF MALE AND FEMALE RATS AS AFFECTED BY VIBRATIONAL STRESS A66-80566

ROLE OF PITUITARY AND ADRENAL GLANDS IN GENESIS OF AND RECOVERY FROM RADIATION PATHOLOGICAL SYMPTOMS
JPRS-34120 N66-17623

ENDOLYMPH
EFFECTS OF STREPTOMYCIN SULFATE IN TREATMENT OF ENDOLYMPHATIC HYDROPS - MENIERES DISEASE
NASA-CR-69862 N66-16446

ENERGY EXCHANGE
CONSIDERATION OF ERRORS IN STUDY OF CIRCADIAN RHYTHMS IN ENERGY METABOLISM A66-80515

ENERGY REQUIREMENT
HEART RATE, VENTILATORY VOLUME, OXYGEN COMSUMPTION AND ENERGY EXPENDITURE OF MEN BEFORE, DURING, AND AFTER CLIMBING A66-80687

ENERGY EXPENDITURE, METABOLIC HEAT PRODUCTION AND OXYGEN CONSUMPTION, AND WORK CAPACITY OF MEN CLOTHED IN SPACE SUITS N66-17395

ENVIRONMENT
ENVIRONMENT CONCEPT AS PSYCHOLOGICAL FACTOR, AND PERTINENT LITERATURE REVIEW
TR-33 N66-16507

ENVIRONMENT SIMULATION
BACILLUS SPORE GERMINATION IN SIMULATED MARTIAN ENVIRONMENT
NASA-CR-70524 N66-18088

ENVIRONMENTAL TEMPERATURE
POLAROGRAPHIC MEASUREMENT OF BLOOD OXYGEN TENSION AS AFFECTED BY PH, HEPARIN, HEMATOCRIT AND ENVIRONMENTAL TEMPERATURE A66-80623

ECOLOGICAL AND SEASONAL VARIATIONS OF SKIN TEMPERATURE IN MAN A66-80736

ENVIRONMENTAL TESTING
L F AND INFRASONIC NOISE EFFECTS ON MANS CARDIAC RHYTHM, HEARING, VISION, MOTOR CONTROL, SPATIAL ORIENTATION, SPEECH AND SUBJECTIVE TOLERANCE A66-17656

METABOLIC RATES IN PRESSURIZED PRESSURE SUIT, AFFECTING HEAT BALANCE OF SUBJECTS METABOLIC HEAT WITH HEAT REMOVED BY ENVIRONMENTAL CONTROL A66-17657

RATS EXPOSED TO SPACE CABIN ATMOSPHERE FOR TWO WEEKS, NOTING MORTALITY RATE, ORGANISM FUNCTIONING, GROWTH RATE, ETC A66-17663

ENZYME
ANOMERIC SPECIFICITY OF YEAST GALACTOKINASE BY CHROMATOGRAPHIC METHODS
NASA-TM-X-56057 N66-17218

ENZYME ACTIVITY
ENZYME SUBSTRATE - RNA-RIBONUCLEASE AND SUCCINATE-CYTOCHROME C REDUCTASE - REACTIONS IN HIGH MAGNETIC FIELDS A66-80645

QUALITATIVE AND QUANTITATIVE TEST FOR ENZYME ACTIVITIES IN TERRESTRIAL SOIL ADAPTED TO MARS PROBE TELEMETRY PROCEDURES
NASA-CR-70058 N66-18163

EPINEPHRINE
EFFECT OF STARVATION AND PROLONGED EXERCISE ON FATTY ACID COMPOSITION IN ADIPOSE TISSUE AND EFFECT OF ADRENALIN ON COMPOSITION OF FATTY ACIDS RELEASED BY ADIPOSE TISSUE IN VITRO IN RATS A66-80651

EQUILIBRIUM
ONE-DIMENSIONAL ISING MODEL TO EXPLAIN MELTING TEMPERATURE LINEAR DEPENDENCE OF COPOLYMERIC D NA
BN-425 N66-17005

EQUIPMENT SPECIFICATIONS
BODY MEASUREMENTS OF PILOTS MADE DURING ANTHROPOMETRIC SURVEY - APPLICATIONS TO EQUIPMENT DESIGN N66-16534

ERYTHROCYTE
CELL AND SOLUTION VELOCITY CONSTANTS FOR REACTION TO FORM CARBOXYHEMOGLOBIN AT DIFFERENT TEMPERATURES RED BLOOD CELL SIZE A66-80557

BLOOD, PLASMA, AND RED CELL VOLUMES OF YOUNG AND OLD MEN DURING REST AND EXERCISE IN DESERT ENVIRONMENT AND AT HIGH ALTITUDE A66-80606

EFFECT OF ADRENALECTOMY ON ADAPTATION TO HYPOXIA IN RATS - CHANGES IN HAEMOGLOBIN CONCENTRATION AND OSMOTIC RESISTANCE OF ERYTHROCYTES IN PERIPHERAL BLOOD A66-80652

HEMATOPOIETIC CHANGES IN DIFFERENT ANIMALS AFTER X-IRRADIATION AS COMPARED WITH ANALOGOUS CHANGES IN MAN A66-80724

ESCAPE
TOLERANCE TO SPINNING IN EJECTION ESCAPE A66-80561

ETHYL ALCOHOL
CONVERSION OF GLUCOSIDE, ACETYL STROPHANTHIDIN, INDUCED VENTRICULAR TACHYCARDIA TO SINUS RHYTHM BY ETHYL ALCOHOL IN DOGS A66-80626

INFLUNCE OF MODERATE ALCOHOLEMIC VALUES ON SOME ASPECTS OF PSYCHOMOTOR REACTIVITY A66-80727

EVACUATION
MEDICAL USE OF HELICOPTERS AND GENEVA CONVENTION A66-80725

EVOLUTION
SYNTHESIS FRAMEWORK OF EXPERIMENT PROGRAM FOR ORBITING RESEARCH LABORATORIES APPLIED TO BIOSCIENCE FOR DETERMINATION OF ORIGIN, NATURE, AND EVOLUTION OF LIFE
NASA-CR-70342, VOL. B, PT. XII N66-17058

EXCRETION
DEFECT OF URINARY ACIDIFICATION DURING FASTING IN MAN A66-80631

INFLUENCE OF POSTURE AND DIURNAL RHYTHM ON RENAL EXCRETION OF ACID IN NORMAL MEN AND ADRENALECTOMIZED PATIENTS A66-80632

EFFECT OF INFANTILE FEEDING RATE ON BODY WEIGHT LOSS, NITROGEN EXCRETION, AND SURVIVAL TIME DURING SUBSEQUENT EXPOSURE TO STARVATION, IN RATS A66-80653

EXPERIMENT DESIGN
SYNTHESIS FRAMEWORK OF EXPERIMENT PROGRAM FOR ORBITING RESEARCH LABORATORIES APPLIED TO BIOMEDICINE/BEHAVIOR TO ASSURE PHYSIOLOGICAL SAFETY ON ADVANCED SPACE MISSIONS
NASA-CR-70356 N66-17053

SYNTHESIS FRAMEWORK OF EXPERIMENT PROGRAM FOR ORBITING RESEARCH LABORATORIES APPLIED TO BIOSCIENCE FOR DETERMINATION OF ORIGIN, NATURE, AND EVOLUTION OF LIFE
NASA-CR-70342, VOL. B, PT. XII N66-17058

EXTRATERRESTRIAL ENVIRONMENT
BACILLUS SPORE GERMINATION IN SIMULATED MARTIAN ENVIRONMENT
NASA-CR-70524 N66-18088

EXTRATERRESTRIAL LIFE
EXTRATERRESTRIAL LIFE DETECTION AND LIFE SUPPORT SYSTEMS IN MANNED SPACE TRAVEL, NOTING ELECTRONIC EQUIPMENT NECESSARY FOR IT A66-18727

LIFE ON MARS - CONDITIONS, POSSIBLE TYPES OF ORGANISMS AND THEORIES OF ADVANCED FORMS OF LIFE A66-80582

PHYSICAL CHARACTERISTICS OF UNIVERSE AND BIOGENESIS OF EXTRATERRESTRIAL LIFE A66-80742

ANNOTATED BIBLIOGRAPHY ON EXTRATERRESTRIAL LIFE
NASA-SP-7015 N66-16566

DEFINITIONS OF LIFE ON EARTH, AND HABITABILITY OF OTHER PLANETS IN UNIVERSE
JPRS-34259 N66-18064

EXTRAVEHICULAR OPERATION
EXTRAVEHICULAR MOBILITY UNIT / EMU/ TO BE WORN BY ASTRONAUTS ON APOLLO LUNAR LANDING MISSION A66-18584

PORTABLE LIFE SUPPORT SYSTEM AND PRESSURIZED SUIT FOR EXTRAVEHICULAR MOBILITY UNIT TO PROTECT MAN AGAINST LUNAR SURFACE AND FREE SPACE HAZARDS N66-17387

EYE
CORRELATION OF ELECTROENCEPHALOGRAM WITH PUPIL AND EYELID BEHAVIOR, VISUAL ACCOMMODATION, AND OCULAR MOVEMENTS DURING SLEEP A66-80701

EYE DOMINANCE
INDIVIDUAL VARIATIONS IN POSTOCULAR LINES OF REGARD A66-80666

EYE MOVEMENT
INFLUENCE OF EYE LID MOVEMENT UPON ELECTRO-OCULOGRAPHIC RECORDING OF VERTICAL SACCADIC EYE MOVEMENTS A66-17662

EYE MOVEMENTS OF WAKING NORMAL SUBJECTS AND SCHIZOPHRENICS WITH CLOSED EYES A66-80661

CEREBRAL CORTEX AND SUBCORTEX RELATIONSHIPS IN CHIMPANZEE DURING SLEEP, WAKEFULNESS, AND RAPID EYE MOVEMENT STATE A66-80704

F

FATTY ACID
EFFECT OF STARVATION AND PROLONGED EXERCISE ON FATTY ACID COMPOSITION IN ADIPOSE TISSUE AND EFFECT OF ADRENALIN ON COMPOSITION OF FATTY ACIDS RELEASED BY ADIPOSE TISSUE IN VITRO IN RATS A66-80651

EFFECT OF STARVATION ON FATTY ACID COMPOSITION OF MYOCARDIUM IN RATS A66-80684

FEEDBACK CONTROL SYSTEM
AIR TRAFFIC CONTROL INCIDENT REPORTING SYSTEM DESIGN TO MAXIMIZE CORRECTIVE FEEDBACK
AM-65-10 N66-16583

FETUS
BIOSATELLITE FOR TV MONITORING OF DEVELOPMENT OF OPOSSUM EMBRYONIC FETUS IN SPACE ENVIRONMENT A66-18583

FIGHTER AIRCRAFT
MAN-MACHINE CONFLICT IN HIGH PERFORMANCE TACTICAL FIGHTER A66-17282

FILM
SLOW NEUTRON CALIBRATION OF FILM AND GAMMA DOSIMETERS
AERE-R-4960 N66-18214

FINGER
RADIOGRAPHIC BONE DENSITOMETRY FOR BONE MASS DETERMINATIONS IN OS CALCIS, MIDDLE PHALANX OF FIFTH DIGIT, AND PATELLA N66-17670

MINERAL CONTENT OF BONE CORTEX RELATED TO THICKNESS IN SECOND METACARPAL AS A FUNCTION OF AGE AND SEX N66-17673

FIXED-WING AIRCRAFT
TECHNIQUE FOR PERFORMING MISSION ANALYSIS ON FIXED AND ROTARY WING AIRCRAFT N66-16538

FLICKER FUSION FREQUENCY
EFFECT OF EXTREMES IN MAGNETIC ENVIRONMENT ON PHYSIOLOGICAL BEHAVIOR A66-18585

FLIGHT ALTITUDE
TREE-TOP ALTITUDE NAVIGATION FOR RECONNAISSANCE MISSION - ROLE OF AIRCRAFT TYPE, MISSION LENGTH, ILLUMINATION, WEATHER, AND CREW EXPERIENCE N66-16532

FLIGHT CLOTHING
SPACE SUIT DEVELOPMENT STATUS
NASA-TN-D-3291 N66-16942

SHOULDER SLOPE ANGLE OF FLYING PERSONNEL FOR IMPROVED SHOULDER HARNESS
AM-65-14 N66-17297

FLIGHT CONTROL
VISUAL AID IN DETECTION, RECOGNITION AND ACQUISITION OF TARGETS AT DIFFERENT ALTITUDES AND SPEEDS A66-17285

FLIGHT CREW OXYGEN EQUIPMENT DEVELOPED FOR VC 10 TRANSPORT AIRCRAFT
FPRC/MEMO-208 N66-18055

FLIGHT FATIGUE
THERAPEUTIC USE OF ACETYLASPARTIC ACID-CITRULLINE PREPARATION IN FLIGHT FATIGUE DURING SPORT FLYING A66-80721

FLIGHT FITNESS
USEFULNESS AND LIMITATIONS OF NELSON TEST METHOD FOR SYPHILIS IN DETERMINING FLIGHT FITNESS IN PILOTS A66-80720

FLIGHT SIMULATION
VISUAL SIMULATION FOR AIRCRAFT AND SPACE FLIGHT TRAINERS A66-80511

AVIATOR PERFORMANCE IN LIGHT WEAPONS HELICOPTER DURING NAP-OF-EARTH FLIGHT SIMULATED COMBAT MISSION N66-16533

POWERED TRIM CHANGES AFFECTING PILOT DURING SIMULATED LANDING FOR SHORT TAKE OFF AND LANDING AIRCRAFT
NASA-TN-D-3246 N66-16550

FLIGHT SIMULATOR
MARINE PILOT TRAINING TO DEVELOP VISUAL HABIT PATTERNS AS AID IN REDUCING MID-AIR COLLISION HAZARDS A66-17712

REVISION IN CINEMA METHOD IMPROVES GEOGRAPHIC ORIENTATION IN AIRCRAFT PILOTS DURING SIMULATED LOW ALTITUDE FLIGHT
TR-751-5 N66-17587

FLIGHT TRAINING
VALIDITY OF BRIEF VESTIBULAR DISORIENTATION TEST IN SCREENING PILOT TRAINEES A66-80559

PSYCHOLOGICAL AND PHYSIOLOGICAL TESTING IN SUCCESS PREDICTION IN FLIGHT TRAINING PROGRAMS
NASA-CR-69895 N66-16192

FLOW METER
PHYSIOLOGICAL AND CLINICAL APPLICATIONS OF TRANSCUTANEOUS DOPPLER FLOWMETER APPLYING TRANSDUCER TO SKIN SURFACE OVER STRATEGIC SITES TO INDICATE BLOOD FLOW VELOCITY A66-80604

OPERATIONAL CAPABILITY AND PHYSIOLOGICAL AND CLINICAL APPLICATIONS OF TRANSCUTANEOUS ULTRASONIC BLOOD VELOCITY METER A66-80620

FLYING PERSONNEL
CASE HISTORY OF MYOCARDIAL INFARCTION AFTER GASTROINTESTINAL ACUTE HEMORRHAGE IN COMMERCIAL PILOT A66-80571

EVALUATION OF HEARING LOSS AND VESTIBULAR DAMAGE IN PILOTS AND AIR FORCE PERSONNEL A66-80717

PREDICTION FORMULAE FOR PERSONNEL SELECTION BASED ON PROCUREMENT SOURCE AND SUCCESS OF OFFICER FLIGHT STUDENTS
AD-623826 N66-16503

ARMY AVIATION CAREER PROGRAM AND AVIATOR PERSONNEL REQUIREMENTS THROUGH 1968 N66-16542

SHOULDER SLOPE ANGLE OF FLYING PERSONNEL FOR IMPROVED SHOULDER HARNESS
AM-65-14 N66-17297

FOOD
NUTRITIONAL RESOURCES AND THEIR UTILIZATION ON EARTH WITH ASPECTS PERTINENT TO BIOASTRONAUTICS A66-80659

ALGAE GROWTH EXPERIMENTS AND APPLICATIONS - SPACE FLIGHT NUTRITION, FOOD, AND AGRICULTURE
JPRS-34012 N66-16499

VITAMIN CONTENT, NUTRITIONAL VALUE, AND AMINO ACID COMPOSITION OF EGG WHITE AFTER LONG TERM STORAGE AT ROOM TEMPERATURE
R-2089 N66-18072

FOOD INTAKE
HEAT, FOOD INTAKE, AND AGING EFFECTS ON THYROID FUNCTION OF MALE RATS A66-80619

EFFECT OF INFANTILE FEEDING RATE ON BODY WEIGHT LOSS, NITROGEN EXCRETION, AND SURVIVAL TIME DURING SUBSEQUENT EXPOSURE TO STARVATION, IN RATS A66-80653

FOURIER TRANSFORM
PROPOSED CEREBRAL CORTEX DUPLICATION OF FOURIER OPTICAL TRANSFORM PROCESS AND SPACIAL FILTERING - MATHEMATICAL MODEL
GE/EE/65-18 N66-16986

FREE FALL
HIGH FREE-FALL INJURIES - ANALYSIS OF FIFTY-THREE CASES A66-80634

FREQUENCY ANALYSIS
ACCURACY OF GEOPHYSICAL RHYTHMS AND FREQUENCY ANALYSIS A66-80524

FREQUENCY DISTRIBUTION
MEASUREMENT OF MUSCLE TREMOR FREQUENCY DISTRIBUTION ASSOCIATED WITH HAND-HELD FIELD GLASSES AND RESOLUTION EFFECTS A66-80576

FRICTIONLESS ENVIRONMENT
PRESSURIZED SPACE SUIT EFFECTS ON HUMAN PERFORMANCE IN FRICTIONLESS ENVIRONMENT N66-17392

FUNCTION TEST
METHODS FOR EVALUATION OF PHYSICAL FITNESS A66-80730

G

GALACTOKINASE
ANOMERIC SPECIFICITY OF YEAST GALACTOKINASE BY CHROMATOGRAPHIC METHODS
NASA-TM-X-56057 N66-17218

GAMMA RADIATION
U SAF WHOLE BODY GAMMA SPECTROMETRY IN SUPPORT OF AIR FORCE AEROSPACE MISSION A66-17664

SOFT X-RAY-RADIATION FOR BONE DENSITOMETRY USING GAMMA RADIOISOTOPE SOURCE IN PRECISION X-RAY TUBE N66-17676

X-RAY AND GAMMA RAY EFFECTS ON DEOXYRIBONUCLEIC ACID /DNA/
EUR-2471.F N66-17938

GAMMA RADIATION EFFECTS ON CHIMAERAS OF FRUIT TREES
EUR-2546.F N66-18070

EFFECT OF TRITIATED THYMIDINE AND GAMMA RADIATION ON MORTALITY OF DROSOPHILA MELANOGASTER LARVAE
CNAEM-16 N66-18103

SLOW NEUTRON CALIBRATION OF FILM AND GAMMA DOSIMETERS
AERE-R-4960 N66-18214

GAS CHROMATOGRAPHY
OPTICAL PROPERTIES OF AMINO ACIDS USING MASS SPECTROMETRY AND GAS CHROMATOGRAPHY
AFOSR-65-1632 N66-16516

GAS EXPANSION
EFFECT OF GAS EXPANSION IN GASTROINTESTINAL TRACT DURING BAROMETRIC PRESSURE CHANGES ON RESPIRATORY AND CARDIOVASCULAR REFLEXES N66-17159

GAS-LIQUID INTERACTION
SUPERSATURATION COEFFICIENT AND DISSOLVED GAS TENSION RELATION IN GAS-LIQUID INTERACTION AT HIGH PRESSURES N66-17128

GAS MIXTURE
PERMISSIBLE SUPERSATURATION VALUE AFTER INHALATION OF AIR-HELIUM-OXYGEN MIXTURES AND DECOMPRESSION SICKNESS SYMPTOMS N66-17130

GAS PRESSURE
INCREASED CARBON DIOXIDE CONTENT EFFECT ON ANIMAL BREATHING IN GAS PRESSURE CHAMBER N66-17151

TREATMENT OF PULMONARY PRESSURE TRAUMA BY REMOVAL OF EXCESS GAS FROM INTERPLEURAL CAVITIES N66-17155

RECOMPRESSION TREATMENT OF INTRAPULMONARY PRESSURE TRAUMA N66-17160

GASTROINTESTINAL SYSTEM
CASE HISTORY OF MYOCARDIAL INFARCTION AFTER GASTROINTESTINAL ACUTE HEMORRHAGE IN COMMERCIAL PILOT A66-80571

NEW THERAPY OF MOTION SICKNESS DECREASING GASTROINTESTINAL MOTILITY USING BETHANECHOL CHLORIDE A66-80572

ABSORPTIVE CAPACITY OF INTESTINE AND STOMACH DURING WATER DEPRIVATION AND STARVATION IN DOGS A66-80657

GASTROINTESTINAL TRACT
EFFECT OF GAS EXPANSION IN GASTROINTESTINAL TRACT DURING BAROMETRIC PRESSURE CHANGES ON RESPIRATORY AND CARDIOVASCULAR REFLEXES N66-17159

GEMINI PROJECT
ASTRONAUT SELECTION AND CREW PREPARATION PROCEDURES FOR GEMINI AND APOLLO PROGRAMS A66-18578

EFFICACY OF CARDIOVASCULAR CONDITIONING WITH PULSATILE LEG CUFF TECHNIQUE IN DECREASING ORTHOSTATIC HYPOTENSION OF GEMINI V ASTRONAUTS N66-18012

EVALUATION OF PHYSICAL CONDITION OF GEMINI V ASTRONAUTS BY CARDIOVASCULAR SYSTEM RESPONSE TO CALIBRATED WORK LOAD N66-18013

EFFECT OF WEIGHTLESSNESS AND IMMOBILIZATION ON BONE DEMINERALIZATION OF PRIMARY AND BACKUP GEMINI V CREW USING RADIOGRAPHIC BONE DENSITOMETRY N66-18014

GEMINI SPACECRAFT
PREFLIGHT, IN-FLIGHT, AND POSTFLIGHT TESTS OF VISUAL ACUITY AND CAPABILITY OF GEMINI V CREW MEMBERS N66-18011

GENETICS
GAMMA RADIATION EFFECTS ON CHIMAERAS OF FRUIT TREES
EUR-2546.F N66-18070

PRODUCTION OF TOBACCO PLANT MUTANTS RESISTANT TO BLUE MOLD DISEASE BY SEED TREATMENT WITH IONIZING RADIATION - LITERATURE SURVEY
CNAEM-18 N66-18147

GEOPHYSICS
ACCURACY OF GEOPHYSICAL RHYTHMS AND FREQUENCY ANALYSIS A66-80524

GERMINATION
BACILLUS SPORE GERMINATION IN SIMULATED MARTIAN ENVIRONMENT
NASA-CR-70524 N66-18088

GLARE
GLAREMITS MEASUREMENT BY CONE THRESHOLDS AND BY BLEACHING OF CONE PIGMENTS A66-80677

EFFECTS OF HIGH LUMINANCE SOURCES UPON VISIBILITY OF POINT SOURCES
NASA-TM-X-56561 N66-18332

GLUCOSE
AVOIDANCE LEARNING, BLOOD GLUCOSE LEVEL, BODY WEIGHT, AND PROTEIN BOUND IODINE OF RAT EXPOSED TO COLD STRESS AND HABENULAR LESION A66-80614

PERMEABILITY MEASUREMENTS FOR DIFFUSION OF CARBON DIOXIDE AND GLUCOSE THROUGH SILICON RUBBER AND TEFLON IN STUDY OF ENZYMATIC BREAKDOWN PRODUCTS SEPARATION
NASA-CR-70190 N66-16968

GLUCOSIDE
CONVERSION OF GLUCOSIDE, ACETYL STROPHANTHIDIN, INDUCED VENTRICULAR TACHYCARDIA TO SINUS RHYTHM BY ETHYL ALCOHOL IN DOGS A66-80626

GOAT
PHYSICAL AND CHEMICAL PROPERTIES OF ALPHA-LACTALBUMIN CRYSTALS PREPARED FROM GOAT MILK N66-16363

GRAVITATIONAL EFFECT
NEUROLOGIC ADAPTATIONS AND AUDIOGENIC RESPONSES IN MICE EXPOSED TO CHRONIC 2 X GRAVITY FIELD, NOTING DEVELOPMENT OF MORE EFFICIENT CIRCULATORY SYSTEM, GROWTH PATTERN ALTERATIONS, ETC A66-17660

EXPERIMENTS WITH ANESTHESIZED DOGS SUBJECTED TO G ACCELERATIONS, OBSERVING BEHAVIOR OF ARTERIAL OXYGEN SATURATION AND PULMONARY VENTILATION DURING SHORT PERIODS A66-19083

EXPERIMENTS WITH RATS UNDER ANESTHESIA SUBJECTED TO ACCELERATION, NOTING ELECTROENCEPHALOGRAMS A66-19085

GROUP BEHAVIOR
THEORY OF GROUP DECISION BEHAVIOR TESTED ON DYADS A66-80637

INTERPERSONAL EXCHANGE IN ISOLATION A66-80641

GROWTH
EFFECTS OF ADAPTATION OF MICE TO COLD ON REPRODUCTION AND GROWTH A66-80521

HYPOTHESIS TO EXPLAIN INHIBITING EFFECT OF MAGNETIC FIELDS ON CELL GROWTH RATE A66-80647

INTERACTION OF DIETARY PROTEIN AND CALCIUM ON GROWTH AND MAINTENANCE OF BONES OF YOUNG, ADULT, AND AGED RATS A66-80711

H

HABITABILITY
DEFINITIONS OF LIFE ON EARTH, AND HABITABILITY OF OTHER PLANETS IN UNIVERSE
JPRS-34259 N66-18064

HAND
FUNCTIONAL EXTENSION OF HUMAN HANDS THROUGH REMOTE CONTROL MACHINE
NASA-CR-69856 N66-16394

AGE ASSOCIATED BONE LOSS MEASUREMENTS IN HANDS OF THREE RACES N66-17685

HANDLING
MICROORGANIC CONTAMINATION OF STAINLESS STEEL DUE TO HANDLING BY PERSONNEL
NASA-TM-X-55408 N66-17240

HARDWARE
MISSION, PERSONNEL, AND HARDWARE DEMANDS OF LOW ALTITUDE NAVIGATION N66-16541

HAZARD
SPACE FLIGHT HAZARDS - SURVEY OF PRESENT PROBLEMS IN MANNED SPACE FLIGHT A66-80628

HEAD MOVEMENT
INTERACTIONS BETWEEN OPTOKINETIC AND VESTIBULO-OCULAR RESPONSES DURING HEAD ROTATION IN VARIOUS PLANES A66-80568

HEALTH
HEALTH HAZARDS IN HANDLING AND PROCESSING BERYLLIUM AND ITS COMPOUNDS, NOTING EFFECT ON LUNGS AND REVIEWING AEC RECOMMENDATIONS A66-18854

HEARING LOSS
EVALUATION OF HEARING LOSS AND VESTIBULAR DAMAGE IN PILOTS AND AIR FORCE PERSONNEL A66-80717

EFFECTS OF STREPTOMYCIN SULFATE IN TREATMENT OF ENDOLYMPHATIC HYDROPS - MENIERES DISEASE
NASA-CR-69862 N66-16446

HEART
RESISTANCE OF MYOCARDIUM TO ANOXIA IN RATS ACCLIMATIZED TO HIGH ALTITUDE SIMULATION A66-80649

EFFECT OF STARVATION ON FATTY ACID COMPOSITION OF MYOCARDIUM IN RATS A66-80684

HYPOXEMIA EFFECT ON CORONARY CIRCULATION AND HEART MUSCLE METABOLISM A66-80729

HEART DISEASE
CASE HISTORY OF MYOCARDIAL INFARCTION AFTER GASTROINTESTINAL ACUTE HEMORRHAGE IN COMMERCIAL PILOT A66-80571

HEART FUNCTION
VENTILATION, OXYGEN CONSUMPTION, CARDIAC OUTPUT, AND HEART RATE OF ATHLETIC AND NONATHLETIC SUBJECTS EXERCISING AT THREE LEVELS BEFORE AND AFTER TRAINING A66-80607

CARDIAC OUTPUT IN MAN AT REST AND AT WORK DURING AND AFTER ACCLIMATIZATION TO 3,800 METERS A66-80608

EFFECT OF DURATION OF ANOXIA, FREQUENCY OF STIMULATION, AND TEMPERATURE ON CONTRACTIBILITY OF MYOCARDIUM DAMAGED BY ANOXIA IN RATS A66-80650

USE OF METHODS OF CORRELATION ANALYSIS FOR STUDY OF TELEMETRIC DATA OF CARDIOVASCULAR SYSTEM RESPONSES DURING FLIGHT OF VOSKHOD I SPACECRAFT A66-80745

RENAL BLOOD FLOW AND EXTRACELLULAR VOLUME, RENAL AND CARDIAC EFFECTS ON SODIUM EXCRETION, AND ABNORMAL CIRCULATORY STATE EFFECTS ON CARDIAC RATE AND BLOOD PRESSURE - DOG & HUMAN PHYSIOLOGY
NASA-CR-70316 N66-17072

HEART ACTIVITY DURING HIGH PRESSURE OXYGEN TOXICITY IN DOGS AND GUINEA PIGS N66-17142

HEART RATE
PULMONARY DIFFUSING CAPACITY AND CARDIOVASCULAR RESPONSE IN MAN AS AFFECTED BY APPREHENSION A66-80602

HEART RATE, OXYGEN CONSUMPTION, AND BODY TEMPERATURE AND WEIGHT OF DEHYDRATED SUBJECTS DURING EXERCISE IN HOT ENVIRONMENT A66-80617

HEART RATE, VENTILATORY VOLUME, OXYGEN COMSUMPTION AND ENERGY EXPENDITURE OF MEN BEFORE, DURING, AND AFTER CLIMBING A66-80687

GALVANIC SKIN RESPONSE, HEART RATE, AND MUSCLE ACTION BIOELECTRIC POTENTIAL SIGNALS AS PSYCHOPHYSIOLOGICAL RESPONSE TO LEARNING TASK DIFFICULTY
NAVTRADEVCEN-IH-34 N66-16639

ROLE OF VAGUS NERVES IN CIRCULATORY AND RESPIRATORY REACTIONS DURING INCREASED INTRAPULMONARY PRESSURE N66-17158

HEAT ACCLIMATIZATION
ROLE OF PHYSICAL CONDITIONING IN ACCLIMATIZATION OF HUMAN SUBJECTS WORKING IN HUMID HEAT A66-80612

TIME FOR ACCLIMATIZATION OF HEALTHY YOUNG EXERCISING MEN TO HOT, WET ENVIRONMENT A66-80616

HEAT BALANCE
METABOLIC RATES IN PRESSURIZED PRESSURE SUIT, AFFECTING HEAT BALANCE OF SUBJECTS METABOLIC HEAT WITH HEAT REMOVED BY ENVIRONMENTAL CONTROL A66-17657

HEAT RESISTANCE
RESISTANCE EVALUATION OF NATURAL SOURCE SPORE ISOLATES TO INACTIVATION BY THERMAL SHOCK
NASA-CR-70029 N66-16712

HELICOPTER
AIRCRAFT ACCIDENTS AND DISORIENTATION EXPERIENCES OF ARMY HELICOPTER PILOTS AS RELATED TO TRAINING AND INSTRUMENT DESIGN A66-80563

MEDICAL USE OF HELICOPTERS AND GENEVA CONVENTION A66-80725

HELICOPTER CONTROL
AVIATOR PERFORMANCE IN LIGHT WEAPONS HELICOPTER DURING NAP-OF-EARTH FLIGHT SIMULATED COMBAT MISSION N66-16533

CONTROL ANALOG VERTICAL ATTITUDE INDICATOR AND VTOL FLIGHT DISPLAY FOR HELICOPTER PILOT TRAINING N66-16536

CYCLIC GRIP FOR HELICOPTER CONTROL - HUMAN ENGINEERING DESIGN STUDY N66-16537

HELICOPTER PERFORMANCE
HELICOPTER RECONNAISSANCE TACTICS FOR AIR CAVALRY UNITS DURING WINTER ENVIRONMENT N66-16531

HELIUM
THERMOREGULATION IN MICE AND HELIUM-OXYGEN ATMOSPHERE CONDUCTIVITY A66-80681

PERMISSIBLE SUPERSATURATION COEFFICIENT IN HUMANS BREATHING AIR AND OXYGEN-HELIUM MIXTURE IN PRESSURE CHAMBER N66-17127

HEMATOCRIT
POLAROGRAPHIC MEASUREMENT OF BLOOD OXYGEN TENSION AS AFFECTED BY PH, HEPARIN, HEMATOCRIT AND

ENVIRONMENTAL TEMPERATURE A66-80623

HEMODYNAMIC RESPONSE
LONG TERM HEMODYNAMIC CHANGES IN DOGS UNDER HIGH PARTIAL PRESSURE OF OXYGEN N66-17146

ROLE OF PROPRIOCEPTIVE IMPULSES DURING RESPIRATION WITH INCREASED INTRAPULMONARY PRESSURE IN REGULATING RESPIRATION AND CIRCULATION N66-17156

CHANGES IN CAROTID SINUS PRESSOR AND DEPRESSOR REFLEXES DURING RESPIRATION UNDER INCREASED INTRAPULMONARY PRESSURE N66-17157

ROLE OF VAGUS NERVES IN CIRCULATORY AND RESPIRATORY REACTIONS DURING INCREASED INTRAPULMONARY PRESSURE N66-17158

EVALUATION OF PHYSICAL CONDITION OF GEMINI V ASTRONAUTS BY CARDIOVASCULAR SYSTEM RESPONSE TO CALIBRATED WORK LOAD N66-18013

HEMOGLOBIN
CELL AND SOLUTION VELOCITY CONSTANTS FOR REACTION TO FORM CARBOXYHEMOGLOBIN AT DIFFERENT TEMPERATURES RED BLOOD CELL SIZE A66-80557

MOSSBAUER EFFECT IN FE57 STUDYING HEMOGLOBIN, OXYHEMOGLOBIN, CARBOHEMOGLOBIN, CARBOXYHEMOGLOBIN, HEMIN, AND HEME OF HUMAN AND RAT BLOOD A66-80646

EFFECT OF ADRENALECTOMY ON ADAPTATION TO HYPOXIA IN RATS - CHANGES IN HAEMOGLOBIN CONCENTRATION AND OSMOTIC RESISTANCE OF ERYTHROCYTES IN PERIPHERAL BLOOD A66-80652

HEMORRHAGE
CASE HISTORY OF MYOCARDIAL INFARCTION AFTER GASTROINTESTINAL ACUTE HEMORRHAGE IN COMMERCIAL PILOT A66-80571

HEPARIN
POLAROGRAPHIC MEASUREMENT OF BLOOD OXYGEN TENSION AS AFFECTED BY PH, HEPARIN, HEMATOCRIT AND ENVIRONMENTAL TEMPERATURE A66-80623

HIBERNATION
PERSISTENCE OF CIRCADIAN RHYTHM IN HIBERNATING RODENTS A66-80540

HIGH ALTITUDE
PRACTICAL AND PHYSIOLOGICAL ASPECTS OF GIVING ANESTHESIA AT HIGH ALTITUDES A66-80510

BLOOD, PLASMA, AND RED CELL VOLUMES OF YOUNG AND OLD MEN DURING REST AND EXERCISE IN DESERT ENVIRONMENT AND AT HIGH ALTITUDE A66-80606

URINARY BLADDER CALCULI FORMED AT HIGH ALTITUDE IN RATS A66-80670

HIGH ALTITUDE ENVIRONMENT
PHYSIOLOGY OF CHRONIC ADAPTATION TO HIGH ELEVATIONS - ACCLIMIZATION
JPRS-33871 N66-16325

HIGH ALTITUDE PRESSURE
DECOMPRESSION SICKNESS PROVOCATION BY EXPOSING ANIMALS TO HIGH ALTITUDE PRESSURE AFTER DECOMPRESSION N66-17132

HIGH ENERGY ELECTRON
HIGH ENERGY ELECTRON PHOTOGRAPHIC ISODOSE MEASUREMENTS IN INHOMOGENEOUS MEDIA
CONF-640918-2 N66-17546

HIGH PRESSURE OXYGEN
EXPERIMENTS WITH ANTIHYPEROXIC PHARMACOPROTECTION IN RATS A66-80715

TOXICITY INTERACTIONS OF HIGH PRESSURE OXYGEN AND X-RAYS ON DROSOPHILA A66-80732

RESPIRATORY AND CIRCULATORY CHANGES IN DOGS DURING HIGH PRESSURE OXYGEN TOXICITY N66-17140

PATHOLOGICAL CHARACTERISTICS AND MECHANISM OF PULMONARY INVOLVEMENT IN HIGH PRESSURE OXYGEN TOXICITY IN GUINEA PIGS AND DOGS N66-17141

HEART ACTIVITY DURING HIGH PRESSURE OXYGEN TOXICITY IN DOGS AND GUINEA PIGS N66-17142

CIRCULATING BLOOD VOLUME CHANGES IN DOGS BREATHING OXYGEN UNDER PRESSURE N66-17143

HIGH SPEED FLYING
TASK LOADING EFFECTS ON PILOT PERFORMANCE DURING SIMULATED LOW ALTITUDE, HIGH SPEED, TERRAIN FOLLOWING MISSIONS N66-16540

HIGH TEMPERATURE ENVIRONMENT
PLASMA AND SWEAT HISTAMINE CONCENTRATIONS OF HUMAN SUBJECTS AFTER HEAT EXPOSURE AND PHYSICAL EXERCISE A66-80611

AVOIDANCE LEARNING, BLOOD GLUCOSE LEVEL, BODY WEIGHT, AND PROTEIN BOUND IODINE OF RAT EXPOSED TO COLD STRESS AND HABENULAR LESION A66-80614

HEART RATE, OXYGEN CONSUMPTION, AND BODY TEMPERATURE AND WEIGHT OF DEHYDRATED SUBJECTS DURING EXERCISE IN HOT ENVIRONMENT A66-80617

HEAT, FOOD INTAKE, AND AGING EFFECTS ON THYROID FUNCTION OF MALE RATS A66-80619

CONCENTRATION AND DILUTION OF URINE IN PERMANENT INHABITANTS AT REST AND EXERCISE IN HOT ENVIRONMENT AS RELATED TO FLUID INTAKE A66-80685

REVIEW OF STUDIES INVESTIGATING POSSIBLIITY THAT MAN IN HOT CLIMATE MAY ADAPT TO WATER DEPRIVATION A66-80686

HISTAMINE
PLASMA AND SWEAT HISTAMINE CONCENTRATIONS OF HUMAN SUBJECTS AFTER HEAT EXPOSURE AND PHYSICAL EXERCISE A66-80611

HISTOLOGY
INDICATOR OF RAT*S RETINAL RECEPTOR RESPONSE - HISTOLOGICAL STAINING REACTION A66-80679

HISTORY
HISTORICAL BACKGROUND AND APPLICATIONS OF CYBERNETICS WHICH PERMITS THEORY RELATING INFORMATION PROCESSING TO LEARNING, THINKING, AND UNDERSTANDING
P-3144 N66-16946

BIOELECTRICITY HISTORICAL REVIEW AND PRINCIPLES OF MEMBRANE POTENTIAL - ELECTROPHYSIOLOGY
BNL-9337 N66-17175

HORMONE
NEUROHUMORAL SLEEP TRANSMISSION IN RABBIT A66-80690

MAXIMAL RESISTANCE DURING ALTITUDE SIMULATION TO ACUTE HYPOXIA IN MICE TREATED WITH CORTISONE, TESTOSTERONE, AND SOMATOTROPIC HORMONE A66-80723

CIRCADIAN CYCLE OF URINARY HYDROCORTISONE IN HEALTHY SUBJECTS AND PATIENTS WITH CUSHING*S SYNDROME A66-80733

EXTRACTS OF CHLORELLA CELLS AS GROWTH FACTOR OF PROTOZOAN TETRAHYMENA PYRIFORMIS, A66-80735

REPORTS FROM U.S.S.R. ACADEMY OF MEDICAL SCIENCES ON CORTICOSTEROIDS, STEROID HORMONES, DIABETES, THYROID GLAND AND PANCREAS DISEASES, AUTORADIOGRAPHY, AND ELECTROCARDIOGRAPHY
JPRS-33643 N66-16244

ESTROGENS USED IN POSTMENOPAUSAL OSTEOPOROSIS TO

RETARD LOSS IN BONE MASS N66-17682

HUMAN
PRINCIPLES AND RELATIONSHIPS TO REGULATIVE PROCESSES IN HUMANS - OXYGEN DEFICIENCY TESTS
NASA-TT-F-9737 N66-16574

PERMISSIBLE SUPERSATURATION COEFFICIENT IN HUMANS BREATHING AIR AND OXYGEN-HELIUM MIXTURE IN PRESSURE CHAMBER N66-17127

SUPERSATURATION OF ANIMALS AND HUMANS WITH GASES FOR DECOMPRESSION SICKNESS STUDIES N66-17129

HUMAN BEHAVIOR
NEUROPHYSIOLOGICAL ASPECTS OF MANNED SPACE FLIGHT IN RELATION TO BEHAVIOR AND ILLUSIONS A66-80518

UNCERTAINTY, IMPORTANCE, AND AROUSAL AS DETERMINANTS OF PRE-DECISIONAL INFORMATION SEARCH A66-80747

PERCEPTUAL REFERENCE FRAME EVALUATION, AND PHYSIOLOGICAL RESPONSES TO UNUSUAL ENVIRONMENTS, AUDITORY SIGNALS, STRUCTURELESS VISUAL FIELD EXPOSURE, AND STIMULI
AD-623869 N66-16506

ENVIRONMENT CONCEPT AS PSYCHOLOGICAL FACTOR, AND PERTINENT LITERATURE REVIEW
TR-33 N66-16507

RELATIONAL DETERMINATION OF BEHAVIOR, AND SIGNIFICANT RELATIONSHIPS BETWEEN RESPONSE VARIABLES AND BEHAVIORALLY EFFECTIVE PROPERTIES OF STIMULI
TR-35 N66-16509

SELF-REPORTED SYMPTOM INCIDENCE OF AIR TRAFFIC CONTROL PERSONNEL
AM-65-5 N66-16584

SYNTHESIS FRAMEWORK OF EXPERIMENT PROGRAM FOR ORBITING RESEARCH LABORATORIES APPLIED TO BIOMEDICINE/BEHAVIOR TO ASSURE PHYSIOLOGICAL SAFETY ON ADVANCED SPACE MISSIONS
NASA-CR-70356 N66-17053

HUMAN BODY
EVALUATION OF INTERNAL RADIATION DOSES - EFFECTIVE ENERGY OF ABSORBED RADIONUCLIDES AS FUNCTION OF HUMAN AGE
CEA-R-2809 N66-16222

STRUCTURAL RELATION OF ABNORMAL CALCIFICATIONS WITH COLLAGEN MATRIX IN DISEASED HUMAN BONES - STUDY OF BONE DYSPLASIA BY X-RAY DIFFRACTION N66-16362

HUMAN BODY ADAPTIVE REACTION TO INCREASED AIR PRESSURE BASED ON HIGHER NERVOUS SYSTEM STUDY N66-17152

DETERMINING THICKNESS AND MINERAL CONTENT IN VERTEBRA AND OTHER BONES BY X-RAY AND OTHER DENSITOMETRY - APPLICATION OF TECHNIQUES TO HUMAN STUDIES
NASA-SP-64 N66-17666

AUTORADIOGRAPHIC METHOD USED FOR STUDIES OF GRANULOCYTOPOIESIS IN MAN
BNL-7955 N66-18287

HUMAN ELECTROENCEPHALOGRAM GENERATOR SPECTRAL ANALYSIS IN POSTERIOR CEREBRAL REGIONS
NASA-CR-57050 N66-18389

HUMAN CENTRIFUGE
HUMAN CENTRIFUGE STUDIES OF RELATIVE EFFECTIVENESS OF ANTIMOTION SICKNESS DRUGS, INCLUDING HYOSCINE D-AMPHETAMINE, MECLIZINE, CHLORPROMAZINE, THIETHYLPERAZINE, PROCHLORPERAZINE, AND TRIMETHOBENZAMIDE A66-80573

HUMAN ENGINEERING
PSYCHOLOGY AND DISPLAY SYSTEM DESIGN A66-80708

FUNCTIONAL EXTENSION OF HUMAN HANDS THROUGH REMOTE CONTROL MACHINE
NASA-CR-69856 N66-16394

HUMAN ENGINEERING AND PERFORMANCE CONSIDERATIONS IN SPACECRAFT DESIGN AND SPACE FLIGHT MISSIONS N66-16429

BODY MEASUREMENTS OF PILOTS MADE DURING ANTHROPOMETRIC SURVEY - APPLICATIONS TO EQUIPMENT DESIGN N66-16534

CYCLIC GRIP FOR HELICOPTER CONTROL - HUMAN ENGINEERING DESIGN STUDY N66-16537

REGENERATIVE WASTE DISPOSAL SYSTEM SUPPLYING PHYSIOLOGICAL REQUIREMENTS FOR HUMANS IN SPACE CRAFT
PB-168787 N66-17429

HUMAN FACTOR
PSYCHOLOGY AND DISPLAY SYSTEM DESIGN A66-80708

HUMAN FACTORS RESEARCH AND DEVELOPMENT DEALING WITH COMMUNICATION AND CONTROL, RECONNAISSANCE, PERFORMANCE DECREMENT IN AIR MOBILITY, AND ARMY AVIATION PERSONNEL AND TRAINING - CONFERENCE
AD-456363 N66-16526

EFFECTS OF CONSPICUITY CODING ON TIME REQUIRED AND ERRORS MADE IN LOCATING UPDATED INFORMATION ON INDIVIDUAL AND GROUP COMMAND SYSTEM DISPLAYS N66-16527

RIGHTS AND ERRORS KEYS AS REFERENCE SYSTEM FOR IMAGE INTERPRETATION BY HUMAN OPERATORS N66-16528

COMPUTER USE FOR HANDLING ADVANCED SYSTEMS HUMAN FACTORS TASK DATA
NASA-CR-70513 N66-18161

HUMAN PATHOLOGY
STRUCTURAL RELATION OF ABNORMAL CALCIFICATIONS WITH COLLAGEN MATRIX IN DISEASED HUMAN BONES - STUDY OF BONE DYSPLASIA BY X-RAY DIFFRACTION N66-16362

HUMAN PERFORMANCE
FIELD CRITERION TEST TO ASSESS SCANNING AND TARGET IDENTIFICATION SKILLS OF COMBAT ARMS OFFICERS N66-16530

HUMAN PERFORMANCE AND BEHAVIOR ASSESSMENT IN AIR FORCE SYSTEMS AND SUBSYSTEMS
SSD-65-172/514/R N66-16664

VESTIBULAR DISORIENTATION TEST VALIDITY IN SCREENING PILOT TRAINEES
NASA-CR-70306 N66-17079

COMPUTER PROGRAM TO SIMULATE SECOND ORDER SERVO SYSTEM DYNAMICS UNDER AUTOMATIC AND MANUAL CONTROL
NASA-CR-70340 N66-17082

HUMAN PERFORMANCE IN PRESSURIZED SUITS UNDER ZERO GRAVITY CONDITIONS N66-17388

MAINTENANCE OF SPACE VEHICLES DURING SHORT PERIODS OF SIMULATED WEIGHTLESSNESS BY WORKERS WEARING PRESSURIZED SUITS N66-17389

COMPARISON OF TIME REQUIRED TO REMOVE AND REPLACE SPACECRAFT RADIOS UNDER SIMULATED WEIGHTLESSNESS ON DRY LAND AND UNDERWATER N66-17391

PRESSURIZED SPACE SUIT EFFECTS ON HUMAN PERFORMANCE IN FRICTIONLESS ENVIRONMENT N66-17392

OUTPUT CHARACTERISTICS, PERFORMANCE DECREMENT FROM WEARING PRESSURIZED SUITS, AND LIFE SUPPORT REQUIREMENTS IN SPACE ENVIRONMENT N66-17393

PHYSIOLOGICAL ENERGY EXPENDITURE FROM DONNING FULL PRESSURE SUIT UNDER SPACE AND TIME

LIMITATIONS N66-17394

EFFECT OF PROLONGED WEIGHTLESSNESS ON OTOLITH FUNCTION AND HORIZONTALITY MEASUREMENTS IN ABSENCE OF GRAVITY AND VISUAL CUES N66-18015

HUMAN REACTION
LITERATURE REVIEW OF HUMAN REACTIONS TO STRUCTURELESS VISUAL FIELD EXPOSURE
TR-34 N66-16508

RESPONSE LATENCY CHANGES FOLLOWING SIGNAL PITCH SHIFTS, AND ADAPTATION-LEVEL THEORY EVALUATION
TR-36 N66-16510

WHOLE-BODY HUMAN RESPONSE TO RANDOM AND SINUSOIDAL VIBRATION AT VARIOUS MODES N66-16535

EFFECTS OF CHANGING LOCATION OF VISUAL STIMULI ON SIMPLE REACTION TIMES OF ADULTS WITH NORMAL VISION N66-16539

PSYCHOPHYSIOLOGICAL RESPONSES IN HUMANS TO LOW FREQUENCY PRESSURE OSCILLATIONS
NASA-TN-D-3323 N66-18432

HUMAN TOLERANCE
L F AND INFRASONIC NOISE EFFECTS ON MANS CARDIAC RHYTHM, HEARING, VISION, MOTOR CONTROL, SPATIAL ORIENTATION, SPEECH AND SUBJECTIVE TOLERANCE A66-17656

HUMIDITY
ROLE OF PHYSICAL CONDITIONING IN ACCLIMATIZATION OF HUMAN SUBJECTS WORKING IN HUMID HEAT A66-80612

TIME FOR ACCLIMATIZATION OF HEALTHY YOUNG EXERCISING MEN TO HOT, WET ENVIRONMENT A66-80616

ECOLOGICAL AND SEASONAL VARIATIONS OF SKIN TEMPERATURE IN MAN A66-80736

HYPERCAPNIA
RELATIVE EFFECT OF HYPOXIA AND HYPERCAPNIA ON ADRENAL MEDULLARY SECRETION IN ANESTHETIZED DOGS A66-80640

HYPEROXIA
EXPERIMENTS WITH ANTIHYPEROXIC PHARMACOPROTECTION IN RATS A66-80715

LONG TERM HEMODYNAMIC CHANGES IN DOGS UNDER HIGH PARTIAL PRESSURE OF OXYGEN N66-17146

HYPEROXEMIC AND HYPOXEMIC CONVULSION EFFECTS ON SUGAR, LACTIC ACID, AND INORGANIC PHOSPHORUS LEVELS IN DOG BLOOD AND SPINAL FLUID N66-17147

HYPERTENSIN
NOREPINEPHRINE AND ANGIOTENSIN EFFECTS ON CORONARY FLOW AND MYOCARDIAL OXYGEN CONSUMPTION IN CAT A66-80635

HYPERTHERMIA
DINITROPHENOL-INDUCED HYPERTHERMIA UNDER ALTERED PARTIAL PRESSURES OF OXYGEN AND CARBON DIOXIDE N66-17150

HYPERVENTILATION
NATURE OF VIBRATION HYPERVENTILATION IN MAN. A66-80590

POSTHYPERVENTILATION APNEA IN AWAKE MAN A66-80591

HYPOTHALAMUS
HYPOTHALAMIC CONTROL OF SLEEP MECHANISM IN CATS A66-80696

HYPOTHERMIA
ELECTROMETRIC SURFACE PH OF ISCHEMIC KIDNEY AND EFFECT OF HYPOTHERMIA IN DOGS AND RABBITS A66-80629

DECOMPRESSION SICKNESS OF DOGS AS AFFECTED BY PLASMA REPLACEMENT BY DEXTRAN AND HYPOTHERMIA A66-80668

POSSIBLE APPLICATION OF HYPOTHERMIA STATE FOR LONG PERIODS OF SPACE FLIGHT
JPRS-34093 N66-18036

CONFERENCE ON PROBLEMS OF USING DEEP HYPOTHERMIA IN TREATING CLINICAL DEATH
JPRS-33971 N66-18094

HYPOXIA
COMPUTATIONAL ANALYSIS EMPLOYING DIGITAL COMPUTERS TO EVALUATE HYPOXIC STRESS REACTIONS IN MAN A66-17659

CARBON DIOXIDE INDUCED MILD HYPOXIA, CORRECTION OF ALTERATIONS ON PERFORMANCE OF PSYCHOLOGIC AND PSYCHOMOTOR SYSTEMS A66-17661

CYTOPLASMIC ALTERATIONS AND FAT VACUOLE FORMATION IN PNEUMOCYTES OF GUINEA PIGS EXPOSED TO SEVERE HYPOXIA IN LOW PRESSURE CHAMBER A66-18769

SITE OF PULMONARY VASOMOTOR ACTIVITY DURING HYPOXIA OR SEROTONIN ADMINISTRATION IN DOGS A66-80554

EFFECT OF BLOOD HYDROGEN ION CONCENTRATION ON HYPOXIC PULMONARY VASOCONSTRICTION IN DOGS A66-80586

VENTILATORY RESPONSE TO HYPOXIA AND CARBON DIOXIDE FOLLOWING CARBON DIOXIDE EXPOSURE AND SODIUM BICARBONATE INGESTION IN MAN A66-80588

RELATIVE EFFECT OF HYPOXIA AND HYPERCAPNIA ON ADRENAL MEDULLARY SECRETION IN ANESTHETIZED DOGS A66-80640

ROLE OF SYMPATHETIC NERVOUS SYSTEM IN CIRCULATORY RESPONSE TO ARTERIAL HYPOXIA IN RABBITS A66-80643

EFFECT OF ADRENALECTOMY ON ADAPTATION TO HYPOXIA IN RATS - CHANGES IN HAEMOGLOBIN CONCENTRATION AND OSMOTIC RESISTANCE OF ERYTHROCYTES IN PERIPHERAL BLOOD A66-80652

ROLE OF HIGHER NERVOUS SYSTEM IN MECHANISM OF INTERACTION OF RESPIRATORY AND VASOMOTOR CENTERS DURING DEVELOPMENT OF HEMIC HYPOXIA AND FUNCTIONAL RESTORATION A66-80658

PROTECTION FROM IONIZING RADIATION UNDER HYPOXIC CONDITIONS IN PLANTS AND ANIMALS A66-80682

MAXIMAL RESISTANCE DURING ALTITUDE SIMULATION TO ACUTE HYPOXIA IN MICE TREATED WITH CORTISONE, TESTOSTERONE, AND SOMATOTROPIC HORMONE A66-80723

HYPOXEMIA EFFECT ON CORONARY CIRCULATION AND HEART MUSCLE METABOLISM A66-80729

LIFE SHORTENING IN MICE EXPOSED TO X-RAY IRRADIATION IN RELATION TO AGE AND HYPOXIA A66-80731

HYPEROXEMIC AND HYPOXEMIC CONVULSION EFFECTS ON SUGAR, LACTIC ACID, AND INORGANIC PHOSPHORUS LEVELS IN DOG BLOOD AND SPINAL FLUID N66-17147

CONDITIONED RESPONSE BEHAVIOR OF DOGS UNDER ACUTE HYPOXIA N66-17149

I

ILLUMINATION
TREE-TOP ALTITUDE NAVIGATION FOR RECONNAISSANCE MISSION - ROLE OF AIRCRAFT TYPE, MISSION LENGTH, ILLUMINATION, WEATHER, AND CREW EXPERIENCE N66-16532

ILLUSION
NEUROPHYSIOLOGICAL ASPECTS OF MANNED SPACE FLIGHT

IN RELATION TO BEHAVIOR AND ILLUSIONS
A66-80518

IMAGE
RIGHTS AND ERRORS KEYS AS REFERENCE SYSTEM FOR IMAGE INTERPRETATION BY HUMAN OPERATORS
N66-16528

IMMERSION
SIZE CONSTANCY EFFECT DURING UNDERWATER IMMERSION
A66-80552

ORTHOSTATIC TOLERANCE AS AFFECTED BY WATER IMMERSION AND BED REST WITH OR WITHOUT PHYSICAL ACTIVITY
A66-80558

IMMUNOLOGY
IMMUNOLOGIC PROBLEMS OF SPACE BIOLOGY AND MEDICINE
JPRS-33922
N66-16324

INDUCTION
EFFECT OF ACETYLCHOLINE, ESERINE, ATROPINE, AND CARBACHOL ON SLEEP INDUCTION PATH IN BRAIN IN CATS
A66-80692

INDUSTRY
PERCUTANEOUS TOXICITY IN ANIMALS AND RELATED INDUSTRIAL HAZARDS IN RARE EARTH PROCESSING
TID-22294
N66-17950

INFECTION
HYPERBARIC OXYGEN EFFECT ON MICRORGANISMS IN VITRO AND IN LIVE MICE GIVEN INFECTIOUS INJECTIONS
N66-16955

INFORMATION PROCESSING
TEMPORAL FACTORS IN PATTERN VISION
A66-80551

IRRELEVANT INFORMATION EFFECTS ON SHORT-TERM RETENTION OF RELEVANT INFORMATION
A66-80583

THEORY OF GROUP DECISION BEHAVIOR TESTED ON DYADS
A66-80637

MEMORY SPAN WITH EFFICIENT CODING PROCEDURES IN HUMANS
A66-80665

UNCERTAINTY, IMPORTANCE, AND AROUSAL AS DETERMINANTS OF PRE-DECISIONAL INFORMATION SEARCH
A66-80747

HISTORICAL BACKGROUND AND APPLICATIONS OF CYBERNETICS WHICH PERMITS THEORY RELATING INFORMATION PROCESSING TO LEARNING, THINKING, AND UNDERSTANDING
P-3144
N66-16946

INFORMATION TRANSFER
EFFECTS OF CONSPICUITY CODING ON TIME REQUIRED AND ERRORS MADE IN LOCATING UPDATED INFORMATION ON INDIVIDUAL AND GROUP COMMAND SYSTEM DISPLAYS
N66-16527

INFRASONIC FREQUENCY
L F AND INFRASONIC NOISE EFFECTS ON MANS CARDIAC RHYTHM, HEARING, VISION, MOTOR CONTROL, SPATIAL ORIENTATION, SPEECH AND SUBJECTIVE TOLERANCE
A66-17656

INHALATION
PERMISSIBLE SUPERSATURATION VALUE AFTER INHALATION OF AIR-HELIUM-OXYGEN MIXTURES AND DECOMPRESSION SICKNESS SYMPTOMS
N66-17130

BIOLOGICAL RADIATION EXPOSURE STUDIES - LARGE PARTICLE INHALATION IN DOGS, INTRAGASTRIC AND SKIN EXPOSURE IN PIGS, INGESTED PARTICLES IN RATS, AND PLUTONIUM 28 INGESTION RATS
NASA-CR-70520
N66-18157

INHIBITION
HYPOTHESIS TO EXPLAIN INHIBITING EFFECT OF MAGNETIC FIELDS ON CELL GROWTH RATE
A66-80647

SOMATIC AFFERENT VOLLEYS AND INHIBITORY CONTROL OF SPINAL REFLEXES DURING SLEEP IN CATS
A66-80702

INJECTION
PHYSIOLOGICAL RESPONSES IN RABBITS TO ARTIFICIAL EMBOLISM DUE TO INJECTIONS OF CARBON DIOXIDE, OXYGEN, AIR, AND HELIUM-OXYGEN MIXTURE
N66-17134

INCREASED TOLERANCE TO AIR EMBOLISM IN ANIMALS BY REPEATED INJECTIONS
N66-17135

INJURY
SEAT BELT INJURIES IN AIRCRAFT ACCIDENTS - CASE HISTORIES FOR EVIDENCE OF SYNDROME
A66-80633

HIGH FREE-FALL INJURIES - ANALYSIS OF FIFTY-THREE CASES
A66-80634

VERTEBRAL COLUMN INJURY DURING AIRCRAFT ACCIDENTS - CASE HISTORY
A66-80722

INSECT
PHYSIOLOGICAL RESPONSE OF GERM CELLS IN FLOWER BEETLES, TRIBOLIUM CASTANEUM, TO X-RAY IRRADIATION
HW-SA-3747
N66-17833

INSTRUCTION
PROGRAMMED INSTRUCTION TO LEARN BASIC OBSERVER SKILLS OF VISUAL SEARCH, TARGET RECOGNITION, GEOGRAPHIC ORIENTATION, AND TARGET LOCATION
N66-16545

INSTRUMENTATION
AIRCRAFT ACCIDENTS AND DISORIENTATION EXPERIENCES OF ARMY HELICOPTER PILOTS AS RELATED TO TRAINING AND INSTRUMENT DESIGN
A66-80563

INTELLIGENCE
AGING EFFECT ON INTELLIGENCE TEST SCORES
A66-80584

INTERNATIONAL LAW
MEDICAL USE OF HELICOPTERS AND GENEVA CONVENTION
A66-80725

INTERPLANETARY SPACE
DEFINITIONS OF LIFE ON EARTH, AND HABITABILITY OF OTHER PLANETS IN UNIVERSE
JPRS-34259
N66-18064

INTESTINE
REGIONAL BLOOD FLOW TO BRAIN, INTESTINE, AND HIND LIMB AND TOTAL BLOOD FLOW OF DOG BREATHING PURE OXYGEN
A66-80605

EFFECT OF HIGH-FREQUENCY VIBRATIONS ON ABSORPTION OF RADIOACTIVE PHOSPHORUS IN INTESTINE, IN DOGS
A66-80744

IODINE 125
IODINE 125 FOR USE IN BONE DENSITOMETRY
N66-17677

IODINE 131
EFFECT OF COMBINED ACTION OF RADIOIODINE-131 AND NOISE ON CARDIAC ACTIVITY IN DOGS
A66-80654

ION EXCHANGE
THERMODYNAMIC PRINCIPLES OF ION TRANSFER ACROSS MEMBRANES FOR NUTRIENT AND EXCREMENT FLOW IN BIOLOGICAL SYSTEM - ELECTROPHYSIOLOGY
BNL-9338
N66-17176

IONIZING RADIATION
IONIZING RADIATION EFFECTS IN MICE PROTECTED WITH HYPOXIA OR WITH CHEMICALS
A66-19086

ROLE OF MITOCHONDRIA OF LYMPHOCYTES IN RESPONSE TO IONIZING RADIATION IN WHITE RATS
A66-80523

PROTECTION FROM IONIZING RADIATION UNDER HYPOXIC CONDITIONS IN PLANTS AND ANIMALS
A66-80682

IONIZING RADIATION EFFECT ON SUBMICROSCOPIC STRUCTURES OF IRRADIATED FROGS AND RESULTING ALTERATIONS IN METABOLIC FUNCTIONS
COO-1080-1 N66-17943

PRODUCTION OF TOBACCO PLANT MUTANTS RESISTANT TO BLUE MOLD DISEASE BY SEED TREATMENT WITH IONIZING RADIATION - LITERATURE SURVEY
CNAEM-18 N66-18147

IRON
SERUM IRON IN ATHLETES AND UNTRAINED SUBJECTS AFTER PHYSICAL EXERCISE A66-80660

IRON COMPOUND
MOSSBAUER EFFECT IN FE57 STUDYING HEMOGLOBIN, OXYHEMOGLOBIN, CARBOHEMOGLOBIN, CARBOXYHEMOGLOBIN, HEMIN, AND HEME OF HUMAN AND RAT BLOOD A66-80646

IRRADIATION
RELATIONS BETWEEN LACTATE PRODUCTION, RESPIRATION, AND NUCLEAR DAMAGE IN IRRADIATED RAT THYMOCYTES
EUR-2623.E N66-18146

ISCHEMIA
ELECTROMETRIC SURFACE PH OF ISCHEMIC KIDNEY AND EFFECT OF HYPOTHERMIA IN DOGS AND RABBITS A66-80629

ISOTOPE
EFFECT OF HIGH-FREQUENCY VIBRATIONS ON ABSORPTION OF RADIOACTIVE PHOSPHORUS IN INTESTINE, IN DOGS A66-80744

J

JET AIRCRAFT
OXYGEN SYSTEM FOR CREW OF EXECUTIVE JET AIRCRAFT, USING CONTINUOUS FLOW OF OXYGEN, FIXED CAPACITY RESERVIOR, AND PROVIDING SAFETY PRESSURE
FPRC/MEMO-207 N66-18054

JET FLIGHT
PHASE SHIFTING OF HUMAN CIRCADIAN SYSTEM DURING TRANSCONTINENTAL JET FLIGHTS A66-80547

K

KIDNEY
ELECTROMETRIC SURFACE PH OF ISCHEMIC KIDNEY AND EFFECT OF HYPOTHERMIA IN DOGS AND RABBITS A66-80629

L

LACTATE
DIURNAL VARIATION IN COLLAGEN RIBONUCLEIC ACID, DEOXYRIBONUCLEIC ACID, LACTATE, AND CALCIUM METABOLIC ACTIVITY OF RAT BONE TISSUE A66-80574

PHYSICAL AND CHEMICAL PROPERTIES OF ALPHA-LACTALBUMIN CRYSTALS PREPARED FROM GOAT MILK N66-16363

RELATIONS BETWEEN LACTATE PRODUCTION, RESPIRATION, AND NUCLEAR DAMAGE IN IRRADIATED RAT THYMOCYTES
EUR-2623.E N66-18146

LATERALITY
INDIVIDUAL VARIATIONS IN POSTOCULAR LINES OF REGARD A66-80666

LEARNING
PERSEVERATION LEARNING SET FORMATION TO NON-REWARDED CUES BY NORMAL AND PREVIOUSLY IRRADIATED MONKEYS A66-80585

AVOIDANCE LEARNING, BLOOD GLUCOSE LEVEL, BODY WEIGHT, AND PROTEIN BOUND IODINE OF RAT EXPOSED TO COLD STRESS AND HABENULAR LESION A66-80614

GALVANIC SKIN RESPONSE, HEART RATE, AND MUSCLE ACTION BIOELECTRIC POTENTIAL SIGNALS AS PSYCHOPHYSIOLOGICAL RESPONSE TO LEARNING TASK DIFFICULTY
NAVTRADEVCEN-IH-34 N66-16639

LEARNING SYSTEM
PROGRAMMED INSTRUCTION TO LEARN BASIC OBSERVER SKILLS OF VISUAL SEARCH, TARGET RECOGNITION, GEOGRAPHIC ORIENTATION, AND TARGET LOCATION N66-16545

STOCHASTIC AUTOMATIC MODELS FOR SYNTHESIS OF LEARNING SYSTEMS
TR-EE65-17 N66-17615

LEUKOCYTE
ROLE OF MITOCHONDRIA OF LYMPHOCYTES IN RESPONSE TO IONIZING RADIATION IN WHITE RATS A66-80523

HEMATOPOIETIC CHANGES IN DIFFERENT ANIMALS AFTER X-IRRADIATION AS COMPARED WITH ANALOGOUS CHANGES IN MAN A66-80724

LIFE DETECTOR
EXTRATERRESTRIAL LIFE DETECTION AND LIFE SUPPORT SYSTEMS IN MANNED SPACE TRAVEL, NOTING ELECTRONIC EQUIPMENT NECESSARY FOR IT A66-18727

LIFE SUPPORT SYSTEM
LIFE SUPPORT CLOSED CYCLES FOR MISSIONS TO OUTER SPACE LASTING 12 MONTHS OR LONGER, CONSIDERING RECOVERY AND REPLENISHING OF WATER, FOOD AND OXYGEN FROM WASTES A66-17229

ZERO-GRAVITY EFFECT ON OPOSSUM FETUS OBSERVED BY TV SYSTEM IN PROPOSED SATELLITE A66-18726

EXTRATERRESTRIAL LIFE DETECTION AND LIFE SUPPORT SYSTEMS IN MANNED SPACE TRAVEL, NOTING ELECTRONIC EQUIPMENT NECESSARY FOR IT A66-18727

DRINKING WATER RECLAMATION FROM URINE BY THERMOELECTRICS, INCLUDING OPERATIONAL THEORY AND DATA FOR WORKING MODELS A66-18730

OXYGEN RECOVERY FROM METABOLIC CARBON DIOXIDE FOR SPACECRAFT ENVIRONMENT A66-18821

SOLID ELECTROLYTE CARBON DIOXIDE REDUCTION SYSTEM FOR SUBORBITAL FLIGHT
AMRL-TR-65-153 N66-16643

PORTABLE LIFE SUPPORT SYSTEM AND PRESSURIZED SUIT FOR EXTRAVEHICULAR MOBILITY UNIT TO PROTECT MAN AGAINST LUNAR SURFACE AND FREE SPACE HAZARDS N66-17387

OUTPUT CHARACTERISTICS, PERFORMANCE DECREMENT FROM WEARING PRESSURIZED SUITS, AND LIFE SUPPORT REQUIREMENTS IN SPACE ENVIRONMENT N66-17393

LIGHT INTENSITY
EFFECTS OF LIGHT INTENSITY AND CULTURE DENSITY ON ALGAL OXYGEN PRODUCTION
NRL-6331 N66-16214

LIMB
SYNCOPE INDUCED BY APPLICATION OF NEGATIVE PRESSURE TO LOWER BODY AND EFFECT ON LUNG CARBON MONOXIDE DIFFUSING CAPACITY A66-80565

REGIONAL BLOOD FLOW TO BRAIN, INTESTINE, AND HIND LIMB AND TOTAL BLOOD FLOW OF DOG BREATHING PURE OXYGEN A66-80605

LIPID METABOLISM
CYTOPLASMIC ALTERATIONS AND FAT VACUOLE FORMATION IN PNEUMOCYTES OF GUINEA PIGS EXPOSED TO SEVERE HYPOXIA IN LOW PRESSURE CHAMBER A66-18769

EFFECT OF PROLONGED COLD AND STARVATION, AND SUBSEQUENT REFEEDING ON PLASMA LIPIDS AND GLUCOSE IN NORMAL MAN A66-80630

OXYGEN CONSUMPTION AND SERUM LIPID LEVELS OF BABOON, PAPIO URSINUS, GIVEN SATURATED AND POLYUNSATURATED FAT DIETS A66-80710

LIVER
PHOSPHORYLATION OF FRUCTOSE IN RAT SKELETAL MUSCLES AND LIVER TISSUES DURING HYPOXIA AT SIMULATED ALTITUDE A66-80656

LOCOMOTION
RESPIRATORY ASPECTS OF WALKING UNDER SUBGRAVITY CONDITIONS WITH VARIOUS GROUND FRICTION A66-80726

LOGIC
LOGIC DIAGRAMS OF PILOT ACTION IN EMERGENCY SITUATION
JPRS-34200 N66-17638

LOW ALTITUDE
TASK LOADING EFFECTS ON PILOT PERFORMANCE DURING SIMULATED LOW ALTITUDE, HIGH SPEED, TERRAIN FOLLOWING MISSIONS N66-16540

MISSION, PERSONNEL, AND HARDWARE DEMANDS OF LOW ALTITUDE NAVIGATION N66-16541

LOW TEMPERATURE ENVIRONMENT
EFFECTS OF ADAPTATION OF MICE TO COLD ON REPRODUCTION AND GROWTH A66-80521

EFFECT OF PROLONGED COLD AND STARVATION, AND SUBSEQUENT REFEEDING ON PLASMA LIPIDS AND GLUCOSE IN NORMAL MAN A66-80630

EFFECT OF LOW ENVIRONMENTAL TEMPERATURE ON CELLULAR BLOOD ELEMENTS AND WEIGHT GAIN IN RABBITS A66-80639

LUMINOSITY
EFFECT OF WAVELENGTH AND BANDWIDTH OF RED LIGHT ON RECOVERY OF DARK ADAPTATION A66-80678

LUMINOUS INTENSITY
EFFECTS OF HIGH LUMINANCE SOURCES UPON VISIBILITY OF POINT SOURCES
NASA-TM-X-56561 N66-18332

LUNAR EXPLORATION
EXTRAVEHICULAR MOBILITY UNIT / EMU/ TO BE WORN BY ASTRONAUTS ON APOLLO LUNAR LANDING MISSION A66-18584

LUNAR FLIGHT
RADIATION EXPOSURE OF ASTRONAUTS DURING LUNAR MISSIONS A66-80683

LUNAR LANDING
EXTRAVEHICULAR MOBILITY UNIT / EMU/ TO BE WORN BY ASTRONAUTS ON APOLLO LUNAR LANDING MISSION A66-18584

LUNAR SURFACE
PORTABLE LIFE SUPPORT SYSTEM AND PRESSURIZED SUIT FOR EXTRAVEHICULAR MOBILITY UNIT TO PROTECT MAN AGAINST LUNAR SURFACE AND FREE SPACE HAZARDS N66-17387

LUNG
EFFECT OF BLOOD HYDROGEN ION CONCENTRATION ON HYPOXIC PULMONARY VASOCONSTRICTION IN DOGS A66-80586

LYMPH
RADIATION CHIMERA MORTALITY RATE IN RELATION TO NUMBER OF TRANSPLANTED BONE MARROW AND LYMPH NODE CELLS
MBL/1965/23 N66-17484

M

MACROMOLECULE
PREPARATION, PROPERTIES, AND STORAGE STABILITY OF MACROMOLECULES LABELLED BY TRITIUM AND BY BIOLOGICAL SYNTHESIS - NUCLEIC ACIDS, LYSOZYME, AND RIBONUCLEASE
EUR-2419.F N66-16439

MAGNETIC EFFECT
EFFECT OF EXTREMES IN MAGNETIC ENVIRONMENT ON PHYSIOLOGICAL BEHAVIOR A66-18585

DELAYED SEA URCHIN EGG MITOSIS BY HIGH MAGNETIC FIELD - TESTING METHODS FOR MAGNETIC FIELD-FREE ENVIRONMENT
NASA-CR-70632 N66-18318

MAGNETIC FIELD
ENZYME SUBSTRATE - RNA-RIBONUCLEASE AND SUCCINATE-CYTOCHROME C REDUCTASE - REACTIONS IN HIGH MAGNETIC FIELDS A66-80645

HYPOTHESIS TO EXPLAIN INHIBITING EFFECT OF MAGNETIC FIELDS ON CELL GROWTH RATE A66-80647

DELAYED SEA URCHIN EGG MITOSIS BY HIGH MAGNETIC FIELD - TESTING METHODS FOR MAGNETIC FIELD-FREE ENVIRONMENT
NASA-CR-70632 N66-18318

MAGNETISM
EFFECT OF EXTREMES IN MAGNETIC ENVIRONMENT ON PHYSIOLOGICAL BEHAVIOR A66-18585

MAMMAL
CELL AND SOLUTION VELOCITY CONSTANTS FOR REACTION TO FORM CARBOXYHEMOGLOBIN AT DIFFERENT TEMPERATURES RED BLOOD CELL SIZE A66-80557

MOSSBAUER EFFECT IN FE57 STUDYING HEMOGLOBIN, OXYHEMOGLOBIN, CARBOHEMOGLOBIN, CARBOXYHEMOGLOBIN, HEMIN, AND HEME OF HUMAN AND RAT BLOOD A66-80646

NEURONAL ACTIVITY IN VISUAL AND MOTOR CORTEX DURING SLEEP AND WAKING IN MAMMALS A66-80697

MAN-MACHINE SYSTEM
MAN-MACHINE CONFLICT IN HIGH PERFORMANCE TACTICAL FIGHTER A66-17282

FUNCTIONAL EXTENSION OF HUMAN HANDS THROUGH REMOTE CONTROL MACHINE
NASA-CR-69856 N66-16394

MANNED ORBITAL RESEARCH LABORATORY /MORL/
SYNTHESIS FRAMEWORK OF EXPERIMENT PROGRAM FOR ORBITING RESEARCH LABORATORIES APPLIED TO BIOMEDICINE/BEHAVIOR TO ASSURE PHYSIOLOGICAL SAFETY ON ADVANCED SPACE MISSIONS
NASA-CR-70356 N66-17053

SYNTHESIS FRAMEWORK OF EXPERIMENT PROGRAM FOR ORBITING RESEARCH LABORATORIES APPLIED TO BIOSCIENCE FOR DETERMINATION OF ORIGIN, NATURE, AND EVOLUTION OF LIFE
NASA-CR-70342, VOL. B, PT. XII N66-17058

MANNED SPACE FLIGHT
EXTRATERRESTRIAL LIFE DETECTION AND LIFE SUPPORT SYSTEMS IN MANNED SPACE TRAVEL, NOTING ELECTRONIC EQUIPMENT NECESSARY FOR IT A66-18727

NEUROPHYSIOLOGICAL ASPECTS OF MANNED SPACE FLIGHT IN RELATION TO BEHAVIOR AND ILLUSIONS A66-80518

COSMIC RADIATION HAZARDS AND EFFECT ON MAN AND ANIMALS IN RELATION TO SOLAR ACTIVITY AND FLIGHT DURATION A66-80519

SPACE FLIGHT HAZARDS - SURVEY OF PRESENT PROBLEMS IN MANNED SPACE FLIGHT A66-80628

CHANGES IN WORKING CAPACITY OF MUSCLE AFTER EXPOSURE OF MAN TO HYPOKINETIC CONDITIONS AND IMPORTANCE TO MANNED SPACE FLIGHT A66-80737

DEHYDRATION AND WEIGHTLESSNESS IN MANNED SPACE FLIGHT N66-16428

HUMAN ENGINEERING AND PERFORMANCE CONSIDERATIONS IN SPACECRAFT DESIGN AND SPACE FLIGHT MISSIONS N66-16429

REGENERATIVE WASTE DISPOSAL SYSTEM SUPPLYING PHYSIOLOGICAL REQUIREMENTS FOR HUMANS IN SPACE CRAFT

PB-168787 N66-17429

SIMULATED MANNED FLIGHT IN SPACE TRAINING CAPSULE
JPRS-33934 N66-17620

MANUAL CONTROL
COMPUTER PROGRAM TO SIMULATE SECOND ORDER SERVO SYSTEM DYNAMICS UNDER AUTOMATIC AND MANUAL CONTROL
NASA-CR-70340 N66-17082

MARS /PLANET/
LIFE ON MARS - CONDITIONS, POSSIBLE TYPES OF ORGANISMS AND THEORIES OF ADVANCED FORMS OF LIFE
A66-80582

MARS ENVIRONMENT
BACILLUS SPORE GERMINATION IN SIMULATED MARTIAN ENVIRONMENT
NASA-CR-70524 N66-18088

MARS PROBE
QUALITATIVE AND QUANTITATIVE TEST FOR ENZYME ACTIVITIES IN TERRESTRIAL SOIL ADAPTED TO MARS PROBE TELEMETRY PROCEDURES
NASA-CR-70058 N66-18163

MASS SPECTROMETRY
OPTICAL PROPERTIES OF AMINO ACIDS USING MASS SPECTROMETRY AND GAS CHROMATOGRAPHY
AFOSR-65-1632 N66-16516

MATHEMATICAL MODEL
MATHEMATICAL MODEL FOR CIRCADIAN RHYTHMS
A66-80517

BIOLOGICAL RHYTHM, ENVIRONMENTAL PERIODICITIES, AND MATHEMATICAL MODELS A66-80550

MATHEMATICAL DESCRIPTION OF CONTINUOUS CULTURING OF MICROALGAE
JPRS-33831 N66-16315

PROPOSED CEREBRAL CORTEX DUPLICATION OF FOURIER OPTICAL TRANSFORM PROCESS AND SPACIAL FILTERING - MATHEMATICAL MODEL
GE/EE/65-18 N66-16986

STOCHASTIC AUTOMATIC MODELS FOR SYNTHESIS OF LEARNING SYSTEMS
TR-EE65-17 N66-17615

MEASURING APPARATUS
POLAROGRAPHIC MEASUREMENT OF BLOOD OXYGEN TENSION AS AFFECTED BY PH, HEPARIN, HEMATOCRIT AND ENVIRONMENTAL TEMPERATURE A66-80623

TRANSDUCER FOR RECORDING INSTANTANEOUS RESPIRATORY WAVEFORMS IN ANIMALS AND MAN A66-80624

MEDICAL PERSONNEL
TWO YEARS OPERATIONAL EXPERIENCE OF TITAN II ICBM MEDICAL SUPPORT PERSONNEL IN PREVENTING ACCIDENTS FROM OPERATIONAL HAZARDS A66-80567

MEDICINE /GEN/
REPORTS FROM U.S.S.R. ACADEMY OF MEDICAL SCIENCES ON CORTICOSTEROIDS, STEROID HORMONES, DIABETES, THYROID GLAND AND PANCREAS DISEASES, AUTORADIOGRAPHY, AND ELECTROCARDIOGRAPHY
JPRS-33643 N66-16244

SYNTHESIS FRAMEWORK OF EXPERIMENT PROGRAM FOR ORBITING RESEARCH LABORATORIES APPLIED TO BIOMEDICINE/BEHAVIOR TO ASSURE PHYSIOLOGICAL SAFETY ON ADVANCED SPACE MISSIONS
NASA-CR-70356 N66-17053

MELTING POINT
ONE-DIMENSIONAL ISING MODEL TO EXPLAIN MELTING TEMPERATURE LINEAR DEPENDENCE OF COPOLYMERIC D NA
BN-425 N66-17005

MEMBRANE
THERMODYNAMIC PRINCIPLES OF ION TRANSFER ACROSS MEMBRANES FOR NUTRIENT AND EXCREMENT FLOW IN BIOLOGICAL SYSTEM - ELECTROPHYSIOLOGY
BNL-9338 N66-17176

MEMBRANE FORCE
BIOELECTRICITY HISTORICAL REVIEW AND PRINCIPLES OF MEMBRANE POTENTIAL - ELECTROPHYSIOLOGY
BNL-9337 N66-17175

MEMBRANE STRUCTURE
ARCHITECTURE AND STRUCTURE OF OTOLITH END ORGAN
NASA-CR-70393 N66-17272

MEMORY
IRRELEVANT INFORMATION EFFECTS ON SHORT-TERM RETENTION OF RELEVANT INFORMATION
A66-80583

MEMORY SPAN WITH EFFICIENT CODING PROCEDURES IN HUMANS A66-80665

SELF REGULATION AND MEMORY LOCATION IN HUMAN BRAIN
JPRS-33898 N66-16258

METABOLIC WASTE
OXYGEN RECOVERY FROM METABOLIC CARBON DIOXIDE FOR SPACECRAFT ENVIRONMENT A66-18821

METABOLISM
METABOLIC RATES IN PRESSURIZED PRESSURE SUIT, AFFECTING HEAT BALANCE OF SUBJECTS METABOLIC HEAT WITH HEAT REMOVED BY ENVIRONMENTAL CONTROL
A66-17657

CONSIDERATION OF ERRORS IN STUDY OF CIRCADIAN RHYTHMS IN ENERGY METABOLISM A66-80515

ROLE OF ENDOCRINE AND CENTRAL NERVOUS SYSTEMS IN VARIOUS BIOLOGICAL RHYTHMS IN INSECTS, CRUSTACEANS AND VERTEBRATES CONCERNING METABOLISM
A66-80534

DEVIATIONS FROM HUMAN RHYTHMIC METABOLIC FUNCTIONS
A66-80536

CIRCADIAN SYSTEMS OF METABOLISM AND TESTICULAR RESPONSE IN PHOTOPERIODIC RESPONSES IN VERTEBRATES A66-80542

AVOIDANCE LEARNING, BLOOD GLUCOSE LEVEL, BODY WEIGHT, AND PROTEIN BOUND IODINE OF RAT EXPOSED TO COLD STRESS AND HABENULAR LESION
A66-80614

HEAT, FOOD INTAKE, AND AGING EFFECTS ON THYROID FUNCTION OF MALE RATS A66-80619

SERUM IRON IN ATHLETES AND UNTRAINED SUBJECTS AFTER PHYSICAL EXERCISE A66-80660

MORPHOLOGY AND FUNCTION OF SLEEP PHYSIOLOGY
A66-80688

BIOCHEMISTRY DURING SLEEP AND WAKEFULNESS - REVIEW OF EXPERIMENTS IN BRAIN METABOLISM
A66-80689

RELATION OF ELECTROENCEPHALOGRAM TO BRAIN CORTEX METABOLISM IN MAMMALS A66-80691

HYPOXEMIA EFFECT ON CORONARY CIRCULATION AND HEART MUSCLE METABOLISM A66-80729

IONIZING RADIATION EFFECT ON SUBMICROSCOPIC STRUCTURES OF IRRADIATED FROGS AND RESULTING ALTERATIONS IN METABOLIC FUNCTIONS
COO-1080-1 N66-17943

MICROBIOLOGY
TEXT ON PREVENTION OF CONTAMINATION OF OTHER CELESTIAL BODIES BY TERRESTRIAL ORGANISMS VIA SPACE VEHICLES A66-19238

RESISTANCE EVALUATION OF NATURAL SOURCE SPORE ISOLATES TO INACTIVATION BY THERMAL SHOCK
NASA-CR-70029 N66-16712

MICRODENSITOMETER
COMPARISON OF CORTICAL THICKNESS AND RADIOGRAPHIC MICRODENSITOMETER MEASUREMENTS IN DETERMINING BONE LOSS N66-17672

MICROORGANISM
MATHEMATICAL DESCRIPTION OF CONTINUOUS CULTURING OF MICROALGAE
JPRS-33831 N66-16315

DRY HEAT EFFECTIVENESS IN MICROORGANISM STERILIZATION AT 105 DEG C FOR SPACE PROBE APPLICATIONS
NASA-CR-70321 N66-17088

MICROORGANIC CONTAMINATION OF STAINLESS STEEL DUE TO HANDLING BY PERSONNEL
NASA-TM-X-55408 N66-17240

MICROSCOPY
VIBRATING MIRROR FLYING SPOT ULTRAVIOLET MICROSCOPE WITH INCORPORATED TELEVISION SYSTEM - ULTRAVIOLET RADIATION EFFECTS ON CELL STRUCTURE AND BEHAVIOR
TID-21611 N66-17985

MIDDLE EAR PRESSURE
ALTERNOBARIC VERTIGO AMONG SWEDISH PILOTS AS RELATED TO COLDS AND ABILITY TO EQUALIZE MIDDLE EAR PRESSURE A66-80569

MILITARY AVIATION
HUMAN PERFORMANCE AND BEHAVIOR ASSESSMENT IN AIR FORCE SYSTEMS AND SUBSYSTEMS
SSD-65-172/514/R N66-16664

MILITARY HELICOPTER
DAY-TO-DAY OPERATIONAL QUALITY CONTROL PROGRAM USED IN THE TRAINING OF ARMY HELICOPTER PILOTS N66-16544

MISSION ANALYSIS
MISSION, PERSONNEL, AND HARDWARE DEMANDS OF LOW ALTITUDE NAVIGATION N66-16541

MITOCHONDRIA
ROLE OF MITOCHONDRIA OF LYMPHOCYTES IN RESPONSE TO IONIZING RADIATION IN WHITE RATS A66-80523

MITOSIS
CELL DIVISION RHYTHM AND CIRCADIAN CLOCK IN PLANTS AND ANIMALS A66-80529

MOLECULAR ASPECTS OF CIRCADIAN SYSTEMS IN MITOSIS AND PHOTOSYNTHESIS IN MICROORGANISMS A66-80531

DELAYED SEA URCHIN EGG MITOSIS BY HIGH MAGNETIC FIELD - TESTING METHODS FOR MAGNETIC FIELD-FREE ENVIRONMENT
NASA-CR-70632 N66-18318

MODE OF VIBRATION
WHOLE-BODY HUMAN RESPONSE TO RANDOM AND SINUSOIDAL VIBRATION AT VARIOUS MODES N66-16535

MOLECULAR PHYSICS
PHYSICAL PARAMETERS OF BIOLOGICAL LIVING SYSTEMS AND THEIR OPERATIONAL RELATIONSHIPS
JPRS-33830 N66-16397

MONKEY
PERSEVERATION LEARNING SET FORMATION TO NON-REWARDED CUES BY NORMAL AND PREVIOUSLY IRRADIATED MONKEYS A66-80585

PERFORMANCE OF IMPLANTED ELECTRODE FOR ELECTRO-NYSTAGMOGRAPHY IN SQUIRREL MONKEY A66-80621

MONOCHROMATIC RADIATION
MONOCHROMATIC RED, WHITE, GREEN, AND BLUE SOLAR LIGHT RADIATION EFFECT ON PLANT GROWTH, DEVELOPMENT, AND YIELD N66-16275

MONOCULAR VISION
ROLE OF KNOWLEDGE IN DISTANCE PERCEPTION ON BINOCULAR OR MONOCULAR BASIS A66-80664

MORPHOLOGY
MORPHOLOGICAL CHARACTERISTICS AND FUNCTIONAL DATA IN PILOT TRAINEES, NOTING ANTHROPOMETRIC DATA AND VITAL CAPACITY, OXYGEN INTAKE, HEART RATE, ETC A66-19084

MORPHOLOGY AND FUNCTION OF SLEEP PHYSIOLOGY A66-80688

MOSSBAUER EFFECT
MOSSBAUER EFFECT IN FE57 STUDYING HEMOGLOBIN, OXYHEMOGLOBIN, CARBOHEMOGLOBIN, CARBOXYHEMOGLOBIN, HEMIN, AND HEME OF HUMAN AND RAT BLOOD A66-80646

MOTION SICKNESS
SUPPRESSION OF MOTION SICKNESS BY THIETHYLPERAZINE A66-80570

NEW THERAPY OF MOTION SICKNESS DECREASING GASTROINTESTINAL MOTILITY USING BETHANECHOL CHLORIDE A66-80572

VALIDITY OF BRIEF VESTIBULAR DISORIENTATION TEST IN SCREENING PILOT TRAINEES
NASA-CR-70146 N66-16603

MOTION SICKNESS DRUG
NEW THERAPY OF MOTION SICKNESS DECREASING GASTROINTESTINAL MOTILITY USING BETHANECHOL CHLORIDE A66-80572

HUMAN CENTRIFUGE STUDIES OF RELATIVE EFFECTIVENESS OF ANTIMOTION SICKNESS DRUGS, INCLUDING HYOSCINE D-AMPHETAMINE, MECLIZINE, CHLORPROMAZINE, THIETHYLPERAZINE, PROCHLORPERAZINE, AND TRIMETHOBENZAMIDE A66-80573

PHYSIOLOGICAL RESPONSES TO ANTIMOTION SICKNESS DRUGS - ANTIHISTAMINES, BELLADONNAS, AND PHENOTHIAZINES
NASA-CR-70175 N66-16971

MOTOR SYSTEM /BIOL/
PRESSURE CHAMBER EXPERIMENTS FOR STUDYING CHANGES IN MOTOR, CADIOVASCULAR, RESPIRATORY, AND CENTRAL NERVOUS SYSTEMS DURING OXYGEN TOXICITY N66-17145

MOUSE
EFFECTS OF ADAPTATION OF MICE TO COLD ON REPRODUCTION AND GROWTH A66-80521

THERMOREGULATION IN MICE AND HELIUM-OXYGEN ATMOSPHERE CONDUCTIVITY A66-80681

MAXIMAL RESISTANCE DURING ALTITUDE SIMULATION TO ACUTE HYPOXIA IN MICE TREATED WITH CORTISONE, TESTOSTERONE, AND SOMATOTROPIC HORMONE A66-80723

LIFE SHORTENING IN MICE EXPOSED TO X-RAY IRRADIATION IN RELATION TO AGE AND HYPOXIA A66-80731

COMBINED EFFECT OF ACCELERATION AND RADIATION ON PHYSIOLOGICAL FUNCTION IN MICE A66-80740

EFFECTS OF VIBRATION, ACCELERATION AND IRRADIATION ON CHROMOSOMES IN MICE A66-80741

HYPERBARIC OXYGEN EFFECT ON MICRORGANISMS IN VITRO AND IN LIVE MICE GIVEN INFECTIOUS INJECTIONS N66-16955

HOMOGRAFT RESPONSE AND HEMAGGLUTININ PRODUCTION BY SENSITIZED THYMECTOMIZED IRRADIATED ADULT MICE
USNRDL-TR-920 N66-17065

MUSCLE
PHOSPHORYLATION OF FRUCTOSE IN RAT SKELETAL MUSCLES AND LIVER TISSUES DURING HYPOXIA AT SIMULATED ALTITUDE A66-80656

MYOELECTRIC POTENTIAL RESPONSE AND FORCE OF MUSCLE CONTRACTION
REPT.-2386 N66-16308

MUSCLE RELAXANT
EFFECT OF DECAMETHONIUM ON HEAD LIFT, HAND GRIP, AND RESPIRATORY MUSCLE POWER IN MAN A66-80598

MUSCULAR FATIGUE
WEIGHTLESSNESS EFFECTS ON CIRCULATORY SYSTEM AND MUSCULAR ACTIVITY OF ANIMALS AND HUMANS DURING SPACE FLIGHTS
JPRS-34064 N66-18028

MUSCULAR FUNCTION
MEASUREMENT OF MUSCLE TREMOR FREQUENCY DISTRIBUTION ASSOCIATED WITH HAND-HELD FIELD GLASSES AND RESOLUTION EFFECTS A66-80576

SCALENE AND STERNOMASTOID MUSCLE FUNCTION AND RESPIRATION IN HUMANS A66-80597

EFFECT OF DECAMETHONIUM ON HEAD LIFT, HAND GRIP, AND RESPIRATORY MUSCLE POWER IN MAN A66-80598

CHANGES IN WORKING CAPACITY OF MUSCLE AFTER EXPOSURE OF MAN TO HYPOKINETIC CONDITIONS AND IMPORTANCE TO MANNED SPACE FLIGHT A66-80737

MUSCULAR SYSTEM
MUSCULAR ORIGIN OF ELEVATED PLASMA POTASSIUM DURING PHYSICAL EXERCISE IN MAN A66-80618

MUSCULAR TONUS
ROLE OF PROPRIOCEPTIVE IMPULSES DURING RESPIRATION WITH INCREASED INTRAPULMONARY PRESSURE IN REGULATING RESPIRATION AND CIRCULATION N66-17156

MUTATION
PRODUCTION OF TOBACCO PLANT MUTANTS RESISTANT TO BLUE MOLD DISEASE BY SEED TREATMENT WITH IONIZING RADIATION - LITERATURE SURVEY
CNAEM-18 N66-18147

MYOELECTRIC POTENTIAL
MYOELECTRIC POTENTIAL RESPONSE AND FORCE OF MUSCLE CONTRACTION
REPT.-2386 N66-16308

N

NAVIGATION SYSTEM
CLOCK MECHANISMS IN CELESTIAL ORIENTATION OF ANIMALS A66-80549

NERVOUS SYSTEM
ELECTRICAL ACTIVITY OF PHRENIC NERVE FROM RESPIRATORY CENTER OF DOG DURING OBSTRUCTED BREATHING A66-80601

BEHAVIOR REFLEX REGULATION OF DECORTICATE CAT, NEURAL MECHANISMS RESPONSIBLE FOR DEEP SLEEP, AND REFLEXES IN CIRCULATION REGULATION DURING SLEEP
AFOSR-65-1579 N66-16469

ADSORPTION CHANGES IN NERVOUS SYSTEM AND INTERNAL ORGANS OF MICE DURING OXYGEN-INDUCED CONVULSIONS N66-17144

PRESSURE CHAMBER EXPERIMENTS FOR STUDYING CHANGES IN MOTOR, CADIOVASCULAR, RESPIRATORY, AND CENTRAL NERVOUS SYSTEMS DURING OXYGEN TOXICITY N66-17145

HIGHER NERVOUS ACTIVITY CHANGES IN STIMULUS RESPONSE FOR DOGS UNDER RAREFIED AIR AND ANOXIC CONDITIONS N66-17148

HUMAN BODY ADAPTIVE REACTION TO INCREASED AIR PRESSURE BASED ON HIGHER NERVOUS SYSTEM STUDY N66-17152

BIBLIOGRAPHY OF GLIA CELL STUDIES
NASA-CR-70631 N66-18316

NEUROLOGY
BEHAVIOR REFLEX REGULATION OF DECORTICATE CAT, NEURAL MECHANISMS RESPONSIBLE FOR DEEP SLEEP, AND REFLEXES IN CIRCULATION REGULATION DURING SLEEP
AFOSR-65-1579 N66-16469

BIBLIOGRAPHY OF GLIA CELL STUDIES
NASA-CR-70631 N66-18316

ANATOMY OF CENTRE MEDIAN NUCLEUS OF LUYS
NASA-TM-X-56159 N66-18369

NEURON
DEMONSTRATION AND VARIATION OF CIRCADIAN RHYTHM OF ACTIVITY IN SINGLE NEURON OF SEA HARE A66-80548

NEUROHUMORAL SLEEP TRANSMISSION IN RABBIT A66-80690

NEURONAL ACTIVITY IN VISUAL AND MOTOR CORTEX DURING SLEEP AND WAKING IN MAMMALS A66-80697

NEUROPHYSIOLOGY
NEUROLOGIC ADAPTATIONS AND AUDIOGENIC RESPONSES IN MICE EXPOSED TO CHRONIC 2 X GRAVITY FIELD, NOTING DEVELOPMENT OF MORE EFFICIENT CIRCULATORY SYSTEM, GROWTH PATTERN ALTERATIONS, ETC A66-17660

NEUROPHYSIOLOGICAL ASPECTS OF MANNED SPACE FLIGHT IN RELATION TO BEHAVIOR AND ILLUSIONS A66-80518

BRAIN STEM MECHANISMS ANTAGONISTIC TO RETICULAR ACTIVATING SYSTEM A66-80693

BULBAR CONTROL OF AROUSAL SYSTEM IN CATS A66-80695

NEUTRON ACTIVATION
NEUTRON ACTIVATION AND SCINTILLATION COUNTERS FOR DETECTION OF SODIUM AND POTASSIUM IN BIOLOGICAL MEDIA
CEA-R-2837 N66-17491

NITROGEN
ANIMAL STUDIES ON SUPERSATURATION WITH NITROGEN AND INCREASED BODY RESISTANCE TO DECOMPRESSION SICKNESS N66-17131

NITROGEN COMPOUND
COVERT PATHOGENESIS OF NITROGEN DIOXIDE INDUCED EMPHYSEMA IN RATS A66-80669

NOISE
EFFECT OF COMBINED ACTION OF RADIOIODINE-131 AND NOISE ON CARDIAC ACTIVITY IN DOGS A66-80654

NOISE HAZARD
L F AND INFRASONIC NOISE EFFECTS ON MANS CARDIAC RHYTHM, HEARING, VISION, MOTOR CONTROL, SPATIAL ORIENTATION, SPEECH AND SUBJECTIVE TOLERANCE A66-17656

NOMOGRAM
NOMOGRAM BY ASTRAND AND RYHMING AS PREDICTOR OF MAXIMUM OXYGEN INTAKE IN MAN DURING SUBMAXIMAL EXERCISE A66-80599

NOREPINEPHRINE
INCREASED SENSITIVITY OF COLD ADAPTED RAT TO NORADRENALINE AS RELATED TO RESERPINE A66-80615

NOREPINEPHRINE AND ANGIOTENSIN EFFECTS ON CORONARY FLOW AND MYOCARDIAL OXYGEN CONSUMPTION IN CAT A66-80635

NUCLEAR EFFECT
RELATIONS BETWEEN LACTATE PRODUCTION, RESPIRATION, AND NUCLEAR DAMAGE IN IRRADIATED RAT THYMOCYTES
EUR-2623.E N66-18146

NUCLEAR EXPLOSION
MILK RADIOACTIVITY DETERMINATION AFTER ATOMIC ATTACK BY GEIGER- MUELLER COUNTING TUBE
MBL/1965/22 N66-17483

NUCLEIC ACID
PREPARATION, PROPERTIES, AND STORAGE STABILITY OF MACROMOLECULES LABELLED BY TRITIUM AND BY BIOLOGICAL SYNTHESIS - NUCLEIC ACIDS, LYSOZYME, AND RIBONUCLEASE
EUR-2419.F N66-16439

NUCLEUS
ROLE OF NUCLEUS IN CYTOPLASMIC DIURNAL RHYTHM OF GREEN ALGAE OXYGEN PRODUCTION A66-80533

NUTRITION
VITAMIN CONTENT, NUTRITIONAL VALUE, AND AMINO ACID COMPOSITION OF EGG WHITE AFTER LONG TERM STORAGE AT ROOM TEMPERATURE
R-2089 N66-18072

NYSTAGMUS
INFRARED IMAGE-CONVERTER METHOD OF OBSERVING EYE MOTION IN FLASH BLINDNESS EXPERIMENTS. A66-80675

IMPORTANCE IN PILOT TRAINING AND EVALUATION OF INDUCED NYSTAGMUS IN SUBJECTS WITH SPONTANEOUS NYSTAGMUS - DIFFERENTIATION OF TYPES OF NYSTAGMUS WITH ELECTRONYSTAGMOGRAPHY A66-80716

VISUAL PERCEPTION DURING POST-ROTATORY NYSTAGMUS IN PILOTS A66-80718

O

OPERATIONAL HAZARD
TWO YEARS OPERATIONAL EXPERIENCE OF TITAN II ICBM MEDICAL SUPPORT PERSONNEL IN PREVENTING ACCIDENTS FROM OPERATIONAL HAZARDS A66-80567

OPERATIONS RESEARCH
PHYSICAL PARAMETERS OF BIOLOGICAL LIVING SYSTEMS AND THEIR OPERATIONAL RELATIONSHIPS
JPRS-33830 N66-16397

OPTICAL EQUIPMENT
MEASUREMENT OF MUSCLE TREMOR FREQUENCY DISTRIBUTION ASSOCIATED WITH HAND-HELD FIELD GLASSES AND RESOLUTION EFFECTS A66-80576

OPTICAL PROPERTY
OPTICAL PROPERTIES OF AMINO ACIDS USING MASS SPECTROMETRY AND GAS CHROMATOGRAPHY
AFOSR-65-1632 N66-16516

PREFLIGHT, IN-FLIGHT, AND POSTFLIGHT TESTS OF VISUAL ACUITY AND CAPABILITY OF GEMINI V CREW MEMBERS N66-18011

ORGANIC CHEMISTRY
CATALYTIC ACTIVITY AND CHEMICAL PROPERTIES OF POLY-ALPHA-AMINO ACIDS AND POLYNUCLEOTIDES
NASA-CR-70384 N66-17273

ORGANISM
ORGANIC SYSTEMS AND BIOGENESIS - ABSTRACTS
NASA-TT-F-9863 N66-18448

ORTHOSTATIC TOLERANCE
ORTHOSTATIC TOLERANCE AS AFFECTED BY WATER IMMERSION AND BED REST WITH OR WITHOUT PHYSICAL ACTIVITY A66-80558

DEHYDRATION AND WEIGHTLESSNESS IN MANNED SPACE FLIGHT N66-16428

EFFICACY OF CARDIOVASCULAR CONDITIONING WITH PULSATILE LEG CUFF TECHNIQUE IN DECREASING ORTHOSTATIC HYPOTENSION OF GEMINI V ASTRONAUTS N66-18012

OSCILLATION
PENDULUM VERSUS RELAXATION OSCILLATION IN BIOLOGICAL RHYTHM A66-80516

OTOLITH
ARCHITECTURE AND STRUCTURE OF OTOLITH END ORGAN
NASA-CR-70393 N66-17272

EFFECT OF PROLONGED WEIGHTLESSNESS ON OTOLITH FUNCTION AND HORIZONTALITY MEASUREMENTS IN ABSENCE OF GRAVITY AND VISUAL CUES N66-18015

OXYGEN
THERMOREGULATION IN MICE AND HELIUM-OXYGEN ATMOSPHERE CONDUCTIVITY A66-80681

EXPERIMENT TO DETERMINE CHICKEN REACTION TO 100 PERCENT OXYGEN AT ATMOSPHERIC PRESSURE
NASA-CR-60380 N66-18391

OXYGEN BREATHING
PROTECTIVE EFFECT OF HYPERBARIC OXYGENATION IN CEREBRAL ANOXIA IN DOGS A66-80556

EFFECT OF HYPERBARIA AND HYBAROXIA ON CALIBER OF RETINAL AND CEREBRAL VESSELS IN MAN A66-80581

DYNAMIC RESPONSE CHARACTERISTICS OF CHEMOREFLEX ROLE IN VENTILATORY DEPRESSION IN MAN ON ABRUPT ADMINISTRATION OF OXYGEN A66-80594

EFFECT OF SAMPLING TECHNIQUE ON DETERMINATION OF ARTERIAL OXYGEN PRESSURE DURING OXYGEN BREATHING IN MAN A66-80595

REGIONAL BLOOD FLOW TO BRAIN, INTESTINE, AND HIND LIMB AND TOTAL BLOOD FLOW OF DOG BREATHING PURE OXYGEN A66-80605

EFFECT OF PURE OXYGEN BREATHING ON IMMATURE RETINAL VESSELS IN MAN AND EXPERIMENTAL ANIMALS A66-80642

PERMISSIBLE SUPERSATURATION COEFFICIENT IN HUMANS BREATHING AIR AND OXYGEN-HELIUM MIXTURE IN PRESSURE CHAMBER N66-17127

PERMISSIBLE SUPERSATURATION VALUE AFTER INHALATION OF AIR-HELIUM-OXYGEN MIXTURES AND DECOMPRESSION SICKNESS SYMPTOMS N66-17130

CIRCULATING BLOOD VOLUME CHANGES IN DOGS BREATHING OXYGEN UNDER PRESSURE N66-17143

PULMONARY PRESSURE TRAUMA MECHANISM DURING AIR AND OXYGEN BREATHING N66-17153

EFFECT OF OXYGEN BREATHING IN RESORPTION OF GAS EMBOLISM IN VASCULAR SYSTEM OF CATS AND ON COURSE OF PULMONARY PRESSURE TRAUMA N66-17154

OXYGEN CONSUMPTION
NOMOGRAM BY ASTRAND AND RYHMING AS PREDICTOR OF MAXIMUM OXYGEN INTAKE IN MAN DURING SUBMAXIMAL EXERCISE A66-80599

HEART RATE, OXYGEN CONSUMPTION, AND BODY TEMPERATURE AND WEIGHT OF DEHYDRATED SUBJECTS DURING EXERCISE IN HOT ENVIRONMENT A66-80617

NOREPINEPHRINE AND ANGIOTENSIN EFFECTS ON CORONARY FLOW AND MYOCARDIAL OXYGEN CONSUMPTION IN CAT A66-80635

HEART RATE, VENTILATORY VOLUME, OXYGEN COMSUMPTION AND ENERGY EXPENDITURE OF MEN BEFORE, DURING, AND AFTER CLIMBING A66-80687

OXYGEN CONSUMPTION AND SERUM LIPID LEVELS OF BABOON, PAPIO URSINUS, GIVEN SATURATED AND POLYUNSATURATED FAT DIETS A66-80710

ENERGY EXPENDITURE, METABOLIC HEAT PRODUCTION AND OXYGEN CONSUMPTION, AND WORK CAPACITY OF MEN CLOTHED IN SPACE SUITS N66-17395

OXYGEN DEFICIENCY
PRINCIPLES AND RELATIONSHIPS TO REGULATIVE PROCESSES IN HUMANS - OXYGEN DEFICIENCY TESTS
NASA-TT-F-9737 N66-16574

DINITROPHENOL-INDUCED HYPERTHERMIA UNDER ALTERED PARTIAL PRESSURES OF OXYGEN AND CARBON DIOXIDE N66-17150

OXYGEN FLUORIDE
ACUTE INHALATION TOXICITY OF OXYGEN DIFLUORIDE IN ALBINO RAT A66-19723

OXYGEN PRODUCTION
OXYGEN RECOVERY FROM METABOLIC CARBON DIOXIDE FOR SPACECRAFT ENVIRONMENT A66-18821

ROLE OF NUCLEUS IN CYTOPLASMIC DIURNAL RHYTHM OF GREEN ALGAE OXYGEN PRODUCTION A66-80533

EFFECTS OF LIGHT INTENSITY AND CULTURE DENSITY ON ALGAL OXYGEN PRODUCTION
NRL-6331 N66-16214

OXYGEN SYSTEM
OXYGEN SYSTEM FOR CREW OF EXECUTIVE JET AIRCRAFT, USING CONTINUOUS FLOW OF OXYGEN, FIXED CAPACITY RESERVIOR, AND PROVIDING SAFETY PRESSURE
FPRC/MEMO-207 N66-18054

FLIGHT CREW OXYGEN EQUIPMENT DEVELOPED FOR VC 10 TRANSPORT AIRCRAFT
FPRC/MEMO-208 N66-18055

OXYGEN TENSION
EXPERIMENTS WITH ANESTHESIZED DOGS SUBJECTED TO G ACCELERATIONS, OBSERVING BEHAVIOR OF ARTERIAL OXYGEN SATURATION AND PULMONARY VENTILATION DURING SHORT PERIODS A66-19083

EFFECT OF SAMPLING TECHNIQUE ON DETERMINATION OF ARTERIAL OXYGEN PRESSURE DURING OXYGEN BREATHING IN MAN A66-80595

MEASURING BLOOD OXYGEN TENSION WITH MICROCATHODE ELECTRODE A66-80622

POLAROGRAPHIC MEASUREMENT OF BLOOD OXYGEN TENSION AS AFFECTED BY PH, HEPARIN, HEMATOCRIT AND ENVIRONMENTAL TEMPERATURE A66-80623

ROLE OF REFLEXES FROM SINOCAROTID ZONE IN RESPIRATION CONTROL DURING EXCESSIVE INTRAPULMONARY OXYGEN TENSION IN CATS A66-80655

OXYGEN TENSION CHANGES IN BRAIN TISSUE OF RATS SUBJECTED TO TRANSVERSE ACCELERATION A66-80743

OXYGEN TOXICITY
AGE DEPENDENCE OF RESISTANCE OF CHICKENS TO 100 PERCENT OXYGEN AT ONE ATM / OAP/, NOTING DELAYED MORTALITY IN ADULT BIRDS A66-17458

THERAPEUTIC USES OF OXYGEN AT HIGH PRESSURE AND PREVENTION OF ITS TOXICITY IN RATS A66-80644

HYPERBARIC OXYGEN EFFECT ON MICRORGANISMS IN VITRO AND IN LIVE MICE GIVEN INFECTIOUS INJECTIONS N66-16955

RESPIRATORY AND CIRCULATORY CHANGES IN DOGS DURING HIGH PRESSURE OXYGEN TOXICITY N66-17140

PATHOLOGICAL CHARACTERISTICS AND MECHANISM OF PULMONARY INVOLVEMENT IN HIGH PRESSURE OXYGEN TOXICITY IN GUINEA PIGS AND DOGS N66-17141

HEART ACTIVITY DURING HIGH PRESSURE OXYGEN TOXICITY IN DOGS AND GUINEA PIGS - N66-17142

ADSORPTION CHANGES IN NERVOUS SYSTEM AND INTERNAL ORGANS OF MICE DURING OXYGEN-INDUCED CONVULSIONS N66-17144

PRESSURE CHAMBER EXPERIMENTS FOR STUDYING CHANGES IN MOTOR, CADIOVASCULAR, RESPIRATORY, AND CENTRAL NERVOUS SYSTEMS DURING OXYGEN TOXICITY N66-17145

TOXIC EFFECT OF HIGH PARTIAL OXYGEN PRESSURE NOTED IN CONSTRICTION OF PERIPHERAL VISUAL FIELD N66-17162

OXYHEMOGLOBIN
MOSSBAUER EFFECT IN FE57 STUDYING HEMOGLOBIN, OXYHEMOGLOBIN, CARBOHEMOGLOBIN, CARBOXYHEMOGLOBIN, HEMIN, AND HEME OF HUMAN AND RAT BLOOD A66-80646

P

PARTIAL PRESSURE
DINITROPHENOL-INDUCED HYPERTHERMIA UNDER ALTERED PARTIAL PRESSURES OF OXYGEN AND CARBON DIOXIDE N66-17150

TOXIC EFFECT OF HIGH PARTIAL OXYGEN PRESSURE NOTED IN CONSTRICTION OF PERIPHERAL VISUAL FIELD N66-17162

PATHOLOGICAL EFFECT
PATHOLOGICAL CHARACTERISTICS AND MECHANISM OF PULMONARY INVOLVEMENT IN HIGH PRESSURE OXYGEN TOXICITY IN GUINEA PIGS AND DOGS N66-17141

PERCEPTION
SELECTED BIBLIOGRAPHY ON STUDIES IN PERCEPTION A66-80512

PERCEPTUAL REFERENCE FRAME EVALUATION, AND PHYSIOLOGICAL RESPONSES TO UNUSUAL ENVIRONMENTS, AUDITORY SIGNALS, STRUCTURELESS VISUAL FIELD EXPOSURE, AND STIMULI
AD-623869 N66-16506

PERFORMANCE CHARACTERISTICS
VENTILATION, OXYGEN CONSUMPTION, CARDIAC OUTPUT, AND HEART RATE OF ATHLETIC AND NONATHLETIC SUBJECTS EXERCISING AT THREE LEVELS BEFORE AND AFTER TRAINING A66-80607

OPERATIONAL CAPABILITY AND PHYSIOLOGICAL AND CLINICAL APPLICATIONS OF TRANSCUTANEOUS ULTRASONIC BLOOD VELOCITY METER A66-80620

PERFORMANCE OF IMPLANTED ELECTRODE FOR ELECTRO-NYSTAGMOGRAPHY IN SQUIRREL MONKEY A66-80621

MEASURING BLOOD OXYGEN TENSION WITH MICROCATHODE ELECTRODE A66-80622

PERFORMANCE OF EXPOSURE SYSTEM FOR SMALL ANIMALS AT ATMOSPHERIC AND REDUCED PRESSURES A66-80625

PERFORMANCE DECREMENT
HUMAN FACTORS RESEARCH AND DEVELOPMENT DEALING WITH COMMUNICATION AND CONTROL, RECONNAISSANCE, PERFORMANCE DECREMENT IN AIR MOBILITY, AND ARMY AVIATION PERSONNEL AND TRAINING - CONFERENCE
AD-456363 N66-16526

OUTPUT CHARACTERISTICS, PERFORMANCE DECREMENT FROM WEARING PRESSURIZED SUITS, AND LIFE SUPPORT REQUIREMENTS IN SPACE ENVIRONMENT N66-17393

PERIODICITY /BIOL/
SYNCHRONIZATION AND RANGES OF ENTRAINMENT IN CIRCADIAN RHYTHM A66-80527

PHASE-ANGLE DIFFERENCE IN CIRCADIAN PERIODICITY OF ORGANISM AND ENVIRONMENTAL PERIODICITY A66-80538

MECHANISM OF ENTRAINMENT OF CIRCADIAN RHYTHM BY LIGHT CYCLES USING DROSOPHILA PUPAL ECLOSION RHYTHM AS MODEL A66-80539

RELATIONSHIP BETWEEN PLANT PHOTOPERIODICITY AND CIRCADIAN RHYTHM A66-80541

CIRCADIAN SYSTEMS OF METABOLISM AND TESTICULAR RESPONSE IN PHOTOPERIODIC RESPONSES IN VERTEBRATES A66-80542

CIRCADIAN RHYTHM AND PHOTOPERIODIC REGULATION OF ANNUAL REPRODUCTIVE CYCLE IN BIRDS A66-80544

CIRCADIAN RHYTHM OF TESTICULAR RESPONSE AND PHOTOPERIODICITY IN HOUSE SPARROW, PASSER DOMESTICUS A66-80546

BIOLOGICAL RHYTHM, ENVIRONMENTAL PERIODICITIES,

AND MATHEMATICAL MODELS A66-80550

PERMEABILITY
PERMEABILITY MEASUREMENTS FOR DIFFUSION OF CARBON DIOXIDE AND GLUCOSE THROUGH SILICON RUBBER AND TEFLON IN STUDY OF ENZYMATIC BREAKDOWN PRODUCTS SEPARATION
NASA-CR-70190 N66-16968

PERSONALITY
VIGILANCE PERFORMANCE OF MEN WITH DIFFERENT TYPES OF CENTRAL NERVOUS SYSTEM A66-80734

PERSONNEL
MICROORGANIC CONTAMINATION OF STAINLESS STEEL DUE TO HANDLING BY PERSONNEL
NASA-TM-X-55408 N66-17240

PERSONNEL SELECTION
PREDICTION FORMULAE FOR PERSONNEL SELECTION BASED ON PROCUREMENT SOURCE AND SUCCESS OF OFFICER FLIGHT STUDENTS
AD-623826 N66-16503

VALIDITY OF BRIEF VESTIBULAR DISORIENTATION TEST IN SCREENING PILOT TRAINEES
NASA-CR-70146 N66-16603

PERSONNEL SUBSYSTEM
HUMAN PERFORMANCE AND BEHAVIOR ASSESSMENT IN AIR FORCE SYSTEMS AND SUBSYSTEMS
SSD-65-172/514/R N66-16664

PH
EFFECT OF BLOOD HYDROGEN ION CONCENTRATION ON HYPOXIC PULMONARY VASOCONSTRICTION IN DOGS A66-80586

OXYGEN PRESSURE VENTILATION RESPONSE CURVE WITH NORMAL HYDROGEN ION CONCENTRATION AND CARBON DIOXIDE PRESSURE IN DOGS A66-80592

POLAROGRAPHIC MEASUREMENT OF BLOOD OXYGEN TENSION AS AFFECTED BY PH, HEPARIN, HEMATOCRIT AND ENVIRONMENTAL TEMPERATURE A66-80623

ELECTROMETRIC SURFACE PH OF ISCHEMIC KIDNEY AND EFFECT OF HYPOTHERMIA IN DOGS AND RABBITS A66-80629

DEFECT OF URINARY ACIDIFICATION DURING FASTING IN MAN A66-80631

PHARMACOLOGY
SYSTEM COSTS AND PHARMACOLOGICAL TECHNIQUES AS FUNCTION OF EXERCISE PROGRAM DESIGNED TO MAINTAIN SPACE CREW PHYSICAL FITNESS A66-17658

PHYSIOLOGICAL RESPONSES TO ANTIMOTION SICKNESS DRUGS - ANTIHISTAMINES, BELLADONNAS, AND PHENOTHIAZINES
NASA-CR-70175 N66-16971

PHASE CONTROL
PHASE-ANGLE DIFFERENCE IN CIRCADIAN PERIODICITY OF ORGANISM AND ENVIRONMENTAL PERIODICITY A66-80538

PHASE DIAGRAM
LOGIC DIAGRAMS OF PILOT ACTION IN EMERGENCY SITUATION
JPRS-34200 N66-17638

PHASE SHIFT
RESPONSE CURVES IN CIRCADIAN PERIODICITY - SYNCHRONIZATION AND PHASE SHIFT IN ANIMALS AND PLANTS A66-80526

SHIFT IN CIRCADIAN RHYTHM PHASES IN CANARY, SERINUS CANARIUS, IN SELF-SELECTION, IMPOSED DARKNESS, AND AFTER ADMINISTRATION OF RESERPINE AND TRIIODOTHYRONINE A66-80543

PHASE SHIFTING OF HUMAN CIRCADIAN SYSTEM DURING TRANSCONTINENTAL JET FLIGHTS A66-80547

PHENOTHIAZINE
SUPPRESSION OF MOTION SICKNESS BY THIETHYLPERAZINE A66-80570

PHYSIOLOGICAL RESPONSES TO ANTIMOTION SICKNESS DRUGS - ANTIHISTAMINES, BELLADONNAS, AND PHENOTHIAZINES
NASA-CR-70175 N66-16971

PHOSPHORUS
EFFECT OF HIGH-FREQUENCY VIBRATIONS ON ABSORPTION OF RADIOACTIVE PHOSPHORUS IN INTESTINE, IN DOGS A66-80744

PHOTIC STIMULATION
MECHANISM OF ENTRAINMENT OF CIRCADIAN RHYTHM BY LIGHT CYCLES USING DROSOPHILA PUPAL ECLOSION RHYTHM AS MODEL A66-80539

TEMPORAL SUMMATION OF POSITIVE AND NEGATIVE FLASHES IN VISUAL SYSTEM AND INHIBITION BY DOUBLE POSITIVE OR DOUBLE NEGATIVE FLASHES A66-80577

VISUALLY EVOKED CORTICAL RESPONSE CORRELATES OF PERCEPTUAL MASKING AND ENHANCEMENT A66-80578

AMPLITUDE OF PHOTICALLY EVOKED POTENTIALS BY CONDITIONED STIMULUS IN CAT A66-80580

AVERAGED ELECTRICAL RESPONSES TO DIFFUSE AND TO PATTERNED LIGHT IN HUMAN A66-80671

CATEGORY JUDGMENTS AS FUNCTIONS OF FLASH LUMINANCE AND DURATION A66-80673

PHOTOGRAPH INTERPRETATION
RIGHTS AND ERRORS KEYS AS REFERENCE SYSTEM FOR IMAGE INTERPRETATION BY HUMAN OPERATORS N66-16528

PHOTOGRAPHIC MEASUREMENT
HIGH ENERGY ELECTRON PHOTOGRAPHIC ISODOSE MEASUREMENTS IN INHOMOGENEOUS MEDIA
CONF-640918-2 N66-17546

PHOTOGRAPHIC RECORDING INSTRUMENT
INFLUENCE OF EYE LID MOVEMENT UPON ELECTRO-OCULOGRAPHIC RECORDING OF VERTICAL SACCADIC EYE MOVEMENTS A66-17662

PHOTON ABSORPTION
BONE MINERAL MEASUREMENTS BY PHOTON ABSORPTION WITH IMPROVED SCANNING DEVICE N66-17674

PHOTON BEAM
BONE MINERAL CONTENT IN DOMESTIC HEN MEASURED BY ATTENUATION OF MONOENERGETIC PHOTON BEAM N66-17675

PHOTORECEPTOR
INDICATOR OF RAT*S RETINAL RECEPTOR RESPONSE - HISTOLOGICAL STAINING REACTION A66-80679

PHOTOSYNTHESIS
MOLECULAR ASPECTS OF CIRCADIAN SYSTEMS IN MITOSIS AND PHOTOSYNTHESIS IN MICROORGANISMS A66-80531

BIOCHEMICAL FACTORS IN PHOTOSYNTHESIS RHYTHM IN ALGAE, GONYAULAX POLYEDRA A66-80532

PHYSICAL ENDURANCE
INFANTILE TREADMILL EXPERIENCE EFFECT ON BODY WEIGHT AND RESISTANCE TO EXHAUSTION IN RAT A66-17460

PHYSICAL EXAMINATION
TREATMENT OF SEVERE SPINAL FORM OF DECOMPRESSION SICKNESS N66-17161

PHYSICAL EXERCISE
CIRCULATORY EFFECTS OF CAROTID ARTERY STRETCH RECEPTORS STIMULATION IN MAN AT REST AND DURING EXERCISE A66-80555

ORTHOSTATIC TOLERANCE AS AFFECTED BY WATER IMMERSION AND BED REST WITH OR WITHOUT PHYSICAL ACTIVITY A66-80558

NOMOGRAM BY ASTRAND AND RYHMING AS PREDICTOR OF

MAXIMUM OXYGEN INTAKE IN MAN DURING SUBMAXIMAL EXERCISE A66-80599

PULMONARY DIFFUSION AND CAPILLARY BLOOD VOLUME IN DOGS AT REST AND WITH EXERCISE A66-80600

BLOOD, PLASMA, AND RED CELL VOLUMES OF YOUNG AND OLD MEN DURING REST AND EXERCISE IN DESERT ENVIRONMENT AND AT HIGH ALTITUDE A66-80606

VENTILATION, OXYGEN CONSUMPTION, CARDIAC OUTPUT, AND HEART RATE OF ATHLETIC AND NONATHLETIC SUBJECTS EXERCISING AT THREE LEVELS BEFORE AND AFTER TRAINING A66-80607

CARDIAC OUTPUT IN MAN AT REST AND AT WORK DURING AND AFTER ACCLIMATIZATION TO 3,800 METERS A66-80608

PLASMA AND SWEAT HISTAMINE CONCENTRATIONS OF HUMAN SUBJECTS AFTER HEAT EXPOSURE AND PHYSICAL EXERCISE A66-80611

ROLE OF PHYSICAL CONDITIONING IN ACCLIMATIZATION OF HUMAN SUBJECTS WORKING IN HUMID HEAT A66-80612

TIME FOR ACCLIMATIZATION OF HEALTHY YOUNG EXERCISING MEN TO HOT, WET ENVIRONMENT A66-80616

HEART RATE, OXYGEN CONSUMPTION, AND BODY TEMPERATURE AND WEIGHT OF DEHYDRATED SUBJECTS DURING EXERCISE IN HOT ENVIRONMENT A66-80617

MUSCULAR ORIGIN OF ELEVATED PLASMA POTASSIUM DURING PHYSICAL EXERCISE IN MAN A66-80618

BASIC PATTERNS AND VARIATIONS IN ELECTROCARDIOGRAPHIC RECORDS OF 37 SUBJECTS DURING NORMAL ACTIVITY OVER FOUR YEAR PERIOD A66-80627

EFFECT OF STARVATION AND PROLONGED EXERCISE ON FATTY ACID COMPOSITION IN ADIPOSE TISSUE AND EFFECT OF ADRENALIN ON COMPOSITION OF FATTY ACIDS RELEASED BY ADIPOSE TISSUE IN VITRO IN RATS A66-80651

SERUM IRON IN ATHLETES AND UNTRAINED SUBJECTS AFTER PHYSICAL EXERCISE A66-80660

CONCENTRATION AND DILUTION OF URINE IN PERMANENT INHABITANTS AT REST AND EXERCISE IN HOT ENVIRONMENT AS RELATED TO FLUID INTAKE A66-80685

EVALUATION OF PHYSICAL CONDITION OF GEMINI V ASTRONAUTS BY CARDIOVASCULAR SYSTEM RESPONSE TO CALIBRATED WORK LOAD N66-18013

PHYSICAL FITNESS

SYSTEM COSTS AND PHARMACOLOGICAL TECHNIQUES AS FUNCTION OF EXERCISE PROGRAM DESIGNED TO MAINTAIN SPACE CREW PHYSICAL FITNESS A66-17658

VENTILATION, OXYGEN CONSUMPTION, CARDIAC OUTPUT, AND HEART RATE OF ATHLETIC AND NONATHLETIC SUBJECTS EXERCISING AT THREE LEVELS BEFORE AND AFTER TRAINING A66-80607

ROLE OF PHYSICAL CONDITIONING IN ACCLIMATIZATION OF HUMAN SUBJECTS WORKING IN HUMID HEAT A66-80612

METHODS FOR EVALUATION OF PHYSICAL FITNESS A66-80730

PHYSICAL PROPERTY

PHYSICAL AND CHEMICAL PROPERTIES OF ALPHA-LACTALBUMIN CRYSTALS PREPARED FROM GOAT MILK N66-16363

PHYSICAL AND CHEMICAL PROPERTIES BY SEDIMENTATION AND SPECTRAL ANALYSIS FOR PURIFIED STAPHYLOCOCCAL ENTEROTOXIN B AD-444380 N66-17644

PHYSIOLOGICAL DEFENSE

SYNTHESIS FRAMEWORK OF EXPERIMENT PROGRAM FOR ORBITING RESEARCH LABORATORIES APPLIED TO BIOMEDICINE/BEHAVIOR TO ASSURE PHYSIOLOGICAL SAFETY ON ADVANCED SPACE MISSIONS NASA-CR-70356 N66-17053

PHYSIOLOGICAL EFFECT

L F AND INFRASONIC NOISE EFFECTS ON MANS CARDIAC RHYTHM, HEARING, VISION, MOTOR CONTROL, SPATIAL ORIENTATION, SPEECH AND SUBJECTIVE TOLERANCE A66-17656

BIOMEDICAL SURVEY OF AIR TRAFFIC CONTROL FACILITIES - RELATIONSHIP OF EXPERIENCE AND AGING TO INCIDENCE OF STRESS SYMPTOMS AM-65-6 N66-16669

PHYSIOLOGICAL ENERGY EXPENDITURE FROM DONNING FULL PRESSURE SUIT UNDER SPACE AND TIME LIMITATIONS N66-17394

EFFECT OF WEIGHTLESSNESS AND IMMOBILIZATION ON BONE DEMINERALIZATION OF PRIMARY AND BACKUP GEMINI V CREW USING RADIOGRAPHIC BONE DENSITOMETRY N66-18014

EFFECT OF PROLONGED WEIGHTLESSNESS ON OTOLITH FUNCTION AND HORIZONTALITY MEASUREMENTS IN ABSENCE OF GRAVITY AND VISUAL CUES N66-18015

PHYSIOLOGICAL INDEX

PREFLIGHT, IN-FLIGHT, AND POSTFLIGHT TESTS OF VISUAL ACUITY AND CAPABILITY OF GEMINI V CREW MEMBERS N66-18011

PHYSIOLOGICAL RESPONSE

EFFECT OF EXTREMES IN MAGNETIC ENVIRONMENT ON PHYSIOLOGICAL BEHAVIOR A66-18585

PHYSIOLOGICAL REACTIONS OF HUMAN BODY TO TRANSVERSE ACCELERATION AND MEANS OF INCREASING RESISTANCE A66-80560

PERCEPTUAL REFERENCE FRAME EVALUATION, AND PHYSIOLOGICAL RESPONSES TO UNUSUAL ENVIRONMENTS, AUDITORY SIGNALS, STRUCTURELESS VISUAL FIELD EXPOSURE, AND STIMULI AD-623869 N66-16506

EFFECTS OF CHANGING LOCATION OF VISUAL STIMULI ON SIMPLE REACTION TIMES OF ADULTS WITH NORMAL VISION N66-16539

GALVANIC SKIN RESPONSE, HEART RATE, AND MUSCLE ACTION BIOELECTRIC POTENTIAL SIGNALS AS PSYCHOPHYSIOLOGICAL RESPONSE TO LEARNING TASK DIFFICULTY NAVTRADEVCEN-IH-34 N66-16639

PHYSIOLOGICAL RESPONSES TO ANTIMOTION SICKNESS DRUGS - ANTIHISTAMINES, BELLADONNAS, AND PHENOTHIAZINES NASA-CR-70175 N66-16971

PHYSIOLOGICAL RESPONSES IN HUMANS AND ANIMALS TO AIR EMBOLISMS AND PRESSURE ENVIRONMENTS IN DECOMPRESSION SICKNESS STUDIES NASA-TT-F-358 N66-17126

DECOMPRESSION AIR EMBOLIC PROCESS IN ANIMALS AND PHYSIOLOGICAL RESPONSES N66-17133

PHYSIOLOGICAL RESPONSES IN RABBITS TO ARTIFICIAL EMBOLISM DUE TO INJECTIONS OF CARBON DIOXIDE, OXYGEN, AIR, AND HELIUM-OXYGEN MIXTURE N66-17134

VESTIBULAR SENSITIVITY AND ASSOCIATED LOCOMOTOR RESPONSES OF RATS IN ROTATING ENVIRONMENT NASA-CR-70394 N66-17271

ROLE OF PITUITARY AND ADRENAL GLANDS IN GENESIS OF AND RECOVERY FROM RADIATION PATHOLOGICAL SYMPTOMS JPRS-34120 N66-17623

PHYSIOLOGICAL RESPONSE OF GERM CELLS IN FLOWER BEETLES, TRIBOLIUM CASTANEUM, TO X-RAY IRRADIATION
HW-SA-3747 N66-17833

EFFICACY OF CARDIOVASCULAR CONDITIONING WITH PULSATILE LEG CUFF TECHNIQUE IN DECREASING ORTHOSTATIC HYPOTENSION OF GEMINI V ASTRONAUTS
N66-18012

EVALUATION OF PHYSICAL CONDITION OF GEMINI V ASTRONAUTS BY CARDIOVASCULAR SYSTEM RESPONSE TO CALIBRATED WORK LOAD N66-18013

PSYCHOPHYSIOLOGICAL RESPONSES IN HUMANS TO LOW FREQUENCY PRESSURE OSCILLATIONS
NASA-TN-D-3323 N66-18432

PHYSIOLOGICAL TELEMETRY
USE OF METHODS OF CORRELATION ANALYSIS FOR STUDY OF TELEMETRIC DATA OF CARDIOVASCULAR SYSTEM RESPONSES DURING FLIGHT OF VOSKHOD I SPACECRAFT
A66-80745

PHYSIOLOGY
PHYSIOLOGICAL AND CLINICAL APPLICATIONS OF TRANSCUTANEOUS DOPPLER FLOWMETER APPLYING TRANSDUCER TO SKIN SURFACE OVER STRATEGIC SITES TO INDICATE BLOOD FLOW VELOCITY A66-80604

OPERATIONAL CAPABILITY AND PHYSIOLOGICAL AND CLINICAL APPLICATIONS OF TRANSCUTANEOUS ULTRASONIC BLOOD VELOCITY METER A66-80620

ONE-STAGE MODEL FOR VISUAL TEMPORAL INTEGRATION
A66-80676

MORPHOLOGY AND FUNCTION OF SLEEP PHYSIOLOGY
A66-80688

PSYCHOLOGICAL AND PHYSIOLOGICAL TESTING IN SUCCESS PREDICTION IN FLIGHT TRAINING PROGRAMS
NASA-CR-69895 N66-16192

PHYSIOLOGY OF CHRONIC ADAPTATION TO HIGH ELEVATIONS - ACCLIMIZATION
JPRS-33871 N66-16325

DEHYDRATION AND WEIGHTLESSNESS IN MANNED SPACE FLIGHT N66-16428

BEHAVIOR REFLEX REGULATION OF DECORTICATE CAT, NEURAL MECHANISMS RESPONSIBLE FOR DEEP SLEEP, AND REFLEXES IN CIRCULATION REGULATION DURING SLEEP
AFOSR-65-1579 N66-16469

RENAL BLOOD FLOW AND EXTRACELLULAR VOLUME, RENAL AND CARDIAC EFFECTS ON SODIUM EXCRETION, AND ABNORMAL CIRCULATORY STATE EFFECTS ON CARDIAC RATE AND BLOOD PRESSURE - DOG & HUMAN PHYSIOLOGY
NASA-CR-70316 N66-17072

LONG TERM HEMODYNAMIC CHANGES IN DOGS UNDER HIGH PARTIAL PRESSURE OF OXYGEN N66-17146

PIGEON
DETERMINATION OF THRESHOLD EXCITABILITY OF SEMICIRCULAR CANALS WITH THERMAL STIMULATION METHOD IN PIGEONS A66-80738

PILOT
AIRCRAFT ACCIDENTS AND DISORIENTATION EXPERIENCES OF ARMY HELICOPTER PILOTS AS RELATED TO TRAINING AND INSTRUMENT DESIGN A66-80563

ALTERNOBARIC VERTIGO AMONG SWEDISH PILOTS AS RELATED TO COLDS AND ABILITY TO EQUALIZE MIDDLE EAR PRESSURE A66-80569

VISUAL PERCEPTION DURING POST-ROTATORY NYSTAGMUS IN PILOTS A66-80718

ELECTROENCEPHALOGRAMS OF EXPERIENCED PILOTS, PILOT CANDIDATES, AND NON-PILOTS A66-80719

USEFULNESS AND LIMITATIONS OF NELSON TEST METHOD FOR SYPHILIS IN DETERMINING FLIGHT FITNESS IN PILOTS A66-80720

RETINAL DETACHMENT IN PILOT INCURRED IN FLIGHT - CASE HISTORY A66-80728

PILOT PERFORMANCE
MORPHOLOGICAL CHARACTERISTICS AND FUNCTIONAL DATA IN PILOT TRAINEES, NOTING ANTHROPOMETRIC DATA AND VITAL CAPACITY, OXYGEN INTAKE, HEART RATE, ETC
A66-19084

AVIATOR PERFORMANCE IN LIGHT WEAPONS HELICOPTER DURING NAP-OF-EARTH FLIGHT SIMULATED COMBAT MISSION N66-16533

CYCLIC GRIP FOR HELICOPTER CONTROL - HUMAN ENGINEERING DESIGN STUDY N66-16537

TASK LOADING EFFECTS ON PILOT PERFORMANCE DURING SIMULATED LOW ALTITUDE, HIGH SPEED, TERRAIN FOLLOWING MISSIONS N66-16540

MISSION, PERSONNEL, AND HARDWARE DEMANDS OF LOW ALTITUDE NAVIGATION N66-16541

TRACKING STUDY TO DETERMINE MAXIMUM CONTROL ELEMENT LAG AND MAXIMUM AND MINIMUM CONTROL SENSITIVITY TOLERATED IN MANUALLY CONTROLLED COMPENSATORY TRACKING TASK
NASA-TN-D-3242 N66-16548

POWERED TRIM CHANGES AFFECTING PILOT DURING SIMULATED LANDING FOR SHORT TAKE OFF AND LANDING AIRCRAFT
NASA-TN-D-3246 N66-16550

REVISION IN CINEMA METHOD IMPROVES GEOGRAPHIC ORIENTATION IN AIRCRAFT PILOTS DURING SIMULATED LOW ALTITUDE FLIGHT
TR-751-5 N66-17587

LOGIC DIAGRAMS OF PILOT ACTION IN EMERGENCY SITUATION
JPRS-34200 N66-17638

PILOT SELECTION
VALIDITY OF BRIEF VESTIBULAR DISORIENTATION TEST IN SCREENING PILOT TRAINEES A66-80559

PREDICTING PILOT SUCCESS IN FIXED AND ROTARY WING AVIATION TRAINING BY USE OF TEST BATTERIES
N66-16543

VALIDITY OF BRIEF VESTIBULAR DISORIENTATION TEST IN SCREENING PILOT TRAINEES
NASA-CR-70146 N66-16603

VESTIBULAR DISORIENTATION TEST VALIDITY IN SCREENING PILOT TRAINEES
NASA-CR-70306 N66-17079

PILOT TRAINING
MARINE PILOT TRAINING TO DEVELOP VISUAL HABIT PATTERNS AS AID IN REDUCING MID-AIR COLLISION HAZARDS A66-17712

TRAINING AND SELECTION PROCEDURES USED AT USAF AEROSPACE RESEARCH PILOT SCHOOL
A66-18579

CONTROL ANALOG VERTICAL ATTITUDE INDICATOR AND VTOL FLIGHT DISPLAY FOR HELICOPTER PILOT TRAINING N66-16536

ARMY AVIATION CAREER PROGRAM AND AVIATOR PERSONNEL REQUIREMENTS THROUGH 1968 N66-16542

DAY-TO-DAY OPERATIONAL QUALITY CONTROL PROGRAM USED IN THE TRAINING OF ARMY HELICOPTER PILOTS
N66-16544

PITUITARY GLAND
ROLE OF PITUITARY AND ADRENAL GLANDS IN GENESIS OF AND RECOVERY FROM RADIATION PATHOLOGICAL SYMPTOMS
JPRS-34120 N66-17623

PLANET
DEFINITIONS OF LIFE ON EARTH, AND HABITABILITY OF OTHER PLANETS IN UNIVERSE
JPRS-34259 N66-18064

PLANT /BIOL/
SUMMARIES OF RESEARCH AND PRESENT KNOWLEDGE OF BIOLOGICAL RHYTHMS IN PLANTS AND ANIMALS A66-80514

RESPONSE CURVES IN CIRCADIAN PERIODICITY - SYNCHRONIZATION AND PHASE SHIFT IN ANIMALS AND PLANTS A66-80526

CELL DIVISION RHYTHM AND CIRCADIAN CLOCK IN PLANTS AND ANIMALS A66-80529

EFFECT OF TEMPERATURE VARIATIONS ON BIOLOGICAL CLOCKS IN PLANTS AND ANIMALS A66-80530

UNIFIED THEORY FOR BIOLOGICAL RHYTHMS - ENVIRONMENTAL PERIODICITIES AS TIMERS ON PLANT AND ANIMAL RHYTHMS A66-80537

RELATIONSHIP BETWEEN PLANT PHOTOPERIODICITY AND CIRCADIAN RHYTHM A66-80541

PROTECTION FROM IONIZING RADIATION UNDER HYPOXIC CONDITIONS IN PLANTS AND ANIMALS A66-80682

MONOCHROMATIC RED, WHITE, GREEN, AND BLUE SOLAR LIGHT RADIATION EFFECT ON PLANT GROWTH, DEVELOPMENT, AND YIELD N66-16275

PLUTONIUM 238
BIOLOGICAL RADIATION EXPOSURE STUDIES - LARGE PARTICLE INHALATION IN DOGS, INTRAGASTRIC AND SKIN EXPOSURE IN PIGS, INGESTED PARTICLES IN RATS, AND PLUTONIUM 28 INGESTION RATS
NASA-CR-70520 N66-18157

PNEUMATIC EQUIPMENT
EFFICACY OF CARDIOVASCULAR CONDITIONING WITH PULSATILE LEG CUFF TECHNIQUE IN DECREASING ORTHOSTATIC HYPOTENSION OF GEMINI V ASTRONAUTS N66-18012

POINT SOURCE
EFFECTS OF HIGH LUMINANCE SOURCES UPON VISIBILITY OF POINT SOURCES
NASA-TM-X-56561 N66-18332

POLYNUCLEOTIDE
CATALYTIC ACTIVITY AND CHEMICAL PROPERTIES OF POLY-ALPHA-AMINO ACIDS AND POLYNUCLEOTIDES
NASA-CR-70384 N66-17273

POLYSACCHARIDE
DECOMPRESSION SICKNESS OF DOGS AS AFFECTED BY PLASMA REPLACEMENT BY DEXTRAN AND HYPOTHERMIA A66-80668

POSTURE
INTERACTIONS BETWEEN OPTOKINETIC AND VESTIBULO-OCULAR RESPONSES DURING HEAD ROTATION IN VARIOUS PLANES A66-80568

INFLUENCE OF POSTURE AND DIURNAL RHYTHM ON RENAL EXCRETION OF ACID IN NORMAL MEN AND ADRENALECTOMIZED PATIENTS A66-80632

ELECTROCARDIOGRAPHIC STUDY AND COURSE OF ARTERIAL PRESSURE AT VARIOUS BODY POSITIONS ON TILTING TABLE A66-80712

VARIATIONS OF P-WAVE OF ELECTROCARDIOGRAM IN RELATION TO CHANGES OF BODY POSITION A66-80713

COURSE OF P-WAVE IN RELATION TO BODY POSITION IN RABBIT - PRESSORECEPTOR EFFECT A66-80714

POTASSIUM
MUSCULAR ORIGIN OF ELEVATED PLASMA POTASSIUM DURING PHYSICAL EXERCISE IN MAN A66-80618

NEUTRON ACTIVATION AND SCINTILLATION COUNTERS FOR DETECTION OF SODIUM AND POTASSIUM IN BIOLOGICAL MEDIA
CEA-R-2837 N66-17491

PREDICTION THEORY
PREDICTION FORMULAE FOR PERSONNEL SELECTION BASED ON PROCUREMENT SOURCE AND SUCCESS OF OFFICER FLIGHT STUDENTS
AD-623826 N66-16503

PREFLIGHT ANALYSIS
TECHNIQUE FOR PERFORMING MISSION ANALYSIS ON FIXED AND ROTARY WING AIRCRAFT N66-16538

PRESSURE
RELATIONSHIP OF AIR FLOW TO ESOPHAGEAL PRESSURE DURING MAXIMAL RESPIRATORY EFFORT IN MAN A66-80596

OXYGEN SYSTEM FOR CREW OF EXECUTIVE JET AIRCRAFT, USING CONTINUOUS FLOW OF OXYGEN, FIXED CAPACITY RESERVIOR, AND PROVIDING SAFETY PRESSURE
FPRC/MEMO-207 N66-18054

PRESSURE BREATHING
PROTECTIVE EFFECT OF HYPERBARIC OXYGENATION IN CEREBRAL ANOXIA IN DOGS A66-80556

EFFECT OF HYPERBARIA AND HYBAROXIA ON CALIBER OF RETINAL AND CEREBRAL VESSELS IN MAN A66-80581

THERAPEUTIC USES OF OXYGEN AT HIGH PRESSURE AND PREVENTION OF ITS TOXICITY IN RATS A66-80644

PULMONARY PRESSURE TRAUMA MECHANISM DURING AIR AND OXYGEN BREATHING N66-17153

PRESSURE CHAMBER
PERFORMANCE OF EXPOSURE SYSTEM FOR SMALL ANIMALS AT ATMOSPHERIC AND REDUCED PRESSURES A66-80625

PERMISSIBLE SUPERSATURATION COEFFICIENT IN HUMANS BREATHING AIR AND OXYGEN-HELIUM MIXTURE IN PRESSURE CHAMBER N66-17127

PRESSURE CHAMBER EXPERIMENTS FOR STUDYING CHANGES IN MOTOR, CADIOVASCULAR, RESPIRATORY, AND CENTRAL NERVOUS SYSTEMS DURING OXYGEN TOXICITY N66-17145

PRESSURE EFFECT
INHALATION TOXICITY AT AMBIENT AND REDUCED PRESSURES IN MONKEYS, DOGS AND RODENTS UPON EXPOSURE TO OZONE, NITROGEN DIOXIDE AND CARBON TETRACHLORIDE A66-19724

HUMAN BODY ADAPTIVE REACTION TO INCREASED AIR PRESSURE BASED ON HIGHER NERVOUS SYSTEM STUDY N66-17152

PRESSURE OSCILLATION
PSYCHOPHYSIOLOGICAL RESPONSES IN HUMANS TO LOW FREQUENCY PRESSURE OSCILLATIONS
NASA-TN-D-3323 N66-18432

PRESSURIZED SUIT
METABOLIC RATES IN PRESSURIZED PRESSURE SUIT, AFFECTING HEAT BALANCE OF SUBJECTS METABOLIC HEAT WITH HEAT REMOVED BY ENVIRONMENTAL CONTROL A66-17657

SOVIET HIGH ALTITUDE PRESSURE-SUIT DEVELOPMENT, TESTING AND USE, 1934-1955 A66-17666

PRESSURIZED SPACE SUITS TO SIMULATE WEIGHTLESSNESS AT ZERO GRAVITY - EFFECT OF CLOTHING CONSTRAINTS ON HUMAN PERFORMANCE
REL-HFG-65-1 N66-17386

PORTABLE LIFE SUPPORT SYSTEM AND PRESSURIZED SUIT FOR EXTRAVEHICULAR MOBILITY UNIT TO PROTECT MAN AGAINST LUNAR SURFACE AND FREE SPACE HAZARDS N66-17387

HUMAN PERFORMANCE IN PRESSURIZED SUITS UNDER ZERO GRAVITY CONDITIONS N66-17388

MAINTENANCE OF SPACE VEHICLES DURING SHORT PERIODS OF SIMULATED WEIGHTLESSNESS BY WORKERS WEARING

PRESSURIZED SUITS N66-17389

PRESSURIZED SPACE SUIT EFFECTS ON HUMAN PERFORMANCE IN FRICTIONLESS ENVIRONMENT N66-17392

OUTPUT CHARACTERISTICS, PERFORMANCE DECREMENT FROM WEARING PRESSURIZED SUITS, AND LIFE SUPPORT REQUIREMENTS IN SPACE ENVIRONMENT N66-17393

PHYSIOLOGICAL ENERGY EXPENDITURE FROM DONNING FULL PRESSURE SUIT UNDER SPACE AND TIME LIMITATIONS N66-17394

PROTECTION
EXPERIMENTS WITH ANTIHYPEROXIC PHARMACOPROTECTION IN RATS A66-80715

PROTECTIVE CLOTHING
PASSIVE TEMPERATURE CONTROL FOR EXTRAVEHICULAR SPACE SUITS
AMRL-TR-65-156 N66-16743

SPACE SUIT DEVELOPMENT STATUS
NASA-TN-D-3291 N66-16942

PROTEIN
INTERACTION OF DIETARY PROTEIN AND CALCIUM ON GROWTH AND MAINTENANCE OF BONES OF YOUNG, ADULT, AND AGED RATS A66-80711

PROTON IRRADIATION
SOLID CHEMICAL SYSTEM FOR CHARGED PARTICLE DOSIMETRY
NASA-CR-70462 N66-17481

PSYCHOLOGICAL EFFECT
BIOMEDICAL SURVEY OF AIR TRAFFIC CONTROL FACILITIES - RELATIONSHIP OF EXPERIENCE AND AGING TO INCIDENCE OF STRESS SYMPTOMS
AM-65-6 N66-16669

PSYCHOLOGICAL FACTOR
ENVIRONMENT CONCEPT AS PSYCHOLOGICAL FACTOR, AND PERTINENT LITERATURE REVIEW
TR-33 N66-16507

PSYCHOLOGICAL TESTING
CARBON DIOXIDE INDUCED MILD HYPOXIA, CORRECTION OF ALTERATIONS ON PERFORMANCE OF PSYCHOLOGIC AND PSYCHOMOTOR SYSTEMS A66-17661

AGING EFFECT ON INTELLIGENCE TEST SCORES A66-80584

PSYCHOLOGICAL AND PHYSIOLOGICAL TESTING IN SUCCESS PREDICTION IN FLIGHT TRAINING PROGRAMS
NASA-CR-69895 N66-16192

FIELD CRITERION TEST TO ASSESS SCANNING AND TARGET IDENTIFICATION SKILLS OF COMBAT ARMS OFFICERS N66-16530

PREDICTING PILOT SUCCESS IN FIXED AND ROTARY WING AVIATION TRAINING BY USE OF TEST BATTERIES N66-16543

SELF-REPORTED SYMPTOM INCIDENCE OF AIR TRAFFIC CONTROL PERSONNEL
AM-65-5 N66-16584

PSYCHOLOGY /GEN/
PSYCHOLOGY AND DISPLAY SYSTEM DESIGN A66-80708

PERCEPTUAL REFERENCE FRAME EVALUATION, AND PHYSIOLOGICAL RESPONSES TO UNUSUAL ENVIRONMENTS, AUDITORY SIGNALS, STRUCTURELESS VISUAL FIELD EXPOSURE, AND STIMULI
AD-623869 N66-16506

PSYCHOMOTOR PERFORMANCE
CARBON DIOXIDE INDUCED MILD HYPOXIA, CORRECTION OF ALTERATIONS ON PERFORMANCE OF PSYCHOLOGIC AND PSYCHOMOTOR SYSTEMS A66-17661

REMOTE MANIPULATION TASK PERFORMANCE AS AFFECTED BY TRANSMISSION DELAY A66-80513

INFLUNCE OF MODERATE ALCOHOLEMIC VALUES ON SOME ASPECTS OF PSYCHOMOTOR REACTIVITY A66-80727

PSYCHOPHYSICS
PRECISION OF COLOR DIFFERENCES DERIVED FROM MULTIDIMENSIONAL SCALING EXPERIMENT A66-80672

CATEGORY JUDGMENTS AS FUNCTIONS OF FLASH LUMINANCE AND DURATION A66-80673

ONE-STAGE MODEL FOR VISUAL TEMPORAL INTEGRATION A66-80676

RELATIONAL DETERMINATION OF BEHAVIOR, AND SIGNIFICANT RELATIONSHIPS BETWEEN RESPONSE VARIABLES AND BEHAVIORALLY EFFECTIVE PROPERTIES OF STIMULI
TR-35 N66-16509

PSYCHOPHYSIOLOGY
AUTOMATIC DATA PROCESSING IN PSYCHOPHYSIOLOGY - SYSTEM IN OPERATION A66-80638

GALVANIC SKIN RESPONSE, HEART RATE, AND MUSCLE ACTION BIOELECTRIC POTENTIAL SIGNALS AS PSYCHOPHYSIOLOGICAL RESPONSE TO LEARNING TASK DIFFICULTY
NAVTRADEVCEN-IH-34 N66-16639

PERIPHERAL AUTONOMIC NERVOUS SYSTEM INDICES VALIDITY STUDY FOR PREDICTING INDIVIDUAL ADJUSTMENT RESPONSE TO ENVIRONMENTAL STRESS
AD-624783 N66-16991

PSYCHOPHYSIOLOGICAL RESPONSES IN HUMANS TO LOW FREQUENCY PRESSURE OSCILLATIONS
NASA-TN-D-3323 N66-18432

PULMONARY CIRCULATION
SITE OF PULMONARY VASOMOTOR ACTIVITY DURING HYPOXIA OR SEROTONIN ADMINISTRATION IN DOGS A66-80554

PULMONARY PRESSURE TRAUMA MECHANISM DURING AIR AND OXYGEN BREATHING N66-17153

EFFECT OF OXYGEN BREATHING IN RESORPTION OF GAS EMBOLISM IN VASCULAR SYSTEM OF CATS AND ON COURSE OF PULMONARY PRESSURE TRAUMA N66-17154

PULMONARY FUNCTION
EXPERIMENTS WITH ANESTHESIZED DOGS SUBJECTED TO G ACCELERATIONS, OBSERVING BEHAVIOR OF ARTERIAL OXYGEN SATURATION AND PULMONARY VENTILATION DURING SHORT PERIODS A66-19083

SYNCOPE INDUCED BY APPLICATION OF NEGATIVE PRESSURE TO LOWER BODY AND EFFECT ON LUNG CARBON MONOXIDE DIFFUSING CAPACITY A66-80565

CHANGES IN VENTILATION AND PULMONARY MECHANICS INDUCED BY HYPERTONIC SODIUM CHLORIDE IN DOGS A66-80587

VENTILATORY RESPONSE TO HYPOXIA AND CARBON DIOXIDE FOLLOWING CARBON DIOXIDE EXPOSURE AND SODIUM BICARBONATE INGESTION IN MAN A66-80588

MECHANICAL AND CHEMICAL VENTILATORY STIMULUS INTERACTION AT LOW AND HIGH ALTITUDES IN MAN. A66-80589

OXYGEN PRESSURE VENTILATION RESPONSE CURVE WITH NORMAL HYDROGEN ION CONCENTRATION AND CARBON DIOXIDE PRESSURE IN DOGS A66-80592

CHANGES IN ESOPHAGEAL PRESSURE TRANSMISSION DURING DETERMINATION OF LUNG COMPLIANCE IN DOGS A66-80593

PULMONARY DIFFUSION AND CAPILLARY BLOOD VOLUME IN DOGS AT REST AND WITH EXERCISE A66-80600

PULMONARY DIFFUSING CAPACITY AND CARDIOVASCULAR RESPONSE IN MAN AS AFFECTED BY APPREHENSION A66-80602

DIURNAL VARIATION IN PULMONARY DIFFUSING CAPACITY OF MAN FOR CARBON MONOXIDE A66-80603

VENTILATION, OXYGEN CONSUMPTION, CARDIAC OUTPUT, AND HEART RATE OF ATHLETIC AND NONATHLETIC SUBJECTS EXERCISING AT THREE LEVELS BEFORE AND AFTER TRAINING A66-80607

HEART RATE, VENTILATORY VOLUME, OXYGEN CONSUMPTION AND ENERGY EXPENDITURE OF MEN BEFORE, DURING, AND AFTER CLIMBING A66-80687

RELATIONSHIP OF PULMONARY VENTILATION AND CARBON DIOXIDE TENSION TO SLEEP AND WAKEFULNESS LEVELS RECORDED BY ELECTROENCEPHALOGRAM IN HUMANS A66-80707

PATHOLOGICAL CHARACTERISTICS AND MECHANISM OF PULMONARY INVOLVEMENT IN HIGH PRESSURE OXYGEN TOXICITY IN GUINEA PIGS AND DOGS N66-17141

TREATMENT OF PULMONARY PRESSURE TRAUMA BY REMOVAL OF EXCESS GAS FROM INTERPLEURAL CAVITIES N66-17155

RECOMPRESSION TREATMENT OF INTRAPULMONARY PRESSURE TRAUMA N66-17160

Q

QUALITY CONTROL
DAY-TO-DAY OPERATIONAL QUALITY CONTROL PROGRAM USED IN THE TRAINING OF ARMY HELICOPTER PILOTS N66-16544

R

RABBIT
ELECTROMETRIC SURFACE PH OF ISCHEMIC KIDNEY AND EFFECT OF HYPOTHERMIA IN DOGS AND RABBITS A66-80629

EFFECT OF LOW ENVIRONMENTAL TEMPERATURE ON CELLULAR BLOOD ELEMENTS AND WEIGHT GAIN IN RABBITS A66-80639

ROLE OF SYMPATHETIC NERVOUS SYSTEM IN CIRCULATORY RESPONSE TO ARTERIAL HYPOXIA IN RABBITS A66-80643

NEUROHUMORAL SLEEP TRANSMISSION IN RABBIT A66-80690

COURSE OF P-WAVE IN RELATION TO BODY POSITION IN RABBIT - PRESSORECEPTOR EFFECT A66-80714

RADIATION ABSORPTION
EVALUATION OF INTERNAL RADIATION DOSES - EFFECTIVE ENERGY OF ABSORBED RADIONUCLIDES AS FUNCTION OF HUMAN AGE
CEA-R-2809 N66-16222

RADIATION DOSE
HIGH ENERGY ELECTRON PHOTOGRAPHIC ISODOSE MEASUREMENTS IN INHOMOGENEOUS MEDIA
CONF-640918-2 N66-17546

RADIATION DOSIMETRY OF PERSONNEL AT NUCLEAR FACILITIES
AE-211 N66-18133

RADIATION EFFECT
IONIZING RADIATION EFFECTS IN MICE PROTECTED WITH HYPOXIA OR WITH CHEMICALS A66-19086

PERSEVERATION LEARNING SET FORMATION TO NON-REWARDED CUES BY NORMAL AND PREVIOUSLY IRRADIATED MONKEYS A66-80585

COMBINED EFFECT OF ACCELERATION AND RADIATION ON PHYSIOLOGICAL FUNCTION IN MICE A66-80740

EFFECTS OF VIBRATION, ACCELERATION AND IRRADIATION ON CHROMOSOMES IN MICE A66-80741

MONOCHROMATIC RED, WHITE, GREEN, AND BLUE SOLAR LIGHT RADIATION EFFECT ON PLANT GROWTH, DEVELOPMENT, AND YIELD N66-16275

HOMOGRAFT RESPONSE AND HEMAGGLUTININ PRODUCTION BY SENSITIZED THYMECTOMIZED IRRADIATED ADULT MICE
USNRDL-TR-920 N66-17065

RADIATION CHIMERA MORTALITY RATE IN RELATION TO NUMBER OF TRANSPLANTED BONE MARROW AND LYMPH NODE CELLS
MBL/1965/23 N66-17484

IONIZING RADIATION EFFECT ON SUBMICROSCOPIC STRUCTURES OF IRRADIATED FROGS AND RESULTING ALTERATIONS IN METABOLIC FUNCTIONS
COO-1080-1 N66-17943

GAMMA RADIATION EFFECTS ON CHIMAERAS OF FRUIT TREES
EUR-2546.F N66-18070

EFFECT OF TRITIATED THYMIDINE AND GAMMA RADIATION ON MORTALITY OF DROSOPHILA MELANOGASTER LARVAE
CNAEM-16 N66-18103

RADIATION EXPOSURE
RADIATION EXPOSURE OF ASTRONAUTS DURING LUNAR MISSIONS A66-80683

BIOLOGICAL RADIATION EXPOSURE STUDIES - LARGE PARTICLE INHALATION IN DOGS, INTRAGASTRIC AND SKIN EXPOSURE IN PIGS, INGESTED PARTICLES IN RATS, AND PLUTONIUM 28 INGESTION RATS
NASA-CR-70520 N66-18157

RADIATION HAZARD
COSMIC RADIATION HAZARDS AND EFFECT ON MAN AND ANIMALS IN RELATION TO SOLAR ACTIVITY AND FLIGHT DURATION A66-80519

BIOLOGICAL HAZARDS OF RADIATIONS IN SPACE AND CHEMICAL PROTECTION AND METHODS OF TREATMENT A66-80520

RADIATION MEASUREMENT
MILK RADIOACTIVITY DETERMINATION AFTER ATOMIC ATTACK BY GEIGER- MUELLER COUNTING TUBE
MBL/1965/22 N66-17483

RADIATION PROTECTION
SHIELDING OF ASTRONAUTS FROM ELECTRONS AND BREMSSTRAHLUNG IN EARTH RADIATION BELTS A66-80739

RADIATION SICKNESS
ROLE OF PITUITARY AND ADRENAL GLANDS IN GENESIS OF AND RECOVERY FROM RADIATION PATHOLOGICAL SYMPTOMS
JPRS-34120 N66-17623

RADIOACTIVE FALLOUT
EQUIPMENT AND PROCEDURE DESCRIPTION FOR AIR SAMPLING BETA RADIATION FALLOUT MEASUREMENTS
RB-65-1 N66-16997

RADIOGRAPHY
THEORETICAL ASPECTS OF RADIOGRAPHIC DENSITOMETRY USED TO DETERMINE MINERAL CONTENT IN BONE N66-17667

QUANTITATIVE RADIOGRAPHY OF BONE MASS AND DENSITY MEASURED BY X-RAYS N66-17668

RADIOGRAPHIC BONE DENSITOMETRY FOR BONE MASS DETERMINATIONS IN OS CALCIS, MIDDLE PHALANX OF FIFTH DIGIT, AND PATELLA N66-17670

FACTORS AFFECTING RADIOGRAPHIC DENSITOMETRY OF LUMBAR SPINE AND FEMORAL NECK N66-17671

COMPARISON OF CORTICAL THICKNESS AND RADIOGRAPHIC MICRODENSITOMETER MEASUREMENTS IN DETERMINING BONE LOSS N66-17672

RADIOPATHOLOGY
EVALUATION OF INTERNAL RADIATION DOSES - EFFECTIVE ENERGY OF ABSORBED RADIONUCLIDES AS FUNCTION OF HUMAN AGE
CEA-R-2809 N66-16222

RANDOM VIBRATION
WHOLE-BODY HUMAN RESPONSE TO RANDOM AND SINUSOIDAL

VIBRATION AT VARIOUS MODES N66-16535

RARE EARTH
PERCUTANEOUS TOXICITY IN ANIMALS AND RELATED INDUSTRIAL HAZARDS IN RARE EARTH PROCESSING
TID-22294 N66-17950

RAREFIED GAS
HIGHER NERVOUS ACTIVITY CHANGES IN STIMULUS RESPONSE FOR DOGS UNDER RAREFIED AIR AND ANOXIC CONDITIONS N66-17148

RAT
SLEEP DEPRIVATION AND MICROSLEEP RESPONSES IN RAT A66-80522

ROLE OF MITOCHONDRIA OF LYMPHOCYTES IN RESPONSE TO IONIZING RADIATION IN WHITE RATS A66-80523

RENAL CHANGES ASSOCIATED WITH ACCLIMATIZATION TO HIGH ALTITUDE IN RATS A66-80553

ENDOCRINE SYSTEM OF MALE AND FEMALE RATS AS AFFECTED BY VIBRATIONAL STRESS A66-80566

DIURNAL VARIATION IN COLLAGEN RIBONUCLEIC ACID, DEOXYRIBONUCLEIC ACID, LACTATE, AND CALCIUM METABOLIC ACTIVITY OF RAT BONE TISSUE A66-80574

AVOIDANCE LEARNING, BLOOD GLUCOSE LEVEL, BODY WEIGHT, AND PROTEIN BOUND IODINE OF RAT EXPOSED TO COLD STRESS AND HABENULAR LESION A66-80614

INCREASED SENSITIVITY OF COLD ADAPTED RAT TO NORADRENALINE AS RELATED TO RESERPINE A66-80615

HEAT, FOOD INTAKE, AND AGING EFFECTS ON THYROID FUNCTION OF MALE RATS A66-80619

THERAPEUTIC USES OF OXYGEN AT HIGH PRESSURE AND PREVENTION OF ITS TOXICITY IN RATS A66-80644

RESISTANCE OF MYOCARDIUM TO ANOXIA IN RATS ACCLIMATIZED TO HIGH ALTITUDE SIMULATION A66-80649

EFFECT OF DURATION OF ANOXIA, FREQUENCY OF STIMULATION, AND TEMPERATURE ON CONTRACTIBILITY OF MYOCARDIUM DAMAGED BY ANOXIA IN RATS A66-80650

EFFECT OF STARVATION AND PROLONGED EXERCISE ON FATTY ACID COMPOSITION IN ADIPOSE TISSUE AND EFFECT OF ADRENALIN ON COMPOSITION OF FATTY ACIDS RELEASED BY ADIPOSE TISSUE IN VITRO IN RATS A66-80651

EFFECT OF ADRENALECTOMY ON ADAPTATION TO HYPOXIA IN RATS - CHANGES IN HAEMOGLOBIN CONCENTRATION AND OSMOTIC RESISTANCE OF ERYTHROCYTES IN PERIPHERAL BLOOD A66-80652

EFFECT OF INFANTILE FEEDING RATE ON BODY WEIGHT LOSS, NITROGEN EXCRETION, AND SURVIVAL TIME DURING SUBSEQUENT EXPOSURE TO STARVATION, IN RATS A66-80653

PHOSPHORYLATION OF FRUCTOSE IN RAT SKELETAL MUSCLES AND LIVER TISSUES DURING HYPOXIA AT SIMULATED ALTITUDE A66-80656

COVERT PATHOGENESIS OF NITROGEN DIOXIDE INDUCED EMPHYSEMA IN RATS A66-80669

URINARY BLADDER CALCULI FORMED AT HIGH ALTITUDE IN RATS A66-80670

INDICATOR OF RAT*S RETINAL RECEPTOR RESPONSE - HISTOLOGICAL STAINING REACTION A66-80679

EFFECT OF STARVATION ON FATTY ACID COMPOSITION OF MYOCARDIUM IN RATS A66-80684

SHIFTS OF CEREBRAL CORTICAL STEADY POTENTIAL DURING SLEEP A66-80698

INTERACTION OF DIETARY PROTEIN AND CALCIUM ON GROWTH AND MAINTENANCE OF BONES OF YOUNG, ADULT, AND AGED RATS A66-80711

EXPERIMENTS WITH ANTIHYPEROXIC PHARMACOPROTECTION IN RATS A66-80715

OXYGEN TENSION CHANGES IN BRAIN TISSUE OF RATS SUBJECTED TO TRANSVERSE ACCELERATION A66-80743

VESTIBULAR SENSITIVITY AND ASSOCIATED LOCOMOTOR RESPONSES OF RATS IN ROTATING ENVIRONMENT
NASA-CR-70394 N66-17271

RELATIONS BETWEEN LACTATE PRODUCTION, RESPIRATION, AND NUCLEAR DAMAGE IN IRRADIATED RAT THYMOCYTES
EUR-2623.E N66-18146

BIOLOGICAL RADIATION EXPOSURE STUDIES - LARGE PARTICLE INHALATION IN DOGS, INTRAGASTRIC AND SKIN EXPOSURE IN PIGS, INGESTED PARTICLES IN RATS, AND PLUTONIUM 28 INGESTION RATS
NASA-CR-70520 N66-18157

REACTION TIME
EFFECTS OF CHANGING LOCATION OF VISUAL STIMULI ON SIMPLE REACTION TIMES OF ADULTS WITH NORMAL VISION N66-16539

RECEPTOR
INTERACTION OF LINEAR AND ANGULAR ACCELERATIONS ON VESTIBULAR RECEPTORS IN MAN A66-80564

RECONNAISSANCE
HELICOPTER RECONNAISSANCE TACTICS FOR AIR CAVALRY UNITS DURING WINTER ENVIRONMENT N66-16531

RECONNAISSANCE AIRCRAFT
TREE-TOP ALTITUDE NAVIGATION FOR RECONNAISSANCE MISSION - ROLE OF AIRCRAFT TYPE, MISSION LENGTH, ILLUMINATION, WEATHER, AND CREW EXPERIENCE N66-16532

REDUCTION
SOLID ELECTROLYTE CARBON DIOXIDE REDUCTION SYSTEM FOR SUBORBITAL FLIGHT
AMRL-TR-65-153 N66-16643

REFERENCE SYSTEM
RIGHTS AND ERRORS KEYS AS REFERENCE SYSTEM FOR IMAGE INTERPRETATION BY HUMAN OPERATORS N66-16528

REFLEX
ROLE OF REFLEXES FROM SINOCAROTID ZONE IN RESPIRATION CONTROL DURING EXCESSIVE INTRAPULMONARY OXYGEN TENSION IN CATS A66-80655

SOMATIC AFFERENT VOLLEYS AND INHIBITORY CONTROL OF SPINAL REFLEXES DURING SLEEP IN CATS A66-80702

BEHAVIOR REFLEX REGULATION OF DECORTICATE CAT, NEURAL MECHANISMS RESPONSIBLE FOR DEEP SLEEP, AND REFLEXES IN CIRCULATION REGULATION DURING SLEEP
AFOSR-65-1579 N66-16469

REGENERATION
REGENERATIVE PROCESSES AND ORGANIC CHANGES IN ANIMALS FOLLOWING SHOCK WAVES
DVL-481 N66-18131

REGENERATIVE CYCLE
REGENERATIVE WASTE DISPOSAL SYSTEM SUPPLYING PHYSIOLOGICAL REQUIREMENTS FOR HUMANS IN SPACE CRAFT
PB-168787 N66-17429

REGRESSION ANALYSIS
REGRESSION CURVES COMPUTED FROM URINARY CALCIUM EXCRETION AND BONE MASS DATA OBTAINED FROM MEN IN BED REST AND AMBULATORY STUDIES N66-17684

REGULATION
PRINCIPLES AND RELATIONSHIPS TO REGULATIVE PROCESSES IN HUMANS - OXYGEN DEFICIENCY TESTS
NASA-TT-F-9737 N66-16574

REMOTE CONTROL
REMOTE MANIPULATION TASK PERFORMANCE AS AFFECTED BY TRANSMISSION DELAY A66-80513

FUNCTIONAL EXTENSION OF HUMAN HANDS THROUGH REMOTE CONTROL MACHINE
NASA-CR-69856 N66-16394

RENAL FUNCTION
STUDY OF KIDNEY FUNCTION IN PERSONNEL OF SPACECRAFT **VOSKHOD** AFTER SPACE MISSION A66-80746

RENAL BLOOD FLOW AND EXTRACELLULAR VOLUME, RENAL AND CARDIAC EFFECTS ON SODIUM EXCRETION, AND ABNORMAL CIRCULATORY STATE EFFECTS ON CARDIAC RATE AND BLOOD PRESSURE - DOG & HUMAN PHYSIOLOGY
NASA-CR-70316 N66-17072

REPLACEMENT
COMPARISON OF TIME REQUIRED TO REMOVE AND REPLACE SPACECRAFT RADIOS UNDER SIMULATED WEIGHTLESSNESS ON DRY LAND AND UNDERWATER N66-17391

REPRODUCTION
EFFECTS OF ADAPTATION OF MICE TO COLD ON REPRODUCTION AND GROWTH A66-80521

CIRCADIAN RHYTHM AND PHOTOPERIODIC REGULATION OF ANNUAL REPRODUCTIVE CYCLE IN BIRDS A66-80544

RESERPINE
INCREASED SENSITIVITY OF COLD ADAPTED RAT TO NORADRENALINE AS RELATED TO RESERPINE A66-80615

RESOLUTION
MEASUREMENT OF MUSCLE TREMOR FREQUENCY DISTRIBUTION ASSOCIATED WITH HAND-HELD FIELD GLASSES AND RESOLUTION EFFECTS A66-80576

RESPIRATION
DYNAMIC RESPONSE CHARACTERISTICS OF CHEMOREFLEX ROLE IN VENTILATORY DEPRESSION IN MAN ON ABRUPT ADMINISTRATION OF OXYGEN A66-80594

SCALENE AND STERNOMASTOID MUSCLE FUNCTION AND RESPIRATION IN HUMANS A66-80597

EFFECT OF DECAMETHONIUM ON HEAD LIFT, HAND GRIP, AND RESPIRATORY MUSCLE POWER IN MAN A66-80598

TRANSDUCER FOR RECORDING INSTANTANEOUS RESPIRATORY WAVEFORMS IN ANIMALS AND MAN A66-80624

ROLE OF REFLEXES FROM SINOCAROTID ZONE IN RESPIRATION CONTROL DURING EXCESSIVE INTRAPULMONARY OXYGEN TENSION IN CATS A66-80655

ROLE OF HIGHER NERVOUS SYSTEM IN MECHANISM OF INTERACTION OF RESPIRATORY AND VASOMOTOR CENTERS DURING DEVELOPMENT OF HEMIC HYPOXIA AND FUNCTIONAL RESTORATION A66-80658

HEART RATE, VENTILATORY VOLUME, OXYGEN COMSUMPTION AND ENERGY EXPENDITURE OF MEN BEFORE, DURING, AND AFTER CLIMBING A66-80687

RESPIRATORY ASPECTS OF WALKING UNDER SUBGRAVITY CONDITIONS WITH VARIOUS GROUND FRICTION A66-80726

INCREASED CARBON DIOXIDE CONTENT EFFECT ON ANIMAL BREATHING IN GAS PRESSURE CHAMBER N66-17151

RELATIONS BETWEEN LACTATE PRODUCTION, RESPIRATION, AND NUCLEAR DAMAGE IN IRRADIATED RAT THYMOCYTES
EUR-2623.E N66-18146

RESPIRATORY DISEASE
ALTERNOBARIC VERTIGO AMONG SWEDISH PILOTS AS RELATED TO COLDS AND ABILITY TO EQUALIZE MIDDLE EAR PRESSURE A66-80569

COVERT PATHOGENESIS OF NITROGEN DIOXIDE INDUCED EMPHYSEMA IN RATS A66-80669

TREATMENT OF SEVERE SPINAL FORM OF DECOMPRESSION SICKNESS N66-17161

RESPIRATORY IMPEDANCE
ELECTRICAL ACTIVITY OF PHRENIC NERVE FROM RESPIRATORY CENTER OF DOG DURING OBSTRUCTED BREATHING A66-80601

RESPIRATORY RATE
ROLE OF VAGUS NERVES IN CIRCULATORY AND RESPIRATORY REACTIONS DURING INCREASED INTRAPULMONARY PRESSURE N66-17158

RESPIRATORY REFLEX
ROLE OF PROPRIOCEPTIVE IMPULSES DURING RESPIRATION WITH INCREASED INTRAPULMONARY PRESSURE IN REGULATING RESPIRATION AND CIRCULATION N66-17156

EFFECT OF GAS EXPANSION IN GASTROINTESTINAL TRACT DURING BAROMETRIC PRESSURE CHANGES ON RESPIRATORY AND CARDIOVASCULAR REFLEXES N66-17159

RESPIRATORY SYSTEM
AGE DEPENDENCE OF RESISTANCE OF CHICKENS TO 100 PERCENT OXYGEN AT ONE ATM / OAP/, NOTING DELAYED MORTALITY IN ADULT BIRDS A66-17458

RELATIONSHIP OF AIR FLOW TO ESOPHAGEAL PRESSURE DURING MAXIMAL RESPIRATORY EFFORT IN MAN A66-80596

DIGITAL COMPUTER SIMULATION OF RESPIRATORY RESPONSE TO CEREBROSPINAL FLUID CARBON DIOXIDE TENSION OF CAT A66-80648

FROG RESPIRATORY SYSTEM CILIARY MUCOUS TRANSPORT DECREMENT IN CLOSED CONTROLLED SUBMARINE CABIN ATMOSPHERE - ANIMAL STUDY
REPT.-443 N66-16990

CIRCULATORY AND RESPIRATORY REACTIONS IN DOGS TO DECOMPRESSION AND ARTIFICIAL AIR EMBOLISM N66-17138

RESPIRATORY AND CIRCULATORY CHANGES IN DOGS DURING HIGH PRESSURE OXYGEN TOXICITY N66-17140

PRESSURE CHAMBER EXPERIMENTS FOR STUDYING CHANGES IN MOTOR, CADIOVASCULAR, RESPIRATORY, AND CENTRAL NERVOUS SYSTEMS DURING OXYGEN TOXICITY N66-17145

TREATMENT OF PULMONARY PRESSURE TRAUMA BY REMOVAL OF EXCESS GAS FROM INTERPLEURAL CAVITIES N66-17155

RECOMPRESSION TREATMENT OF INTRAPULMONARY PRESSURE TRAUMA N66-17160

REST
PULMONARY DIFFUSION AND CAPILLARY BLOOD VOLUME IN DOGS AT REST AND WITH EXERCISE A66-80600

BLOOD, PLASMA, AND RED CELL VOLUMES OF YOUNG AND OLD MEN DURING REST AND EXERCISE IN DESERT ENVIRONMENT AND AT HIGH ALTITUDE A66-80606

CARDIAC OUTPUT IN MAN AT REST AND AT WORK DURING AND AFTER ACCLIMATIZATION TO 3,800 METERS A66-80608

CONCENTRATION AND DILUTION OF URINE IN PERMANENT INHABITANTS AT REST AND EXERCISE IN HOT ENVIRONMENT AS RELATED TO FLUID INTAKE A66-80685

CHANGES IN WORKING CAPACITY OF MUSCLE AFTER EXPOSURE OF MAN TO HYPOKINETIC CONDITIONS AND

IMPORTANCE TO MANNED SPACE FLIGHT
A66-80737

RETINA
TEMPORAL FACTORS IN PATTERN VISION
A66-80551

EXCITATION OF PERIPHERAL RETINA WITH COINCIDENT AND DISPARATE TEST FIELDS A66-80575

CHANGES IN PATTERNS OF HUMAN ELECTROENCEPHALOGRAM DURING FLUCTUATIONS OF PERCEPTION OF STABILIZED RETINAL IMAGE A66-80579

EFFECT OF HYPERBARIA AND HYBAROXIA ON CALIBER OF RETINAL AND CEREBRAL VESSELS IN MAN
A66-80581

EFFECT OF PURE OXYGEN BREATHING ON IMMATURE RETINAL VESSELS IN MAN AND EXPERIMENTAL ANIMALS
A66-80642

GLAREMITS MEASUREMENT BY CONE THRESHOLDS AND BY BLEACHING OF CONE PIGMENTS A66-80677

INDICATOR OF RAT*S RETINAL RECEPTOR RESPONSE - HISTOLOGICAL STAINING REACTION
A66-80679

RETINAL DETACHMENT IN PILOT INCURRED IN FLIGHT - CASE HISTORY A66-80728

RHYTHM
ACCURACY OF GEOPHYSICAL RHYTHMS AND FREQUENCY ANALYSIS A66-80524

RELATIONSHIP BETWEEN PLANT PHOTOPERIODICITY AND CIRCADIAN RHYTHM A66-80541

RIBONUCLEIC ACID
DIURNAL VARIATION IN COLLAGEN RIBONUCLEIC ACID, DEOXYRIBONUCLEIC ACID, LACTATE, AND CALCIUM METABOLIC ACTIVITY OF RAT BONE TISSUE
A66-80574

PREPARATION, PROPERTIES, AND STORAGE STABILITY OF MACROMOLECULES LABELLED BY TRITIUM AND BY BIOLOGICAL SYNTHESIS - NUCLEIC ACIDS, LYSOZYME, AND RIBONUCLEASE
EUR-2419.F N66-16439

RODENT
PERSISTENCE OF CIRCADIAN RHYTHM IN HIBERNATING RODENTS A66-80540

ROTARY WING AIRCRAFT
TECHNIQUE FOR PERFORMING MISSION ANALYSIS ON FIXED AND ROTARY WING AIRCRAFT N66-16538

PREDICTING PILOT SUCCESS IN FIXED AND ROTARY WING AVIATION TRAINING BY USE OF TEST BATTERIES
N66-16543

ROTATING ENVIRONMENT
VESTIBULAR SENSITIVITY AND ASSOCIATED LOCOMOTOR RESPONSES OF RATS IN ROTATING ENVIRONMENT
NASA-CR-70394 N66-17271

S

SAFETY DEVICE
SHOULDER SLOPE ANGLE OF FLYING PERSONNEL FOR IMPROVED SHOULDER HARNESS
AM-65-14 N66-17297

SAFETY FACTOR
OXYGEN SYSTEM FOR CREW OF EXECUTIVE JET AIRCRAFT, USING CONTINUOUS FLOW OF OXYGEN, FIXED CAPACITY RESERVIOR, AND PROVIDING SAFETY PRESSURE
FPRC/MEMO-207 N66-18054

SAMPLING
EFFECT OF SAMPLING TECHNIQUE ON DETERMINATION OF ARTERIAL OXYGEN PRESSURE DURING OXYGEN BREATHING IN MAN A66-80595

SAMPLING DEVICE
CASCADE VAULT SAMPLER FOR BACTERIAL AEROSOLS
A66-19087

SATELLITE OBSERVATION
ZERO-GRAVITY EFFECT ON OPOSSUM FETUS OBSERVED BY TV SYSTEM IN PROPOSED SATELLITE
A66-18726

SATELLITE RENDEZVOUS
UNAIDED VISUAL DETECTION OF TARGET SATELLITE FOR RENDEZVOUS PURPOSES, DISCUSSING INTENSITY AND ANGULAR VELOCITY IN STAR FIELD A66-18815

SATURATION
ELECTRIC ANALOGY OF TISSUE GAS SATURATION UNDER SIMULATED DECOMPRESSION CONDITIONS
N66-17139

SCANNING
FIELD CRITERION TEST TO ASSESS SCANNING AND TARGET IDENTIFICATION SKILLS OF COMBAT ARMS OFFICERS
N66-16530

SCANNING DEVICE
BONE MINERAL MEASUREMENTS BY PHOTON ABSORPTION WITH IMPROVED SCANNING DEVICE N66-17674

SCHIZOPHRENIA
EYE MOVEMENTS OF WAKING NORMAL SUBJECTS AND SCHIZOPHRENICS WITH CLOSED EYES
A66-80661

SCINTILLATION COUNTER
NEUTRON ACTIVATION AND SCINTILLATION COUNTERS FOR DETECTION OF SODIUM AND POTASSIUM IN BIOLOGICAL MEDIA
CEA-R-2837 N66-17491

SCREENING TECHNIQUE
VESTIBULAR DISORIENTATION TEST VALIDITY IN SCREENING PILOT TRAINEES
NASA-CR-70306 N66-17079

SEASONAL VARIATION
ECOLOGICAL AND SEASONAL VARIATIONS OF SKIN TEMPERATURE IN MAN A66-80736

SECRETION
RELATIVE EFFECT OF HYPOXIA AND HYPERCAPNIA ON ADRENAL MEDULLARY SECRETION IN ANESTHETIZED DOGS
A66-80640

SELF-EXCITATION
SELF REGULATION AND MEMORY LOCATION IN HUMAN BRAIN
JPRS-33898 N66-16258

SEMICIRCULAR CANAL
DETERMINATION OF THRESHOLD EXCITABILITY OF SEMICIRCULAR CANALS WITH THERMAL STIMULATION METHOD IN PIGEONS A66-80738

EFFECTS OF STREPTOMYCIN SULFATE IN TREATMENT OF ENDOLYMPHATIC HYDROPS - MENIERES DISEASE
NASA-CR-69862 N66-16446

SENSITIVITY
INCREASED SENSITIVITY OF COLD ADAPTED RAT TO NORADRENALINE AS RELATED TO RESERPINE
A66-80615

SENSORY DISCRIMINATION
MAGNITUDE ESTIMATION OF LOUDNESS, COMPARING EXPERIMENTAL RESULTS OF OBSERVERS ESTIMATES TO SONE SCALE A66-17732

SENSORY PERCEPTION
ELECTRIC SPARK STIMULATION OF SKIN FOR STUDY OF SINGLE SENSORY UNITS
AD-624848 N66-17120

SEQUENTIAL ANALYSIS
LOGIC DIAGRAMS OF PILOT ACTION IN EMERGENCY SITUATION
JPRS-34200 N66-17638

SEROTONIN
SITE OF PULMONARY VASOMOTOR ACTIVITY DURING HYPOXIA OR SEROTONIN ADMINISTRATION IN DOGS
A66-80554

SERVOCONTROL
COMPUTER PROGRAM TO SIMULATE SECOND ORDER SERVO SYSTEM DYNAMICS UNDER AUTOMATIC AND MANUAL CONTROL
NASA-CR-70340 N66-17082

SEX FACTOR
ENDOCRINE SYSTEM OF MALE AND FEMALE RATS AS AFFECTED BY VIBRATIONAL STRESS A66-80566

MINERAL CONTENT OF BONE CORTEX RELATED TO THICKNESS IN SECOND METACARPAL AS A FUNCTION OF AGE AND SEX N66-17673

SHOCK WAVE
REGENERATIVE PROCESSES AND ORGANIC CHANGES IN ANIMALS FOLLOWING SHOCK WAVES
DVL-481 N66-18131

SHOULDER
SHOULDER SLOPE ANGLE OF FLYING PERSONNEL FOR IMPROVED SHOULDER HARNESS
AM-65-14 N66-17297

SIGNAL DETECTION
DETECTION IN HOMOGENEOUS VISUAL FIELD UNDER CONDITIONS OF INFINITE DEPTH OF FOCUS A66-80667

SILICONE RUBBER
PERMEABILITY MEASUREMENTS FOR DIFFUSION OF CARBON DIOXIDE AND GLUCOSE THROUGH SILICON RUBBER AND TEFLON IN STUDY OF ENZYMATIC BREAKDOWN PRODUCTS SEPARATION
NASA-CR-70190 N66-16968

SIMULATOR TRAINING
SIMULATED MANNED FLIGHT IN SPACE TRAINING CAPSULE
JPRS-33934 N66-17620

SIZE PERCEPTION
SIZE CONSTANCY EFFECT DURING UNDERWATER IMMERSION A66-80552

SKIN /BIOL/
PHYSIOLOGICAL AND CLINICAL APPLICATIONS OF TRANSCUTANEOUS DOPPLER FLOWMETER APPLYING TRANSDUCER TO SKIN SURFACE OVER STRATEGIC SITES TO INDICATE BLOOD FLOW VELOCITY A66-80604

CUTANEOUS VASCULAR AND SWEATING RESPONSES TO TYMPANIC AND SKIN TEMPERATURES IN NUDE SUBJECTS A66-80609

OPERATIONAL CAPABILITY AND PHYSIOLOGICAL AND CLINICAL APPLICATIONS OF TRANSCUTANEOUS ULTRASONIC BLOOD VELOCITY METER A66-80620

FUNCTIONAL ORGANIZATION OF HAIRY SKIN IN RESPONSE TO SENSORY STIMULI A66-80662

ELECTRIC SPARK STIMULATION OF SKIN FOR STUDY OF SINGLE SENSORY UNITS
AD-624848 N66-17120

SKIN RESISTANCE
FEASIBILITY OF MULTIPLE BIO-ELECTRODE ARRAYS TO SENSOR GALVANIC SKIN RESPONSE SIGNALS DURING BODY MOVEMENT
NASA-CR-70532 N66-18068

SKIN TEMPERATURE /BIOL/
ECOLOGICAL AND SEASONAL VARIATIONS OF SKIN TEMPERATURE IN MAN A66-80736

SLEEP
NOCTURNAL BODY TEMPERATURE, SWEATING RATE, AND DEPTH OF SLEEP MONITORED BY ELECTRONCEPHALOGRAPHY A66-80610

MORPHOLOGY AND FUNCTION OF SLEEP PHYSIOLOGY A66-80688

BIOCHEMISTRY DURING SLEEP AND WAKEFULNESS - REVIEW OF EXPERIMENTS IN BRAIN METABOLISM A66-80689

NEUROHUMORAL SLEEP TRANSMISSION IN RABBIT A66-80690

EFFECT OF ACETYLCHOLINE, ESERINE, ATROPINE, AND CARBACHOL ON SLEEP INDUCTION PATH IN BRAIN IN CATS A66-80692

HYPOTHALAMIC CONTROL OF SLEEP MECHANISM IN CATS A66-80696

NEURONAL ACTIVITY IN VISUAL AND MOTOR CORTEX DURING SLEEP AND WAKING IN MAMMALS A66-80697

SHIFTS OF CEREBRAL CORTICAL STEADY POTENTIAL DURING SLEEP A66-80698

CIRCULATION OF CEREBRAL CORTEX AND ARTERIAL BLOOD PRESSURE CORRELATION WITH ELECTROENCEPHALOGRAM OF RAPID EYE MOVEMENT STATE A66-80699

CORRELATION OF ELECTROENCEPHALOGRAM WITH PUPIL AND EYELID BEHAVIOR, VISUAL ACCOMMODATION, AND OCULAR MOVEMENTS DURING SLEEP A66-80701

SOMATIC AFFERENT VOLLEYS AND INHIBITORY CONTROL OF SPINAL REFLEXES DURING SLEEP IN CATS A66-80702

STUDY OF MECHANISMS OF DUALITY OF SLEEP A66-80703

CEREBRAL CORTEX AND SUBCORTEX RELATIONSHIPS IN CHIMPANZEE DURING SLEEP, WAKEFULNESS, AND RAPID EYE MOVEMENT STATE A66-80704

THALAMIC TRANSMISSION DURING SLEEP AND WAKEFULNESS IN CATS A66-80705

CORTICAL ACTIVITY DURING SLEEP AND WAKEFULNESS IN CATS A66-80706

RELATIONSHIP OF PULMONARY VENTILATION AND CARBON DIOXIDE TENSION TO SLEEP AND WAKEFULNESS LEVELS RECORDED BY ELECTROENCEPHALOGRAM IN HUMANS A66-80707

BEHAVIOR REFLEX REGULATION OF DECORTICATE CAT, NEURAL MECHANISMS RESPONSIBLE FOR DEEP SLEEP, AND REFLEXES IN CIRCULATION REGULATION DURING SLEEP
AFOSR-65-1579 N66-16469

SLEEP DEPRIVATION
SLEEP DEPRIVATION AND MICROSLEEP RESPONSES IN RAT A66-80522

SLOW NEUTRON
SLOW NEUTRON CALIBRATION OF FILM AND GAMMA DOSIMETERS
AERE-R-4960 N66-18214

SOCIAL ISOLATION
INTERPERSONAL EXCHANGE IN ISOLATION A66-80641

SODIUM
RENAL BLOOD FLOW AND EXTRACELLULAR VOLUME, RENAL AND CARDIAC EFFECTS ON SODIUM EXCRETION, AND ABNORMAL CIRCULATORY STATE EFFECTS ON CARDIAC RATE AND BLOOD PRESSURE - DOG & HUMAN PHYSIOLOGY
NASA-CR-70316 N66-17072

NEUTRON ACTIVATION AND SCINTILLATION COUNTERS FOR DETECTION OF SODIUM AND POTASSIUM IN BIOLOGICAL MEDIA
CEA-R-2837 N66-17491

SODIUM BICARBONATE
VENTILATORY RESPONSE TO HYPOXIA AND CARBON DIOXIDE FOLLOWING CARBON DIOXIDE EXPOSURE AND SODIUM BICARBONATE INGESTION IN MAN A66-80588

SODIUM CHLORIDE
CHANGES IN VENTILATION AND PULMONARY MECHANICS INDUCED BY HYPERTONIC SODIUM CHLORIDE IN DOGS A66-80587

SOIL
QUALITATIVE AND QUANTITATIVE TEST FOR ENZYME ACTIVITIES IN TERRESTRIAL SOIL ADAPTED TO MARS PROBE TELEMETRY PROCEDURES
NASA-CR-70058 N66-18163

SOLAR RADIATION
COSMIC RADIATION HAZARDS AND EFFECT ON MAN AND ANIMALS IN RELATION TO SOLAR ACTIVITY AND FLIGHT DURATION A66-80519

SOUND INTENSITY
MAGNITUDE ESTIMATION OF LOUDNESS, COMPARING EXPERIMENTAL RESULTS OF OBSERVERS ESTIMATES TO SONE SCALE A66-17732

SOUND TRANSMISSION
PITCH DISCRIMINATION AT HIGH FREQUENCIES BY AIR AND BONE CONDUCTION A66-80663

SPACE CABIN ATMOSPHERE
RATS EXPOSED TO SPACE CABIN ATMOSPHERE FOR TWO WEEKS, NOTING MORTALITY RATE, ORGANISM FUNCTIONING, GROWTH RATE, ETC A66-17663

SPACE CABIN SIMULATION
SIMULATED MANNED FLIGHT IN SPACE TRAINING CAPSULE JPRS-33934 N66-17620

SPACE ENVIRONMENT
N ASA BIOSATELLITE STUDY OF ORGANISM IN SPACE ENVIRONMENT, WITH EMPHASIS ON WEIGHTLESSNESS AND RADIATION EFFECT A66-17615

BIOSATELLITE FOR TV MONITORING OF DEVELOPMENT OF OPOSSUM EMBRYONIC FETUS IN SPACE ENVIRONMENT A66-18583

OUTPUT CHARACTERISTICS, PERFORMANCE DECREMENT FROM WEARING PRESSURIZED SUITS, AND LIFE SUPPORT REQUIREMENTS IN SPACE ENVIRONMENT N66-17393

PHYSIOLOGICAL ENERGY EXPENDITURE FROM DONNING FULL PRESSURE SUIT UNDER SPACE AND TIME LIMITATIONS N66-17394

SPACE FLIGHT
RESEARCH IN EXOBIOLOGY, ENVIRONMENTAL BIOLOGY, BEHAVIORAL BIOLOGY, MOLECULAR BIOLOGY AND BIOINSTRUMENTATION, SPACE FLIGHT PROGRAMS, AND MANNED SPACE FLIGHT
NASA-SP-92 N66-17778

SPACE FLIGHT FEEDING
ALGAE GROWTH EXPERIMENTS AND APPLICATIONS - SPACE FLIGHT NUTRITION, FOOD, AND AGRICULTURE
JPRS-34012 N66-16499

SPACE MISSION
LIFE SUPPORT CLOSED CYCLES FOR MISSIONS TO OUTER SPACE LASTING 12 MONTHS OR LONGER, CONSIDERING RECOVERY AND REPLENISHING OF WATER, FOOD AND OXYGEN FROM WASTES A66-17229

SPACE RADIATION
BIOLOGICAL HAZARDS OF RADIATIONS IN SPACE AND CHEMICAL PROTECTION AND METHODS OF TREATMENT A66-80520

SPACE SCIENCE
SOVIET ABSTRACTS ON PROBLEMS OF SPACE BIOLOGY N66-16933

RESEARCH IN EXOBIOLOGY, ENVIRONMENTAL BIOLOGY, BEHAVIORAL BIOLOGY, MOLECULAR BIOLOGY AND BIOINSTRUMENTATION, SPACE FLIGHT PROGRAMS, AND MANNED SPACE FLIGHT
NASA-SP-92 N66-17778

SPACE SIMULATION
VISUAL SIMULATION FOR AIRCRAFT AND SPACE FLIGHT TRAINERS A66-80511

SPACE SUIT
METABOLIC RATES IN PRESSURIZED PRESSURE SUIT, AFFECTING HEAT BALANCE OF SUBJECTS METABOLIC HEAT WITH HEAT REMOVED BY ENVIRONMENTAL CONTROL A66-17657

EXTRAVEHICULAR MOBILITY UNIT / EMU/ TO BE WORN BY ASTRONAUTS ON APOLLO LUNAR LANDING MISSION A66-18584

PASSIVE TEMPERATURE CONTROL FOR EXTRAVEHICULAR SPACE SUITS
AMRL-TR-65-156 N66-16743

SPACE SUIT DEVELOPMENT STATUS
NASA-TN-D-3291 N66-16942

PRESSURIZED SPACE SUITS TO SIMULATE WEIGHTLESSNESS AT ZERO GRAVITY - EFFECT OF CLOTHING CONSTRAINTS ON HUMAN PERFORMANCE
REL-HFG-65-1 N66-17386

PRESSURIZED SPACE SUIT EFFECTS ON HUMAN PERFORMANCE IN FRICTIONLESS ENVIRONMENT N66-17392

ENERGY EXPENDITURE, METABOLIC HEAT PRODUCTION AND OXYGEN CONSUMPTION, AND WORK CAPACITY OF MEN CLOTHED IN SPACE SUITS N66-17395

SPACE SYSTEMS ENGINEERING
SYSTEM COSTS AND PHARMACOLOGICAL TECHNIQUES AS FUNCTION OF EXERCISE PROGRAM DESIGNED TO MAINTAIN SPACE CREW PHYSICAL FITNESS A66-17658

SPACE VEHICLE
POTENTIAL SOURCES AND METHODS DESCRIPTION FOR SPACE VEHICLE WATER RECOVERY INCLUDING MISSION WEIGHT PENALTIES
NASA-TM-X-56123 N66-17221

MAINTENANCE OF SPACE VEHICLES DURING SHORT PERIODS OF SIMULATED WEIGHTLESSNESS BY WORKERS WEARING PRESSURIZED SUITS N66-17389

SPACECRAFT COMPONENT
COMPARISON OF TIME REQUIRED TO REMOVE AND REPLACE SPACECRAFT RADIOS UNDER SIMULATED WEIGHTLESSNESS ON DRY LAND AND UNDERWATER N66-17391

SPACECRAFT DESIGN
HUMAN ENGINEERING AND PERFORMANCE CONSIDERATIONS IN SPACECRAFT DESIGN AND SPACE FLIGHT MISSIONS N66-16429

SPACECRAFT ENVIRONMENT
OXYGEN RECOVERY FROM METABOLIC CARBON DIOXIDE FOR SPACECRAFT ENVIRONMENT A66-18821

SPACECRAFT STERILIZATION
TEXT ON PREVENTION OF CONTAMINATION OF OTHER CELESTIAL BODIES BY TERRESTRIAL ORGANISMS VIA SPACE VEHICLES A66-19238

DRY HEAT EFFECTIVENESS IN MICROORGANISM STERILIZATION AT 105 DEG C FOR SPACE PROBE APPLICATIONS
NASA-CR-70321 N66-17088

SPACECREW
ASTRONAUT SELECTION AND CREW PREPARATION PROCEDURES FOR GEMINI AND APOLLO PROGRAMS A66-18578

TRAINING AND SELECTION PROCEDURES USED AT USAF AEROSPACE RESEARCH PILOT SCHOOL A66-18579

SPATIAL ORIENTATION
CLOCK MECHANISMS IN CELESTIAL ORIENTATION OF ANIMALS A66-80549

SIZE CONSTANCY EFFECT DURING UNDERWATER IMMERSION A66-80552

VALIDITY OF BRIEF VESTIBULAR DISORIENTATION TEST IN SCREENING PILOT TRAINEES A66-80559

AIRCRAFT ACCIDENTS AND DISORIENTATION EXPERIENCES OF ARMY HELICOPTER PILOTS AS RELATED TO TRAINING AND INSTRUMENT DESIGN A66-80563

PROGRAMMED INSTRUCTION TO LEARN BASIC OBSERVER SKILLS OF VISUAL SEARCH, TARGET RECOGNITION, GEOGRAPHIC ORIENTATION, AND TARGET LOCATION N66-16545

REVISION IN CINEMA METHOD IMPROVES GEOGRAPHIC ORIENTATION IN AIRCRAFT PILOTS DURING SIMULATED LOW ALTITUDE FLIGHT

TR-751-5 N66-17587

SPECTRAL ANALYSIS
HUMAN ELECTROENCEPHALOGRAM GENERATOR SPECTRAL ANALYSIS IN POSTERIOR CEREBRAL REGIONS
NASA-CR-57050 N66-18389

SPEECH DISCRIMINATION
GENERAL MODEL OF SPEECH DISCRIMINATION USED TO REFORMULATE MOTOR THEORY OF PERCEPTION
JPRS-34106 N66-16954

SPIN
TOLERANCE TO SPINNING IN EJECTION ESCAPE
A66-80561

SPINAL CORD
SOMATIC AFFERENT VOLLEYS AND INHIBITORY CONTROL OF SPINAL REFLEXES DURING SLEEP IN CATS
A66-80702

TREATMENT OF SEVERE SPINAL FORM OF DECOMPRESSION SICKNESS N66-17161

SPORE
RESISTANCE EVALUATION OF NATURAL SOURCE SPORE ISOLATES TO INACTIVATION BY THERMAL SHOCK
NASA-CR-70029 N66-16712

STAINLESS STEEL
MICROORGANIC CONTAMINATION OF STAINLESS STEEL DUE TO HANDLING BY PERSONNEL
NASA-TM-X-55408 N66-17240

STAPHYLOCOCCUS
PHYSICAL AND CHEMICAL PROPERTIES BY SEDIMENTATION AND SPECTRAL ANALYSIS FOR PURIFIED STAPHYLOCOCCAL ENTEROTOXIN B
AD-444380 N66-17644

STAR FIELD
UNAIDED VISUAL DETECTION OF TARGET SATELLITE FOR RENDEZVOUS PURPOSES, DISCUSSING INTENSITY AND ANGULAR VELOCITY IN STAR FIELD A66-18815

STARVATION
AMELIORATIVE VALUE OF CARBOHYDRATE AND ELECTROLYTES TO SURVIVAL OF FASTING HUMAN SUBJECTS IN ARCTIC A66-80613

EFFECT OF PROLONGED COLD AND STARVATION, AND SUBSEQUENT REFEEDING ON PLASMA LIPIDS AND GLUCOSE IN NORMAL MAN A66-80630

DEFECT OF URINARY ACIDIFICATION DURING FASTING IN MAN A66-80631

EFFECT OF STARVATION AND PROLONGED EXERCISE ON FATTY ACID COMPOSITION IN ADIPOSE TISSUE AND EFFECT OF ADRENALIN ON COMPOSITION OF FATTY ACIDS RELEASED BY ADIPOSE TISSUE IN VITRO IN RATS A66-80651

EFFECT OF INFANTILE FEEDING RATE ON BODY WEIGHT LOSS, NITROGEN EXCRETION, AND SURVIVAL TIME DURING SUBSEQUENT EXPOSURE TO STARVATION, IN RATS A66-80653

ABSORPTIVE CAPACITY OF INTESTINE AND STOMACH DURING WATER DEPRIVATION AND STARVATION IN DOGS A66-80657

EFFECT OF STARVATION ON FATTY ACID COMPOSITION OF MYOCARDIUM IN RATS A66-80684

STEROID
REPORTS FROM U.S.S.R. ACADEMY OF MEDICAL SCIENCES ON CORTICOSTEROIDS, STEROID HORMONES, DIABETES, THYROID GLAND AND PANCREAS DISEASES, AUTORADIOGRAPHY, AND ELECTROCARDIOGRAPHY
JPRS-33643 N66-16244

STIMULUS
RELATIONAL DETERMINATION OF BEHAVIOR, AND SIGNIFICANT RELATIONSHIPS BETWEEN RESPONSE VARIABLES AND BEHAVIORALLY EFFECTIVE PROPERTIES OF STIMULI
TR-35 N66-16509

HIGHER NERVOUS ACTIVITY CHANGES IN STIMULUS RESPONSE FOR DOGS UNDER RAREFIED AIR AND ANOXIC CONDITIONS N66-17148

STOCHASTIC PROCESS
STOCHASTIC AUTOMATIC MODELS FOR SYNTHESIS OF LEARNING SYSTEMS
TR-EE65-17 N66-17615

STOL AIRCRAFT
POWERED TRIM CHANGES AFFECTING PILOT DURING SIMULATED LANDING FOR SHORT TAKE OFF AND LANDING AIRCRAFT
NASA-TN-D-3246 N66-16550

STORAGE STABILITY
PREPARATION, PROPERTIES, AND STORAGE STABILITY OF MACROMOLECULES LABELLED BY TRITIUM AND BY BIOLOGICAL SYNTHESIS - NUCLEIC ACIDS, LYSOZYME, AND RIBONUCLEASE
EUR-2419.F N66-16439

STREPTOMYCIN
EFFECTS OF STREPTOMYCIN SULFATE IN TREATMENT OF ENDOLYMPHATIC HYDROPS - MENIERES DISEASE
NASA-CR-69862 N66-16446

STRESS /BIOL/
BIOMEDICAL SURVEY OF AIR TRAFFIC CONTROL FACILITIES - RELATIONSHIP OF EXPERIENCE AND AGING TO INCIDENCE OF STRESS SYMPTOMS
AM-65-6 N66-16669

PERIPHERAL AUTONOMIC NERVOUS SYSTEM INDICES VALIDITY STUDY FOR PREDICTING INDIVIDUAL ADJUSTMENT RESPONSE TO ENVIRONMENTAL STRESS
AD-624783 N66-16991

SUBGRAVITY
RESPIRATORY ASPECTS OF WALKING UNDER SUBGRAVITY CONDITIONS WITH VARIOUS GROUND FRICTION
A66-80726

SUBORBITAL FLIGHT
SOLID ELECTROLYTE CARBON DIOXIDE REDUCTION SYSTEM FOR SUBORBITAL FLIGHT
AMRL-TR-65-153 N66-16643

SUBSTRATE
ENZYME SUBSTRATE - RNA-RIBONUCLEASE AND SUCCINATE-CYTOCHROME C REDUCTASE - REACTIONS IN HIGH MAGNETIC FIELDS A66-80645

SUNLIGHT
MONOCHROMATIC RED, WHITE, GREEN, AND BLUE SOLAR LIGHT RADIATION EFFECT ON PLANT GROWTH, DEVELOPMENT, AND YIELD N66-16275

SUPERSATURATION
PERMISSIBLE SUPERSATURATION COEFFICIENT IN HUMANS BREATHING AIR AND OXYGEN-HELIUM MIXTURE IN PRESSURE CHAMBER N66-17127

SUPERSATURATION COEFFICIENT AND DISSOLVED GAS TENSION RELATION IN GAS-LIQUID INTERACTION AT HIGH PRESSURES N66-17128

SUPERSATURATION OF ANIMALS AND HUMANS WITH GASES FOR DECOMPRESSION SICKNESS STUDIES N66-17129

PERMISSIBLE SUPERSATURATION VALUE AFTER INHALATION OF AIR-HELIUM-OXYGEN MIXTURES AND DECOMPRESSION SICKNESS SYMPTOMS N66-17130

ANIMAL STUDIES ON SUPERSATURATION WITH NITROGEN AND INCREASED BODY RESISTANCE TO DECOMPRESSION SICKNESS N66-17131

SURVIVAL
AMELIORATIVE VALUE OF CARBOHYDRATE AND ELECTROLYTES TO SURVIVAL OF FASTING HUMAN SUBJECTS IN ARCTIC A66-80613

EFFECT OF INFANTILE FEEDING RATE ON BODY WEIGHT LOSS, NITROGEN EXCRETION, AND SURVIVAL TIME DURING SUBSEQUENT EXPOSURE TO STARVATION, IN RATS A66-80653

LIFE SHORTENING IN MICE EXPOSED TO X-RAY IRRADIATION IN RELATION TO AGE AND HYPOXIA
A66-80731

COMBINED EFFECT OF ACCELERATION AND RADIATION ON PHYSIOLOGICAL FUNCTION IN MICE A66-80740

SWEATING
CUTANEOUS VASCULAR AND SWEATING RESPONSES TO TYMPANIC AND SKIN TEMPERATURES IN NUDE SUBJECTS
A66-80609

NOCTURNAL BODY TEMPERATURE, SWEATING RATE, AND DEPTH OF SLEEP MONITORED BY ELECTRONCEPHALOGRAPHY
A66-80610

SYNCHRONIZATION
RESPONSE CURVES IN CIRCADIAN PERIODICITY - SYNCHRONIZATION AND PHASE SHIFT IN ANIMALS AND PLANTS A66-80526

SYNCHRONIZATION AND RANGES OF ENTRAINMENT IN CIRCADIAN RHYTHM A66-80527

DEVIATIONS FROM HUMAN RHYTHMIC METABOLIC FUNCTIONS
A66-80536

UNIFIED THEORY FOR BIOLOGICAL RHYTHMS - ENVIRONMENTAL PERIODICITIES AS TIMERS ON PLANT AND ANIMAL RHYTHMS A66-80537

SYNCOPE
SYNCOPE INDUCED BY APPLICATION OF NEGATIVE PRESSURE TO LOWER BODY AND EFFECT ON LUNG CARBON MONOXIDE DIFFUSING CAPACITY A66-80565

SYSTEM DESIGN
SYSTEM COSTS AND PHARMACOLOGICAL TECHNIQUES AS FUNCTION OF EXERCISE PROGRAM DESIGNED TO MAINTAIN SPACE CREW PHYSICAL FITNESS A66-17658

SYSTEMS ANALYSIS
SYSTEMS ANALYSIS NAVY ANTIAIRCRAFT WARFARE TRAINING PROGRAM
NAVTRADEVCEN-1574-1 N66-16640

COMPUTER USE FOR HANDLING ADVANCED SYSTEMS HUMAN FACTORS TASK DATA
NASA-CR-70513 N66-18161

SYSTEMS DESIGN
AIR TRAFFIC CONTROL INCIDENT REPORTING SYSTEM DESIGN TO MAXIMIZE CORRECTIVE FEEDBACK
AM-65-10 N66-16583

T

TACTICS
HELICOPTER RECONNAISSANCE TACTICS FOR AIR CAVALRY UNITS DURING WINTER ENVIRONMENT
N66-16531

TACTILE DISCRIMINATION
ELECTRIC SPARK STIMULATION OF SKIN FOR STUDY OF SINGLE SENSORY UNITS
AD-624848 N66-17120

TARGET ACQUISITION
VISUAL AID IN DETECTION, RECOGNITION AND ACQUISITION OF TARGETS AT DIFFERENT ALTITUDES AND SPEEDS A66-17285

UNAIDED VISUAL DETECTION OF TARGET SATELLITE FOR RENDEZVOUS PURPOSES, DISCUSSING INTENSITY AND ANGULAR VELOCITY IN STAR FIELD A66-18815

TARGET RECOGNITION
FIELD CRITERION TEST TO ASSESS SCANNING AND TARGET IDENTIFICATION SKILLS OF COMBAT ARMS OFFICERS
N66-16530

PROGRAMMED INSTRUCTION TO LEARN BASIC OBSERVER SKILLS OF VISUAL SEARCH, TARGET RECOGNITION, GEOGRAPHIC ORIENTATION, AND TARGET LOCATION
N66-16545

TASK COMPLEXITY
TASK LOADING EFFECTS ON PILOT PERFORMANCE DURING SIMULATED LOW ALTITUDE, HIGH SPEED, TERRAIN FOLLOWING MISSIONS N66-16540

TEFLON
PERMEABILITY MEASUREMENTS FOR DIFFUSION OF CARBON DIOXIDE AND GLUCOSE THROUGH SILICON RUBBER AND TEFLON IN STUDY OF ENZYMATIC BREAKDOWN PRODUCTS SEPARATION
NASA-CR-70190 N66-16968

TELEMETRY
CONSTRAINT PLATFORM AND BIOTELEMETRY MODULE FOR HUMAN BALLISTOCARDIOGRAM AND ELECTROCARDIOGRAM IN ZERO GRAVITY ENVIRONMENT
NASA-CR-69828 N66-16283

QUALITATIVE AND QUANTITATIVE TEST FOR ENZYME ACTIVITIES IN TERRESTRIAL SOIL ADAPTED TO MARS PROBE TELEMETRY PROCEDURES
NASA-CR-70058 N66-18163

TEMPERATURE CONTROL
PASSIVE TEMPERATURE CONTROL FOR EXTRAVEHICULAR SPACE SUITS
AMRL-TR-65-156 N66-16743

TEMPERATURE EFFECT
EFFECT OF TEMPERATURE VARIATIONS ON BIOLOGICAL CLOCKS IN PLANTS AND ANIMALS A66-80530

TEMPERATURE EFFECTS ON DECOMPRESSION SICKNESS AND AIR EMBOLISM IN ANIMALS N66-17137

TENSION
SUPERSATURATION COEFFICIENT AND DISSOLVED GAS TENSION RELATION IN GAS-LIQUID INTERACTION AT HIGH PRESSURES N66-17128

TERRAIN FOLLOWING AIRCRAFT
TASK LOADING EFFECTS ON PILOT PERFORMANCE DURING SIMULATED LOW ALTITUDE, HIGH SPEED, TERRAIN FOLLOWING MISSIONS N66-16540

TEST METHOD
USEFULNESS AND LIMITATIONS OF NELSON TEST METHOD FOR SYPHILIS IN DETERMINING FLIGHT FITNESS IN PILOTS A66-80720

TESTIS
CIRCADIAN SYSTEMS OF METABOLISM AND TESTICULAR RESPONSE IN PHOTOPERIODIC RESPONSES IN VERTEBRATES A66-80542

CIRCADIAN RHYTHM CONTROL OF VERNAL TESTICULAR RESPONSE IN HOUSE FINCH, CAPRODACUS MEXICANUS
A66-80545

CIRCADIAN RHYTHM OF TESTICULAR RESPONSE AND PHOTOPERIODICITY IN HOUSE SPARROW, PASSER DOMESTICUS A66-80546

THERAPY
BIOLOGICAL HAZARDS OF RADIATIONS IN SPACE AND CHEMICAL PROTECTION AND METHODS OF TREATMENT
A66-80520

SUPPRESSION OF MOTION SICKNESS BY THIETHYLPERAZINE
A66-80570

HUMAN CENTRIFUGE STUDIES OF RELATIVE EFFECTIVENESS OF ANTIMOTION SICKNESS DRUGS, INCLUDING HYOSCINE D-AMPHETAMINE, MECLIZINE, CHLORPROMAZINE, THIETHYLPERAZINE, PROCHLORPERAZINE, AND TRIMETHOBENZAMIDE A66-80573

THERAPEUTIC USES OF OXYGEN AT HIGH PRESSURE AND PREVENTION OF ITS TOXICITY IN RATS
A66-80644

DECOMPRESSION SICKNESS OF DOGS AS AFFECTED BY PLASMA REPLACEMENT BY DEXTRAN AND HYPOTHERMIA
A66-80668

BIOLOGICAL EFFECT OF AIR ELECTRICITY IN STATISTICAL BIOMETEOROLOGY, CLIMATIC CHAMBER EXPERIMENTS, AND THERAPY A66-80709

THERAPEUTIC USE OF ACETYLASPARTIC ACID-CITRULLINE PREPARATION IN FLIGHT FATIGUE DURING SPORT FLYING A66-80721

RECOMPRESSION TREATMENT OF INTRAPULMONARY PRESSURE TRAUMA N66-17160

THERMAL INSULATION
PASSIVE TEMPERATURE CONTROL FOR EXTRAVEHICULAR SPACE SUITS
AMRL-TR-65-156 N66-16743

THERMAL SHOCK
RESISTANCE EVALUATION OF NATURAL SOURCE SPORE ISOLATES TO INACTIVATION BY THERMAL SHOCK
NASA-CR-70029 N66-16712

THERMODYNAMICS
THERMODYNAMIC PRINCIPLES OF ION TRANSFER ACROSS MEMBRANES FOR NUTRIENT AND EXCREMENT FLOW IN BIOLOGICAL SYSTEM - ELECTROPHYSIOLOGY
BNL-9338 N66-17176

THERMOELECTRIC COOLING
DRINKING WATER RECLAMATION FROM URINE BY THERMOELECTRICS, INCLUDING OPERATIONAL THEORY AND DATA FOR WORKING MODELS A66-18730

THERMOREGULATION
THERMOREGULATION IN MICE AND HELIUM-OXYGEN ATMOSPHERE CONDUCTIVITY A66-80681

THYMUS
HOMOGRAFT RESPONSE AND HEMAGGLUTININ PRODUCTION BY SENSITIZED THYMECTOMIZED IRRADIATED ADULT MICE
USNRDL-TR-920 N66-17065

THYROID
AVOIDANCE LEARNING, BLOOD GLUCOSE LEVEL, BODY WEIGHT, AND PROTEIN BOUND IODINE OF RAT EXPOSED TO COLD STRESS AND HABENULAR LESION A66-80614

HEAT, FOOD INTAKE, AND AGING EFFECTS ON THYROID FUNCTION OF MALE RATS A66-80619

REPORTS FROM U.S.S.R. ACADEMY OF MEDICAL SCIENCES ON CORTICOSTEROIDS, STEROID HORMONES, DIABETES, THYROID GLAND AND PANCREAS DISEASES, AUTORADIOGRAPHY, AND ELECTROCARDIOGRAPHY
JPRS-33643 N66-16244

TIME DELAY
REMOTE MANIPULATION TASK PERFORMANCE AS AFFECTED BY TRANSMISSION DELAY A66-80513

TIME FACTOR
COSMIC RADIATION HAZARDS AND EFFECT ON MAN AND ANIMALS IN RELATION TO SOLAR ACTIVITY AND FLIGHT DURATION A66-80519

TEMPORAL SUMMATION OF POSITIVE AND NEGATIVE FLASHES IN VISUAL SYSTEM AND INHIBITION BY DOUBLE POSITIVE OR DOUBLE NEGATIVE FLASHES A66-80577

TIME FOR ACCLIMATIZATION OF HEALTHY YOUNG EXERCISING MEN TO HOT, WET ENVIRONMENT A66-80616

VISUAL RECOVERY IN HUMANS FROM BRIEF EXPOSURES TO HIGH LUMINANCE A66-80674

TISSUE
ELECTRIC ANALOGY OF TISSUE GAS SATURATION UNDER SIMULATED DECOMPRESSION CONDITIONS N66-17139

ULTRASONIC METHODS TO MEASURE BONE MASSES AND OTHER TISSUES IN SITU N66-17679

TITAN II ICBM
TWO YEARS OPERATIONAL EXPERIENCE OF TITAN II ICBM MEDICAL SUPPORT PERSONNEL IN PREVENTING ACCIDENTS FROM OPERATIONAL HAZARDS A66-80567

TOBACCO
PRODUCTION OF TOBACCO PLANT MUTANTS RESISTANT TO BLUE MOLD DISEASE BY SEED TREATMENT WITH IONIZING RADIATION - LITERATURE SURVEY
CNAEM-18 N66-18147

TOCOPHEROL
THERAPEUTIC USES OF OXYGEN AT HIGH PRESSURE AND PREVENTION OF ITS TOXICITY IN RATS A66-80644

TOLERANCE /BIOL/
PHYSIOLOGICAL REACTIONS OF HUMAN BODY TO TRANSVERSE ACCELERATION AND MEANS OF INCREASING RESISTANCE A66-80560

TOLERANCE TO SPINNING IN EJECTION ESCAPE A66-80561

INCREASED TOLERANCE TO AIR EMBOLISM IN ANIMALS BY REPEATED INJECTIONS N66-17135

TOXICITY
ACUTE INHALATION TOXICITY OF OXYGEN DIFLUORIDE IN ALBINO RAT A66-19723

INHALATION TOXICITY AT AMBIENT AND REDUCED PRESSURES IN MONKEYS, DOGS AND RODENTS UPON EXPOSURE TO OZONE, NITROGEN DIOXIDE AND CARBON TETRACHLORIDE A66-19724

TOXICITY INTERACTIONS OF HIGH PRESSURE OXYGEN AND X-RAYS ON DROSOPHILA A66-80732

TOXICITY AND SAFETY HAZARD
HEALTH HAZARDS IN HANDLING AND PROCESSING BERYLLIUM AND ITS COMPOUNDS, NOTING EFFECT ON LUNGS AND REVIEWING AEC RECOMMENDATIONS A66-18854

PERCUTANEOUS TOXICITY IN ANIMALS AND RELATED INDUSTRIAL HAZARDS IN RARE EARTH PROCESSING
TID-22294 N66-17950

TOXICOLOGY
PHYSICAL AND CHEMICAL PROPERTIES BY SEDIMENTATION AND SPECTRAL ANALYSIS FOR PURIFIED STAPHYLOCOCCAL ENTEROTOXIN B
AD-444380 N66-17644

TRACKING STUDY
TRACKING STUDY TO DETERMINE MAXIMUM CONTROL ELEMENT LAG AND MAXIMUM AND MINIMUM CONTROL SENSITIVITY TOLERATED IN MANUALLY CONTROLLED COMPENSATORY TRACKING TASK
NASA-TN-D-3242 N66-16548

TRAINING
VISUAL SIMULATION FOR AIRCRAFT AND SPACE FLIGHT TRAINERS A66-80511

AIRCRAFT ACCIDENTS AND DISORIENTATION EXPERIENCES OF ARMY HELICOPTER PILOTS AS RELATED TO TRAINING AND INSTRUMENT DESIGN A66-80563

HUMAN FACTORS RESEARCH AND DEVELOPMENT DEALING WITH COMMUNICATION AND CONTROL, RECONNAISSANCE, PERFORMANCE DECREMENT IN AIR MOBILITY, AND ARMY AVIATION PERSONNEL AND TRAINING - CONFERENCE
AD-456363 N66-16526

SYSTEMS ANALYSIS NAVY ANTIAIRCRAFT WARFARE TRAINING PROGRAM
NAVTRADEVCEN-1574-1 N66-16640

TRANSDUCER
TRANSDUCER FOR RECORDING INSTANTANEOUS RESPIRATORY WAVEFORMS IN ANIMALS AND MAN A66-80624

TRANSFER FUNCTION
ELECTROCUTANEOUS SIGNALS USED WITH AUDITORY AND VISUAL STIMULI TO PROVIDE ALERTING AND WARNING SIGNS FOR RECEPTION OF MILITARY INFORMATION N66-16529

TRANSMISSION
REMOTE MANIPULATION TASK PERFORMANCE AS AFFECTED BY TRANSMISSION DELAY A66-80513

THALAMIC TRANSMISSION DURING SLEEP AND WAKEFULNESS IN CATS A66-80705

TRANSPORT AIRCRAFT
FLIGHT CREW OXYGEN EQUIPMENT DEVELOPED FOR VC 10 TRANSPORT AIRCRAFT

FPRC/MEMO-208 N66-18055

TRAUMA
EFFECT OF OXYGEN BREATHING IN RESORPTION OF GAS EMBOLISM IN VASCULAR SYSTEM OF CATS AND ON COURSE OF PULMONARY PRESSURE TRAUMA N66-17154

TREE
GAMMA RADIATION EFFECTS ON CHIMAERAS OF FRUIT TREES
EUR-2546.F N66-18070

TRITIUM
PREPARATION, PROPERTIES, AND STORAGE STABILITY OF MACROMOLECULES LABELLED BY TRITIUM AND BY BIOLOGICAL SYNTHESIS - NUCLEIC ACIDS, LYSOZYME, AND RIBONUCLEASE
EUR-2419.F N66-16439

U

U.S.S.R.
SOVIET HIGH ALTITUDE PRESSURE-SUIT DEVELOPMENT, TESTING AND USE, 1934-1955 A66-17666

PHYSIOLOGICAL RESPONSES IN HUMANS AND ANIMALS TO AIR EMBOLISMS AND PRESSURE ENVIRONMENTS IN DECOMPRESSION SICKNESS STUDIES
NASA-TT-F-358 N66-17126

U.S.S.R. SPACE PROGRAM
SOVIET ABSTRACTS ON PROBLEMS OF SPACE BIOLOGY N66-16933

ULTRASONIC RADIATION
PITCH DISCRIMINATION AT HIGH FREQUENCIES BY AIR AND BONE CONDUCTION A66-80663

ULTRASONICS
ULTRASONIC METHODS TO MEASURE BONE MASSES AND OTHER TISSUES IN SITU N66-17679

ULTRAVIOLET RADIATION
VIBRATING MIRROR FLYING SPOT ULTRAVIOLET MICROSCOPE WITH INCORPORATED TELEVISION SYSTEM - ULTRAVIOLET RADIATION EFFECTS ON CELL STRUCTURE AND BEHAVIOR
TID-21611 N66-17985

UNDERWATER TEST
COMPARISON OF TIME REQUIRED TO REMOVE AND REPLACE SPACECRAFT RADIOS UNDER SIMULATED WEIGHTLESSNESS ON DRY LAND AND UNDERWATER N66-17391

URINE
CONCENTRATION AND DILUTION OF URINE IN PERMANENT INHABITANTS AT REST AND EXERCISE IN HOT ENVIRONMENT AS RELATED TO FLUID INTAKE A66-80685

V

VASCULAR SYSTEM
CUTANEOUS VASCULAR AND SWEATING RESPONSES TO TYMPANIC AND SKIN TEMPERATURES IN NUDE SUBJECTS A66-80609

EFFECT OF PURE OXYGEN BREATHING ON IMMATURE RETINAL VESSELS IN MAN AND EXPERIMENTAL ANIMALS A66-80642

EFFECT OF OXYGEN BREATHING IN RESORPTION OF GAS EMBOLISM IN VASCULAR SYSTEM OF CATS AND ON COURSE OF PULMONARY PRESSURE TRAUMA N66-17154

CHANGES IN CAROTID SINUS PRESSOR AND DEPRESSOR REFLEXES DURING RESPIRATION UNDER INCREASED INTRAPULMONARY PRESSURE N66-17157

TREATMENT OF SEVERE SPINAL FORM OF DECOMPRESSION SICKNESS N66-17161

VASOCONSTRICTION
EFFECT OF HYPERBARIA AND HYBAROXIA ON CALIBER OF RETINAL AND CEREBRAL VESSELS IN MAN A66-80581

EFFECT OF BLOOD HYDROGEN ION CONCENTRATION ON HYPOXIC PULMONARY VASOCONSTRICTION IN DOGS A66-80586

VERTEBRAL COLUMN
VERTEBRAL COLUMN INJURY DURING AIRCRAFT ACCIDENTS - CASE HISTORY A66-80722

DETERMINING THICKNESS AND MINERAL CONTENT IN VERTEBRA AND OTHER BONES BY X-RAY AND OTHER DENSITOMETRY - APPLICATION OF TECHNIQUES TO HUMAN STUDIES
NASA-SP-64 N66-17666

CORTICAL BONE VOLUME AND LUMBAR SPINE DENSITY RELATED TO AGING IN WOMEN - X-RAY MEASUREMENTS OF RELATIVE VERTEBRAL DENSITY N66-17669

FACTORS AFFECTING RADIOGRAPHIC DENSITOMETRY OF LUMBAR SPINE AND FEMORAL NECK N66-17671

ASH CONCENTRATION, FEMORAL THICKNESS, AND VERTEBRAL MINERALIZATION RELATED TO AGING IN HUMANS N66-17680

MEASUREMENTS OF BONE VOLUME AND VERTEBRAL DENSITY N66-17681

VERTIGO
ALTERNOBARIC VERTIGO AMONG SWEDISH PILOTS AS RELATED TO COLDS AND ABILITY TO EQUALIZE MIDDLE EAR PRESSURE A66-80569

VESTIBULAR APPARATUS
VALIDITY OF BRIEF VESTIBULAR DISORIENTATION TEST IN SCREENING PILOT TRAINEES A66-80559

INTERACTION OF LINEAR AND ANGULAR ACCELERATIONS ON VESTIBULAR RECEPTORS IN MAN A66-80564

INTERACTIONS BETWEEN OPTOKINETIC AND VESTIBULO-OCULAR RESPONSES DURING HEAD ROTATION IN VARIOUS PLANES A66-80568

SUPPRESSION OF MOTION SICKNESS BY THIETHYLPERAZINE A66-80570

IMPORTANCE IN PILOT TRAINING AND EVALUATION OF INDUCED NYSTAGMUS IN SUBJECTS WITH SPONTANEOUS NYSTAGMUS - DIFFERENTIATION OF TYPES OF NYSTAGMUS WITH ELECTRONYSTAGMOGRAPHY A66-80716

EVALUATION OF HEARING LOSS AND VESTIBULAR DAMAGE IN PILOTS AND AIR FORCE PERSONNEL A66-80717

EFFECTS OF STREPTOMYCIN SULFATE IN TREATMENT OF ENDOLYMPHATIC HYDROPS - MENIERES DISEASE
NASA-CR-69862 N66-16446

VESTIBULAR EFFECT
VESTIBULAR SENSITIVITY AND ASSOCIATED LOCOMOTOR RESPONSES OF RATS IN ROTATING ENVIRONMENT
NASA-CR-70394 N66-17271

VESTIBULAR TEST
DETERMINATION OF THRESHOLD EXCITABILITY OF SEMICIRCULAR CANALS WITH THERMAL STIMULATION METHOD IN PIGEONS A66-80738

VALIDITY OF BRIEF VESTIBULAR DISORIENTATION TEST IN SCREENING PILOT TRAINEES
NASA-CR-70146 N66-16603

VESTIBULAR DISORIENTATION TEST VALIDITY IN SCREENING PILOT TRAINEES
NASA-CR-70306 N66-17079

VIBRATION EFFECT
WHOLE-BODY HUMAN RESPONSE TO RANDOM AND SINUSOIDAL VIBRATION AT VARIOUS MODES N66-16535

VIBRATION PERCEPTION
BASIC PRINCIPLES OF STIMULATED ELECTROAUDITORY PERCEPTION N66-16819

VIBRATIONAL STRESS
ENDOCRINE SYSTEM OF MALE AND FEMALE RATS AS AFFECTED BY VIBRATIONAL STRESS A66-80566

MECHANICAL AND CHEMICAL VENTILATORY STIMULUS INTERACTION AT LOW AND HIGH ALTITUDES IN MAN. A66-80589

NATURE OF VIBRATION HYPERVENTILATION IN MAN. A66-80590

EFFECTS OF VIBRATION, ACCELERATION AND IRRADIATION ON CHROMOSOMES IN MICE A66-80741

EFFECT OF HIGH-FREQUENCY VIBRATIONS ON ABSORPTION OF RADIOACTIVE PHOSPHORUS IN INTESTINE, IN DOGS A66-80744

VIGILANCE
VIGILANCE PERFORMANCE OF MEN WITH DIFFERENT TYPES OF CENTRAL NERVOUS SYSTEM A66-80734

VISIBILITY
EFFECTS OF HIGH LUMINANCE SOURCES UPON VISIBILITY OF POINT SOURCES
NASA-TM-X-56561 N66-18332

VISION
SIZE CONSTANCY EFFECT DURING UNDERWATER IMMERSION A66-80552

ONE-STAGE MODEL FOR VISUAL TEMPORAL INTEGRATION A66-80676

CORRELATION OF ELECTROENCEPHALOGRAM WITH PUPIL AND EYELID BEHAVIOR, VISUAL ACCOMMODATION, AND OCULAR MOVEMENTS DURING SLEEP A66-80701

PREFLIGHT, IN-FLIGHT, AND POSTFLIGHT TESTS OF VISUAL ACUITY AND CAPABILITY OF GEMINI V CREW MEMBERS N66-18011

VISUAL ACUITY
VISUAL RECOVERY IN HUMANS FROM BRIEF EXPOSURES TO HIGH LUMINANCE A66-80674

INFRARED IMAGE-CONVERTER METHOD OF OBSERVING EYE MOTION IN FLASH BLINDNESS EXPERIMENTS. A66-80675

PREFLIGHT, IN-FLIGHT, AND POSTFLIGHT TESTS OF VISUAL ACUITY AND CAPABILITY OF GEMINI V CREW MEMBERS N66-18011

VISUAL AID
VISUAL AID IN DETECTION, RECOGNITION AND ACQUISITION OF TARGETS AT DIFFERENT ALTITUDES AND SPEEDS A66-17285

VISUAL CONTROL
INFLUENCE OF EYE LID MOVEMENT UPON ELECTRO-OCULOGRAPHIC RECORDING OF VERTICAL SACCADIC EYE MOVEMENTS A66-17662

VISUAL CUE
EFFECT OF PROLONGED WEIGHTLESSNESS ON OTOLITH FUNCTION AND HORIZONTALITY MEASUREMENTS IN ABSENCE OF GRAVITY AND VISUAL CUES N66-18015

VISUAL DISPLAY
VISUAL SIMULATION FOR AIRCRAFT AND SPACE FLIGHT TRAINERS A66-80511

EFFECTS OF CONSPICUITY CODING ON TIME REQUIRED AND ERRORS MADE IN LOCATING UPDATED INFORMATION ON INDIVIDUAL AND GROUP COMMAND SYSTEM DISPLAYS N66-16527

VISUAL FIELD
EXCITATION OF PERIPHERAL RETINA WITH COINCIDENT AND DISPARATE TEST FIELDS A66-80575

DETECTION IN HOMOGENEOUS VISUAL FIELD UNDER CONDITIONS OF INFINITE DEPTH OF FOCUS A66-80667

LITERATURE REVIEW OF HUMAN REACTIONS TO STRUCTURELESS VISUAL FIELD EXPOSURE
TR-34 N66-16508

TOXIC EFFECT OF HIGH PARTIAL OXYGEN PRESSURE NOTED IN CONSTRICTION OF PERIPHERAL VISUAL FIELD N66-17162

VISUAL FLIGHT
MARINE PILOT TRAINING TO DEVELOP VISUAL HABIT PATTERNS AS AID IN REDUCING MID-AIR COLLISION HAZARDS A66-17712

VISUAL OBSERVATION
PROGRAMMED INSTRUCTION TO LEARN BASIC OBSERVER SKILLS OF VISUAL SEARCH, TARGET RECOGNITION, GEOGRAPHIC ORIENTATION, AND TARGET LOCATION N66-16545

VISUAL PERCEPTION
TEMPORAL FACTORS IN PATTERN VISION A66-80551

VISUALLY EVOKED CORTICAL RESPONSE CORRELATES OF PERCEPTUAL MASKING AND ENHANCEMENT A66-80578

CHANGES IN PATTERNS OF HUMAN ELECTROENCEPHALOGRAM DURING FLUCTUATIONS OF PERCEPTION OF STABILIZED RETINAL IMAGE A66-80579

VISUAL PERCEPTION DURING POST-ROTATORY NYSTAGMUS IN PILOTS A66-80718

VISUAL STIMULUS
EFFECTS OF CHANGING LOCATION OF VISUAL STIMULI ON SIMPLE REACTION TIMES OF ADULTS WITH NORMAL VISION N66-16539

VISUAL SYSTEM
INTERACTIONS BETWEEN OPTOKINETIC AND VESTIBULO-OCULAR RESPONSES DURING HEAD ROTATION IN VARIOUS PLANES A66-80568

TEMPORAL SUMMATION OF POSITIVE AND NEGATIVE FLASHES IN VISUAL SYSTEM AND INHIBITION BY DOUBLE POSITIVE OR DOUBLE NEGATIVE FLASHES A66-80577

AVERAGED ELECTRICAL RESPONSES TO DIFFUSE AND TO PATTERNED LIGHT IN HUMAN A66-80671

FUNDAMENTAL RESPONSE CURVES OF NORMAL AND DEUTERANOMALOUS OBSERVER DERIVED FROM CHROMATIC ADAPTATION DATA A66-80680

VITAMIN
VITAMIN CONTENT, NUTRITIONAL VALUE, AND AMINO ACID COMPOSITION OF EGG WHITE AFTER LONG TERM STORAGE AT ROOM TEMPERATURE
R-2089 N66-18072

VOSKHOD I SPACECRAFT
USE OF METHODS OF CORRELATION ANALYSIS FOR STUDY OF TELEMETRIC DATA OF CARDIOVASCULAR SYSTEM RESPONSES DURING FLIGHT OF VOSKHOD I SPACECRAFT A66-80745

STUDY OF KIDNEY FUNCTION IN PERSONNEL OF SPACECRAFT **VOSKHOD** AFTER SPACE MISSION A66-80746

VTOL AIRCRAFT
CONTROL ANALOG VERTICAL ATTITUDE INDICATOR AND VTOL FLIGHT DISPLAY FOR HELICOPTER PILOT TRAINING N66-16536

W

WAKEFULNESS
POSTHYPERVENTILATION APNEA IN AWAKE MAN A66-80591

EYE MOVEMENTS OF WAKING NORMAL SUBJECTS AND SCHIZOPHRENICS WITH CLOSED EYES A66-80661

BIOCHEMISTRY DURING SLEEP AND WAKEFULNESS - REVIEW OF EXPERIMENTS IN BRAIN METABOLISM A66-80689

NEURONAL ACTIVITY IN VISUAL AND MOTOR CORTEX DURING SLEEP AND WAKING IN MAMMALS A66-80697

CEREBRAL CORTEX AND SUBCORTEX RELATIONSHIPS IN CHIMPANZEE DURING SLEEP, WAKEFULNESS, AND RAPID EYE MOVEMENT STATE A66-80704

THALAMIC TRANSMISSION DURING SLEEP AND WAKEFULNESS IN CATS A66-80705

CORTICAL ACTIVITY DURING SLEEP AND WAKEFULNESS IN CATS A66-80706

RELATIONSHIP OF PULMONARY VENTILATION AND CARBON DIOXIDE TENSION TO SLEEP AND WAKEFULNESS LEVELS RECORDED BY ELECTROENCEPHALOGRAM IN HUMANS A66-80707

WARNING SIGNAL
ELECTROCUTANEOUS SIGNALS USED WITH AUDITORY AND VISUAL STIMULI TO PROVIDE ALERTING AND WARNING SIGNS FOR RECEPTION OF MILITARY INFORMATION N66-16529

WASTE DISPOSAL
REGENERATIVE WASTE DISPOSAL SYSTEM SUPPLYING PHYSIOLOGICAL REQUIREMENTS FOR HUMANS IN SPACE CRAFT
PB-168787 N66-17429

WASTE UTILIZATION
LIFE SUPPORT CLOSED CYCLES FOR MISSIONS TO OUTER SPACE LASTING 12 MONTHS OR LONGER, CONSIDERING RECOVERY AND REPLENISHING OF WATER, FOOD AND OXYGEN FROM WASTES A66-17229

WATER INTAKE
ABSORPTIVE CAPACITY OF INTESTINE AND STOMACH DURING WATER DEPRIVATION AND STARVATION IN DOGS A66-80657

CONCENTRATION AND DILUTION OF URINE IN PERMANENT INHABITANTS AT REST AND EXERCISE IN HOT ENVIRONMENT AS RELATED TO FLUID INTAKE A66-80685

REVIEW OF STUDIES INVESTIGATING POSSIBLIITY THAT MAN IN HOT CLIMATE MAY ADAPT TO WATER DEPRIVATION A66-80686

WATER RECOVERY
LIFE SUPPORT CLOSED CYCLES FOR MISSIONS TO OUTER SPACE LASTING 12 MONTHS OR LONGER, CONSIDERING RECOVERY AND REPLENISHING OF WATER, FOOD AND OXYGEN FROM WASTES A66-17229

DRINKING WATER RECLAMATION FROM URINE BY THERMOELECTRICS, INCLUDING OPERATIONAL THEORY AND DATA FOR WORKING MODELS A66-18730

POTENTIAL SOURCES AND METHODS DESCRIPTION FOR SPACE VEHICLE WATER RECOVERY INCLUDING MISSION WEIGHT PENALTIES
NASA-TM-X-56123 N66-17221

WEIGHT FACTOR
POTENTIAL SOURCES AND METHODS DESCRIPTION FOR SPACE VEHICLE WATER RECOVERY INCLUDING MISSION WEIGHT PENALTIES
NASA-TM-X-56123 N66-17221

WEIGHTLESSNESS
ZERO-GRAVITY EFFECT ON OPOSSUM FETUS OBSERVED BY TV SYSTEM IN PROPOSED SATELLITE A66-18726

DEHYDRATION AND WEIGHTLESSNESS IN MANNED SPACE FLIGHT N66-16428

EFFECT OF WEIGHTLESSNESS AND IMMOBILIZATION ON BONE DEMINERALIZATION OF PRIMARY AND BACKUP GEMINI V CREW USING RADIOGRAPHIC BONE DENSITOMETRY N66-18014

EFFECT OF PROLONGED WEIGHTLESSNESS ON OTOLITH FUNCTION AND HORIZONTALITY MEASUREMENTS IN ABSENCE OF GRAVITY AND VISUAL CUES N66-18015

WEIGHTLESSNESS EFFECTS ON CIRCULATORY SYSTEM AND MUSCULAR ACTIVITY OF ANIMALS AND HUMANS DURING SPACE FLIGHTS
JPRS-34064 N66-18028

WEIGHTLESSNESS SIMULATION
BONE CALCIUM LEVELS DURING TWO WEEKS OF SIMULATED WEIGHTLESSNESS IN HUMAN SUBJECTS A66-80562

PRESSURIZED SPACE SUITS TO SIMULATE WEIGHTLESSNESS AT ZERO GRAVITY - EFFECT OF CLOTHING CONSTRAINTS ON HUMAN PERFORMANCE
REL-HFG-65-1 N66-17386

MAINTENANCE OF SPACE VEHICLES DURING SHORT PERIODS OF SIMULATED WEIGHTLESSNESS BY WORKERS WEARING PRESSURIZED SUITS N66-17389

COMPARISON OF TIME REQUIRED TO REMOVE AND REPLACE SPACECRAFT RADIOS UNDER SIMULATED WEIGHTLESSNESS ON DRY LAND AND UNDERWATER N66-17391

WORK CAPACITY
ENERGY EXPENDITURE, METABOLIC HEAT PRODUCTION AND OXYGEN CONSUMPTION, AND WORK CAPACITY OF MEN CLOTHED IN SPACE SUITS N66-17395

X

X-RAY ABSORPTION
EFFECT OF WEIGHTLESSNESS AND IMMOBILIZATION ON BONE DEMINERALIZATION OF PRIMARY AND BACKUP GEMINI V CREW USING RADIOGRAPHIC BONE DENSITOMETRY N66-18014

X-RAY DENSITY MEASUREMENT
DETERMINING THICKNESS AND MINERAL CONTENT IN VERTEBRA AND OTHER BONES BY X-RAY AND OTHER DENSITOMETRY - APPLICATION OF TECHNIQUES TO HUMAN STUDIES
NASA-SP-64 N66-17666

QUANTITATIVE RADIOGRAPHY OF BONE MASS AND DENSITY MEASURED BY X-RAYS N66-17668

SOFT X-RAY-RADIATION FOR BONE DENSITOMETRY USING GAMMA RADIOISOTOPE SOURCE IN PRECISION X-RAY TUBE N66-17676

X-RAY EQUIPMENT
COMPARISON OF CORTICAL THICKNESS AND RADIOGRAPHIC MICRODENSITOMETER MEASUREMENTS IN DETERMINING BONE LOSS N66-17672

X-RAY IRRADIATION
HEMATOPOIETIC CHANGES IN DIFFERENT ANIMALS AFTER X-IRRADIATION AS COMPARED WITH ANALOGOUS CHANGES IN MAN A66-80724

LIFE SHORTENING IN MICE EXPOSED TO X-RAY IRRADIATION IN RELATION TO AGE AND HYPOXIA A66-80731

TOXICITY INTERACTIONS OF HIGH PRESSURE OXYGEN AND X-RAYS ON DROSOPHILA A66-80732

PHYSIOLOGICAL RESPONSE OF GERM CELLS IN FLOWER BEETLES, TRIBOLIUM CASTANEUM, TO X-RAY IRRADIATION
HW-SA-3747 N66-17833

X-RAY AND GAMMA RAY EFFECTS ON DEOXYRIBONUCLEIC ACID /DNA/
EUR-2471.F N66-17938

X-RAY SPECTROMETRY
U SAF WHOLE BODY GAMMA SPECTROMETRY IN SUPPORT OF AIR FORCE AEROSPACE MISSION A66-17664

Y

YEAST
ANOMERIC SPECIFICITY OF YEAST GALACTOKINASE BY CHROMATOGRAPHIC METHODS
NASA-TM-X-56057 N66-17218

Z

ZERO GRAVITY
CONSTRAINT PLATFORM AND BIOTELEMETRY MODULE FOR HUMAN BALLISTOCARDIOGRAM AND ELECTROCARDIOGRAM

IN ZERO GRAVITY ENVIRONMENT
NASA-CR-69828 N66-16283

HUMAN PERFORMANCE IN PRESSURIZED SUITS UNDER ZERO GRAVITY CONDITIONS N66-17388

Corporate Source Index

Listing of Reports by Source

A Notation of Content, rather than the title of the document, appears under each corporate source. The accession number is located beneath and to the right of the Notation of Content, e.g., N66-12345. Under any one corporate source, the accession numbers are arranged in sequence.

A

ABERDEEN PROVING GROUND, MD.
CYCLIC GRIP FOR HELICOPTER CONTROL - HUMAN ENGINEERING DESIGN STUDY N66-16537

TECHNIQUE FOR PERFORMING MISSION ANALYSIS ON FIXED AND ROTARY WING AIRCRAFT N66-16538

AEROSPACE MEDICAL DIV. AEROSPACE MEDICAL RESEARCH LABS. /6570TH/, WRIGHT-PATTERSON AFB, OHIO.
HUMAN PERFORMANCE IN PRESSURIZED SUITS UNDER ZERO GRAVITY CONDITIONS N66-17388

COMPUTER USE FOR HANDLING ADVANCED SYSTEMS HUMAN FACTORS TASK DATA
NASA-CR-70513 N66-18161

AIR FORCE INST. OF TECH., WRIGHT-PATTERSON AFB, OHIO.
PROPOSED CEREBRAL CORTEX DUPLICATION OF FOURIER OPTICAL TRANSFORM PROCESS AND SPACIAL FILTERING - MATHEMATICAL MODEL
GE/EE/65-18 N66-16986

AKTIEBOLAGET ATOMENERGI, STOCKHOLM /SWEDEN/.
RADIATION DOSIMETRY OF PERSONNEL AT NUCLEAR FACILITIES
AE-211 N66-18133

APPLIED PSYCHOLOGICAL SERVICES, WAYNE, PA.
ELECTROCUTANEOUS SIGNALS USED WITH AUDITORY AND VISUAL STIMULI TO PROVIDE ALERTING AND WARNING SIGNS FOR RECEPTION OF MILITARY INFORMATION N66-16529

ARMY AVIATION HUMAN RESEARCH UNIT, FORT RUCKER, ALA.
AVIATOR PERFORMANCE IN LIGHT WEAPONS HELICOPTER DURING NAP-OF-EARTH FLIGHT SIMULATED COMBAT MISSION N66-16533

CONTROL ANALOG VERTICAL ATTITUDE INDICATOR AND VTOL FLIGHT DISPLAY FOR HELICOPTER PILOT TRAINING N66-16536

MISSION, PERSONNEL, AND HARDWARE DEMANDS OF LOW ALTITUDE NAVIGATION N66-16541

DAY-TO-DAY OPERATIONAL QUALITY CONTROL PROGRAM USED IN THE TRAINING OF ARMY HELICOPTER PILOTS N66-16544

PROGRAMMED INSTRUCTION TO LEARN BASIC OBSERVER SKILLS OF VISUAL SEARCH, TARGET RECOGNITION, GEOGRAPHIC ORIENTATION, AND TARGET LOCATION N66-16545

ARMY BIOLOGICAL LABS., FORT DETRICK, MD.
DRY HEAT EFFECTIVENESS IN MICROORGANISM STERILIZATION AT 105 DEG C FOR SPACE PROBE APPLICATIONS
NASA-CR-70321 N66-17088

PHYSICAL AND CHEMICAL PROPERTIES BY SEDIMENTATION AND SPECTRAL ANALYSIS FOR PURIFIED STAPHYLOCOCCAL ENTEROTOXIN B
AD-444380 N66-17644

ARMY DEPT., WASHINGTON, D. C.
ARMY AVIATION CAREER PROGRAM AND AVIATOR PERSONNEL REQUIREMENTS THROUGH 1968 N66-16542

ARMY MEDICAL LAB. /5TH/, ST. LOUIS, MO.
EQUIPMENT AND PROCEDURE DESCRIPTION FOR AIR SAMPLING BETA RADIATION FALLOUT MEASUREMENTS
RB-65-1 N66-16997

ARMY NATICK LABS., MASS.
BODY MEASUREMENTS OF PILOTS MADE DURING ANTHROPOMETRIC SURVEY - APPLICATIONS TO EQUIPMENT DESIGN N66-16534

ARMY PERSONNEL RESEARCH OFFICE, WASHINGTON, D. C.
EFFECTS OF CONSPICUITY CODING ON TIME REQUIRED AND ERRORS MADE IN LOCATING UPDATED INFORMATION ON INDIVIDUAL AND GROUP COMMAND SYSTEM DISPLAYS N66-16527

RIGHTS AND ERRORS KEYS AS REFERENCE SYSTEM FOR IMAGE INTERPRETATION BY HUMAN OPERATORS N66-16528

PREDICTING PILOT SUCCESS IN FIXED AND ROTARY WING AVIATION TRAINING BY USE OF TEST BATTERIES N66-16543

ARMY RESEARCH INST. OF ENVIRONMENTAL MEDICINE, NATICK, MASS.
EFFECTS OF CHANGING LOCATION OF VISUAL STIMULI ON SIMPLE REACTION TIMES OF ADULTS WITH NORMAL VISION N66-16539

ARMY RESEARCH OFFICE, WASHINGTON, D. C.
HUMAN FACTORS RESEARCH AND DEVELOPMENT DEALING WITH COMMUNICATION AND CONTROL, RECONNAISSANCE, PERFORMANCE DECREMENT IN AIR MOBILITY, AND ARMY AVIATION PERSONNEL AND TRAINING - CONFERENCE
AD-456363 N66-16526

ARMY TANK-AUTOMOTIVE COMMAND, CENTER LINE, MICH.
WHOLE-BODY HUMAN RESPONSE TO RANDOM AND SINUSOIDAL VIBRATION AT VARIOUS MODES N66-16535

B

BATTELLE-NORTHWEST, RICHLAND, WASH.
BIOLOGICAL RADIATION EXPOSURE STUDIES - LARGE PARTICLE INHALATION IN DOGS, INTRAGASTRIC AND SKIN EXPOSURE IN PIGS, INGESTED PARTICLES IN RATS, AND PLUTONIUM 28 INGESTION RATS
NASA-CR-70520 N66-18157

BOSE RESEARCH INST., CALCUTTA /INDIA/.
PHYSICAL AND CHEMICAL PROPERTIES OF ALPHA-LACTALBUMIN CRYSTALS PREPARED FROM GOAT MILK

N66-16363

BROOKHAVEN NATIONAL LAB., UPTON, N. Y.
BIOELECTRICITY HISTORICAL REVIEW AND PRINCIPLES OF MEMBRANE POTENTIAL - ELECTROPHYSIOLOGY
BNL-9337 N66-17175

THERMODYNAMIC PRINCIPLES OF ION TRANSFER ACROSS MEMBRANES FOR NUTRIENT AND EXCREMENT FLOW IN BIOLOGICAL SYSTEM - ELECTROPHYSIOLOGY
BNL-9338 N66-17176

AUTORADIOGRAPHIC METHOD USED FOR STUDIES OF GRANULOCYTOPOIESIS IN MAN
BNL-7955 N66-18287

C

CALIFORNIA UNIV., BERKELEY.
QUALITATIVE AND QUANTITATIVE TEST FOR ENZYME ACTIVITIES IN TERRESTRIAL SOIL ADAPTED TO MARS PROBE TELEMETRY PROCEDURES
NASA-CR-70058 N66-18163

CALIFORNIA UNIV., LA JOLLA.
PREFLIGHT, IN-FLIGHT, AND POSTFLIGHT TESTS OF VISUAL ACUITY AND CAPABILITY OF GEMINI V CREW MEMBERS N66-18011

CALIFORNIA UNIV., LOS ANGELES.
HUMAN ELECTROENCEPHALOGRAM GENERATOR SPECTRAL ANALYSIS IN POSTERIOR CEREBRAL REGIONS
NASA-CR-57050 N66-18389

CEKMECE NUCLEAR RESEARCH CENTER, ISTANBUL /TURKEY/.
EFFECT OF TRITIATED THYMIDINE AND GAMMA RADIATION ON MORTALITY OF DROSOPHILA MELANOGASTER LARVAE
CNAEM-16 N66-18103

PRODUCTION OF TOBACCO PLANT MUTANTS RESISTANT TO BLUE MOLD DISEASE BY SEED TREATMENT WITH IONIZING RADIATION - LITERATURE SURVEY
CNAEM-18 N66-18147

CHICAGO UNIV., ILL.
IODINE 125 FOR USE IN BONE DENSITOMETRY N66-17677

ESTROGENS USED IN POSTMENOPAUSAL OSTEOPOROSIS TO RETARD LOSS IN BONE MASS N66-17682

CHRYSLER CORP., NEW ORLEANS, LA.
PRESSURIZED SPACE SUITS TO SIMULATE WEIGHTLESSNESS AT ZERO GRAVITY - EFFECT OF CLOTHING CONSTRAINTS ON HUMAN PERFORMANCE
REL-HFG-65-1 N66-17386

ENERGY EXPENDITURE, METABOLIC HEAT PRODUCTION AND OXYGEN CONSUMPTION, AND WORK CAPACITY OF MEN CLOTHED IN SPACE SUITS N66-17395

COLLINS RADIO CO., CEDAR RAPIDS, IOWA.
COMPARISON OF TIME REQUIRED TO REMOVE AND REPLACE SPACECRAFT RADIOS UNDER SIMULATED WEIGHTLESSNESS ON DRY LAND AND UNDERWATER N66-17391

COMMISSARIAT A L ENERGIE ATOMIQUE, FONTENAY-AUX-ROSES /FRANCE/.
EVALUATION OF INTERNAL RADIATION DOSES - EFFECTIVE ENERGY OF ABSORBED RADIONUCLIDES AS FUNCTION OF HUMAN AGE
CEA-R-2809 N66-16222

NEUTRON ACTIVATION AND SCINTILLATION COUNTERS FOR DETECTION OF SODIUM AND POTASSIUM IN BIOLOGICAL MEDIA
CEA-R-2837 N66-17491

CORNELL UNIV., ITHACA, N. Y.
HYPERBARIC OXYGEN EFFECT ON MICRORGANISMS IN VITRO AND IN LIVE MICE GIVEN INFECTIOUS INJECTIONS N66-16955

D

DEUTSCHE VERSUCHSANSTALT FUR LUFT- UND RAUMFAHRT, BAD GODESBERG /WEST GERMANY/.
REGENERATIVE PROCESSES AND ORGANIC CHANGES IN ANIMALS FOLLOWING SHOCK WAVES
DVL-481 N66-18131

DUNLAP AND ASSOCIATES, INC., DARIEN, CONN.
SYSTEMS ANALYSIS NAVY ANTIAIRCRAFT WARFARE TRAINING PROGRAM
NAVTRADEVCEN-1574-1 N66-16640

HUMAN PERFORMANCE AND BEHAVIOR ASSESSMENT IN AIR FORCE SYSTEMS AND SUBSYSTEMS
SSD-65-172/514/R N66-16664

E

EUROPEAN ATOMIC ENERGY COMMUNITY, BRUSSELS /BELGIUM/.
RELATIONS BETWEEN LACTATE PRODUCTION, RESPIRATION, AND NUCLEAR DAMAGE IN IRRADIATED RAT THYMOCYTES
EUR-2623.E N66-18146

F

FEDERAL AVIATION AGENCY, OKLAHOMA CITY, OKLA.
AIR TRAFFIC CONTROL INCIDENT REPORTING SYSTEM DESIGN TO MAXIMIZE CORRECTIVE FEEDBACK
AM-65-10 N66-16583

SELF-REPORTED SYMPTOM INCIDENCE OF AIR TRAFFIC CONTROL PERSONNEL
AM-65-5 N66-16584

BIOMEDICAL SURVEY OF AIR TRAFFIC CONTROL FACILITIES - RELATIONSHIP OF EXPERIENCE AND AGING TO INCIDENCE OF STRESS SYMPTOMS
AM-65-6 N66-16669

SHOULDER SLOPE ANGLE OF FLYING PERSONNEL FOR IMPROVED SHOULDER HARNESS
AM-65-14 N66-17297

FELS RESEARCH INST., YELLOW SPRINGS, OHIO.
COMPARISON OF CORTICAL THICKNESS AND RADIOGRAPHIC MICRODENSITOMETER MEASUREMENTS IN DETERMINING BONE LOSS N66-17672

MINERAL CONTENT OF BONE CORTEX RELATED TO THICKNESS IN SECOND METACARPAL AS A FUNCTION OF AGE AND SEX N66-17673

AGE ASSOCIATED BONE LOSS MEASUREMENTS IN HANDS OF THREE RACES N66-17685

FLYING PERSONNEL RESEARCH COMMITTEE, LONDON /ENGLAND/.
OXYGEN SYSTEM FOR CREW OF EXECUTIVE JET AIRCRAFT, USING CONTINUOUS FLOW OF OXYGEN, FIXED CAPACITY RESERVIOR, AND PROVIDING SAFETY PRESSURE
FPRC/MEMO-207 N66-18054

FLIGHT CREW OXYGEN EQUIPMENT DEVELOPED FOR VC 10 TRANSPORT AIRCRAFT
FPRC/MEMO-208 N66-18055

FRANKLIN GNO CORP., WEST PALM BEACH, FLA.
SOFT X-RAY-RADIATION FOR BONE DENSITOMETRY USING GAMMA RADIOISOTOPE SOURCE IN PRECISION X-RAY TUBE N66-17676

G

GENERAL DYNAMICS/CONVAIR, SAN DIEGO, CALIF.
PRESSURIZED SUITS USED IN WATER IMMERSION STUDIES WHICH SIMULATE ZERO GRAVITY EFFECTS N66-17390

H

HANFORD ATOMIC PRODUCTS OPERATION, RICHLAND, WASH.
PHYSIOLOGICAL RESPONSE OF GERM CELLS IN FLOWER BEETLES, TRIBOLIUM CASTANEUM, TO X-RAY IRRADIATION
HW-SA-3747 N66-17833

HARVARD UNIV., BOSTON, MASS.
RENAL BLOOD FLOW AND EXTRACELLULAR VOLUME, RENAL AND CARDIAC EFFECTS ON SODIUM EXCRETION, AND ABNORMAL CIRCULATORY STATE EFFECTS ON CARDIAC

RATE AND BLOOD PRESSURE - DOG & HUMAN PHYSIOLOGY
*NASA-CR-70316 N66-17072

HENRY FORD HOSPITAL, DETROIT, MICH.
CORTICAL BONE THICKNESS MEASUREMENTS
N66-17686

HUMAN FACTORS RESEARCH, INC., LOS ANGELES, CALIF.
REVISION IN CINEMA METHOD IMPROVES GEOGRAPHIC ORIENTATION IN AIRCRAFT PILOTS DURING SIMULATED LOW ALTITUDE FLIGHT
TR-751-5 N66-17587

HUMAN SCIENCES RESEARCH, INC., MCLEAN, VA.
FIELD CRITERION TEST TO ASSESS SCANNING AND TARGET IDENTIFICATION SKILLS OF COMBAT ARMS OFFICERS
N66-16530

I

IIT RESEARCH INST., CHICAGO, ILL.
BACILLUS SPORE GERMINATION IN SIMULATED MARTIAN ENVIRONMENT
NASA-CR-70524 N66-18088

INSTITUT NATIONAL DE LA RECHERCHE AGRONOMIQUE, DIJON /FRANCE/.
GAMMA RADIATION EFFECTS ON CHIMAERAS OF FRUIT TREES
EUR-2546.F N66-18070

INSTITUT PASTEUR, PARIS /FRANCE/.
X-RAY AND GAMMA RAY EFFECTS ON DEOXYRIBONUCLEIC ACID /DNA/
EUR-2471.F N66-17938

INSTITUTE FOR CANCER RESEARCH, PHILADELPHIA, PA.
VIBRATING MIRROR FLYING SPOT ULTRAVIOLET MICROSCOPE WITH INCORPORATED TELEVISION SYSTEM - ULTRAVIOLET RADIATION EFFECTS ON CELL STRUCTURE AND BEHAVIOR
TID-21611 N66-17985

INSTITUTE FOR PERCEPTION RVO-TNO, SOESTERBERG /NETHERLANDS/.
INCREASE IN THRESHOLD FOR VISUAL PERCEPTION DURING EYE MOVEMENTS AND RETINAL ADAPTATION
AD-624790 N66-17022

INTERNATIONAL BUSINESS MACHINES CORP., ROCKVILLE, MD.
SYNTHESIS FRAMEWORK OF EXPERIMENT PROGRAM FOR ORBITING RESEARCH LABORATORIES APPLIED TO BIOMEDICINE/BEHAVIOR TO ASSURE PHYSIOLOGICAL SAFETY ON ADVANCED SPACE MISSIONS
NASA-CR-70356 N66-17053

SYNTHESIS FRAMEWORK OF EXPERIMENT PROGRAM FOR ORBITING RESEARCH LABORATORIES APPLIED TO BIOSCIENCE FOR DETERMINATION OF ORIGIN, NATURE, AND EVOLUTION OF LIFE
NASA-CR-70342, VOL. B, PT. XII N66-17058

ISOMET CORP., PALISADES PARK, N. J.
SOLID ELECTROLYTE CARBON DIOXIDE REDUCTION SYSTEM FOR SUBORBITAL FLIGHT
AMRL-TR-65-153 N66-16643

ISRAEL PROGRAM FOR SCIENTIFIC TRANSLATIONS, LTD., JERUSALEM.
PHYSIOLOGICAL RESPONSES IN HUMANS AND ANIMALS TO AIR EMBOLISMS AND PRESSURE ENVIRONMENTS IN DECOMPRESSION SICKNESS STUDIES
NASA-TT-F-358 N66-17126

PERMISSIBLE SUPERSATURATION COEFFICIENT IN HUMANS BREATHING AIR AND OXYGEN-HELIUM MIXTURE IN PRESSURE CHAMBER N66-17127

SUPERSATURATION COEFFICIENT AND DISSOLVED GAS TENSION RELATION IN GAS-LIQUID INTERACTION AT HIGH PRESSURES N66-17128

SUPERSATURATION OF ANIMALS AND HUMANS WITH GASES FOR DECOMPRESSION SICKNESS STUDIES
N66-17129

PERMISSIBLE SUPERSATURATION VALUE AFTER INHALATION OF AIR-HELIUM-OXYGEN MIXTURES AND DECOMPRESSION SICKNESS SYMPTOMS N66-17130

ANIMAL STUDIES ON SUPERSATURATION WITH NITROGEN AND INCREASED BODY RESISTANCE TO DECOMPRESSION SICKNESS N66-17131

DECOMPRESSION SICKNESS PROVOCATION BY EXPOSING ANIMALS TO HIGH ALTITUDE PRESSURE AFTER DECOMPRESSION N66-17132

DECOMPRESSION AIR EMBOLIC PROCESS IN ANIMALS AND PHYSIOLOGICAL RESPONSES N66-17133

PHYSIOLOGICAL RESPONSES IN RABBITS TO ARTIFICIAL EMBOLISM DUE TO INJECTIONS OF CARBON DIOXIDE, OXYGEN, AIR, AND HELIUM-OXYGEN MIXTURE
N66-17134

INCREASED TOLERANCE TO AIR EMBOLISM IN ANIMALS BY REPEATED INJECTIONS N66-17135

ARTIFICIAL AIR EMBOLISM AND DECOMPRESSION EFFECTS ON BLOOD OF DOGS N66-17136

TEMPERATURE EFFECTS ON DECOMPRESSION SICKNESS AND AIR EMBOLISM IN ANIMALS N66-17137

CIRCULATORY AND RESPIRATORY REACTIONS IN DOGS TO DECOMPRESSION AND ARTIFICIAL AIR EMBOLISM
N66-17138

ELECTRIC ANALOGY OF TISSUE GAS SATURATION UNDER SIMULATED DECOMPRESSION CONDITIONS
N66-17139

RESPIRATORY AND CIRCULATORY CHANGES IN DOGS DURING HIGH PRESSURE OXYGEN TOXICITY N66-17140

PATHOLOGICAL CHARACTERISTICS AND MECHANISM OF PULMONARY INVOLVEMENT IN HIGH PRESSURE OXYGEN TOXICITY IN GUINEA PIGS AND DOGS
N66-17141

HEART ACTIVITY DURING HIGH PRESSURE OXYGEN TOXICITY IN DOGS AND GUINEA PIGS
N66-17142

CIRCULATING BLOOD VOLUME CHANGES IN DOGS BREATHING OXYGEN UNDER PRESSURE N66-17143

ADSORPTION CHANGES IN NERVOUS SYSTEM AND INTERNAL ORGANS OF MICE DURING OXYGEN-INDUCED CONVULSIONS
N66-17144

PRESSURE CHAMBER EXPERIMENTS FOR STUDYING CHANGES IN MOTOR, CADIOVASCULAR, RESPIRATORY, AND CENTRAL NERVOUS SYSTEMS DURING OXYGEN TOXICITY
N66-17145

LONG TERM HEMODYNAMIC CHANGES IN DOGS UNDER HIGH PARTIAL PRESSURE OF OXYGEN N66-17146

HYPEROXEMIC AND HYPOXEMIC CONVULSION EFFECTS ON SUGAR, LACTIC ACID, AND INORGANIC PHOSPHORUS LEVELS IN DOG BLOOD AND SPINAL FLUID
N66-17147

HIGHER NERVOUS ACTIVITY CHANGES IN STIMULUS RESPONSE FOR DOGS UNDER RAREFIED AIR AND ANOXIC CONDITIONS N66-17148

CONDITIONED RESPONSE BEHAVIOR OF DOGS UNDER ACUTE HYPOXIA N66-17149

DINITROPHENOL-INDUCED HYPERTHERMIA UNDER ALTERED PARTIAL PRESSURES OF OXYGEN AND CARBON DIOXIDE
N66-17150

INCREASED CARBON DIOXIDE CONTENT EFFECT ON ANIMAL BREATHING IN GAS PRESSURE CHAMBER
N66-17151

HUMAN BODY ADAPTIVE REACTION TO INCREASED AIR PRESSURE BASED ON HIGHER NERVOUS SYSTEM STUDY
N66-17152

PULMONARY PRESSURE TRAUMA MECHANISM DURING AIR AND

OXYGEN BREATHING N66-17153

EFFECT OF OXYGEN BREATHING IN RESORPTION OF GAS EMBOLISM IN VASCULAR SYSTEM OF CATS AND ON COURSE OF PULMONARY PRESSURE TRAUMA N66-17154

TREATMENT OF PULMONARY PRESSURE TRAUMA BY REMOVAL OF EXCESS GAS FROM INTERPLEURAL CAVITIES N66-17155

ROLE OF PROPRIOCEPTIVE IMPULSES DURING RESPIRATION WITH INCREASED INTRAPULMONARY PRESSURE IN REGULATING RESPIRATION AND CIRCULATION N66-17156

CHANGES IN CAROTID SINUS PRESSOR AND DEPRESSOR REFLEXES DURING RESPIRATION UNDER INCREASED INTRAPULMONARY PRESSURE N66-17157

ROLE OF VAGUS NERVES IN CIRCULATORY AND RESPIRATORY REACTIONS DURING INCREASED INTRAPULMONARY PRESSURE N66-17158

EFFECT OF GAS EXPANSION IN GASTROINTESTINAL TRACT DURING BAROMETRIC PRESSURE CHANGES ON RESPIRATORY AND CARDIOVASCULAR REFLEXES N66-17159

RECOMPRESSION TREATMENT OF INTRAPULMONARY PRESSURE TRAUMA N66-17160

TREATMENT OF SEVERE SPINAL FORM OF DECOMPRESSION SICKNESS N66-17161

TOXIC EFFECT OF HIGH PARTIAL OXYGEN PRESSURE NOTED IN CONSTRICTION OF PERIPHERAL VISUAL FIELD N66-17162

J

JOINT PUBLICATIONS RESEARCH SERVICE, WASHINGTON, D. C.

REPORTS FROM U.S.S.R. ACADEMY OF MEDICAL SCIENCES ON CORTICOSTEROIDS, STEROID HORMONES, DIABETES, THYROID GLAND AND PANCREAS DISEASES, AUTORADIOGRAPHY, AND ELECTROCARDIOGRAPHY
JPRS-33643 N66-16244

SELF REGULATION AND MEMORY LOCATION IN HUMAN BRAIN
JPRS-33898 N66-16258

MONOCHROMATIC RED, WHITE, GREEN, AND BLUE SOLAR LIGHT RADIATION EFFECT ON PLANT GROWTH, DEVELOPMENT, AND YIELD N66-16275

MATHEMATICAL DESCRIPTION OF CONTINUOUS CULTURING OF MICROALGAE
JPRS-33831 N66-16315

IMMUNOLOGIC PROBLEMS OF SPACE BIOLOGY AND MEDICINE
JPRS-33922 N66-16324

PHYSIOLOGY OF CHRONIC ADAPTATION TO HIGH ELEVATIONS - ACCLIMIZATION
JPRS-33871 N66-16325

PHYSICAL PARAMETERS OF BIOLOGICAL LIVING SYSTEMS AND THEIR OPERATIONAL RELATIONSHIPS
JPRS-33830 N66-16397

ALGAE GROWTH EXPERIMENTS AND APPLICATIONS - SPACE FLIGHT NUTRITION, FOOD, AND AGRICULTURE
JPRS-34012 N66-16499

BASIC PRINCIPLES OF STIMULATED ELECTROAUDITORY PERCEPTION N66-16819

GENERAL MODEL OF SPEECH DISCRIMINATION USED TO REFORMULATE MOTOR THEORY OF PERCEPTION
JPRS-34106 N66-16954

SIMULATED MANNED FLIGHT IN SPACE TRAINING CAPSULE
JPRS-33934 N66-17620

ROLE OF PITUITARY AND ADRENAL GLANDS IN GENESIS OF AND RECOVERY FROM RADIATION PATHOLOGICAL SYMPTOMS
JPRS-34120 N66-17623

LOGIC DIAGRAMS OF PILOT ACTION IN EMERGENCY SITUATION
JPRS-34200 N66-17638

WEIGHTLESSNESS EFFECTS ON CIRCULATORY SYSTEM AND MUSCULAR ACTIVITY OF ANIMALS AND HUMANS DURING SPACE FLIGHTS
JPRS-34064 N66-18028

POSSIBLE APPLICATION OF HYPOTHERMIA STATE FOR LONG PERIODS OF SPACE FLIGHT
JPRS-34093 N66-18036

HEURISTIC PROGRAMMING, CYBERNETICS AND PSYCHOLOGY OF REASONING, AND AUTOMATION OF HUMAN INTELLECT
JPRS-34182 N66-18051

DEFINITIONS OF LIFE ON EARTH, AND HABITABILITY OF OTHER PLANETS IN UNIVERSE
JPRS-34259 N66-18064

CONFERENCE ON PROBLEMS OF USING DEEP HYPOTHERMIA IN TREATING CLINICAL DEATH
JPRS-33971 N66-18094

K

KANSAS STATE UNIV., MANHATTAN.

PERCEPTUAL REFERENCE FRAME EVALUATION, AND PHYSIOLOGICAL RESPONSES TO UNUSUAL ENVIRONMENTS, AUDITORY SIGNALS, STRUCTURELESS VISUAL FIELD EXPOSURE, AND STIMULI
AD-623869 N66-16506

ENVIRONMENT CONCEPT AS PSYCHOLOGICAL FACTOR, AND PERTINENT LITERATURE REVIEW
TR-33 N66-16507

LITERATURE REVIEW OF HUMAN REACTIONS TO STRUCTURELESS VISUAL FIELD EXPOSURE
TR-34 N66-16508

RELATIONAL DETERMINATION OF BEHAVIOR, AND SIGNIFICANT RELATIONSHIPS BETWEEN RESPONSE VARIABLES AND BEHAVIORALLY EFFECTIVE PROPERTIES OF STIMULI
TR-35 N66-16509

RESPONSE LATENCY CHANGES FOLLOWING SIGNAL PITCH SHIFTS, AND ADAPTATION-LEVEL THEORY EVALUATION
TR-36 N66-16510

L

LABORATOIRES DU CENTRE D ETUDE DE L ENERGIE NUCLEAIRE, MOL /BELGIUM/.

PREPARATION, PROPERTIES, AND STORAGE STABILITY OF MACROMOLECULES LABELLED BY TRITIUM AND BY BIOLOGICAL SYNTHESIS - NUCLEIC ACIDS, LYSOZYME, AND RIBONUCLEASE
EUR-2419.F N66-16439

LEEDS UNIV. /ENGLAND/.

CORTICAL BONE VOLUME AND LUMBAR SPINE DENSITY RELATED TO AGING IN WOMEN - X-RAY MEASUREMENTS OF RELATIVE VERTEBRAL DENSITY N66-17669

MEASUREMENTS OF BONE VOLUME AND VERTEBRAL DENSITY N66-17681

LIBRARY OF CONGRESS, WASHINGTON, D. C.

SOVIET ABSTRACTS ON PROBLEMS OF SPACE BIOLOGY N66-16933

LITTLE /ARTHUR D./, INC., CAMBRIDGE, MASS.

PASSIVE TEMPERATURE CONTROL FOR EXTRAVEHICULAR SPACE SUITS
AMRL-TR-65-156 N66-16743

LOCKHEED-CALIFORNIA CO., BURBANK.

PRESSURIZED SPACE SUIT EFFECTS ON HUMAN PERFORMANCE IN FRICTIONLESS ENVIRONMENT N66-17392

LOUISVILLE UNIV., KY.

ELECTRIC SPARK STIMULATION OF SKIN FOR STUDY OF SINGLE SENSORY UNITS

AD-624848 N66-17120

M

MARYLAND UNIV., COLLEGE PARK.
ONE-DIMENSIONAL ISING MODEL TO EXPLAIN MELTING TEMPERATURE LINEAR DEPENDENCE OF COPOLYMERIC D NA
BN-425 N66-17005

MASSACHUSETTS GENERAL HOSPITAL, BOSTON.
SOLID CHEMICAL SYSTEM FOR CHARGED PARTICLE DOSIMETRY
NASA-CR-70462 N66-17481

MASSACHUSETTS INST. OF TECH., BROOKLINE.
BIBLIOGRAPHY OF GLIA CELL STUDIES
NASA-CR-70631 N66-18316

MASSACHUSETTS INST. OF TECH., CAMBRIDGE.
FUNCTIONAL EXTENSION OF HUMAN HANDS THROUGH REMOTE CONTROL MACHINE
NASA-CR-69856 N66-16394

RESISTANCE EVALUATION OF NATURAL SOURCE SPORE ISOLATES TO INACTIVATION BY THERMAL SHOCK
NASA-CR-70029 N66-16712

MEDICAL BIOLOGICAL LAB. RVO-TNO, RIJSWIJK /NETHERLANDS/.
MILK RADIOACTIVITY DETERMINATION AFTER ATOMIC ATTACK BY GEIGER- MUELLER COUNTING TUBE
MBL/1965/22 N66-17483

RADIATION CHIMERA MORTALITY RATE IN RELATION TO NUMBER OF TRANSPLANTED BONE MARROW AND LYMPH NODE CELLS
MBL/1965/23 N66-17484

MELPAR, INC., FALLS CHURCH, VA.
COMPUTER PROGRAM TO SIMULATE SECOND ORDER SERVO SYSTEM DYNAMICS UNDER AUTOMATIC AND MANUAL CONTROL
NASA-CR-70340 N66-17082

MIAMI UNIV., CORAL GABLES, FLA.
CATALYTIC ACTIVITY AND CHEMICAL PROPERTIES OF POLY-ALPHA-AMINO ACIDS AND POLYNUCLEOTIDES
NASA-CR-70384 N66-17273

MICHIGAN UNIV., ANN ARBOR.
IONIZING RADIATION EFFECT ON SUBMICROSCOPIC STRUCTURES OF IRRADIATED FROGS AND RESULTING ALTERATIONS IN METABOLIC FUNCTIONS
COO-1080-1 N66-17943

N

NATIONAL ACADEMY OF SCIENCES-NATIONAL RESEARCH COUNCIL, WASHINGTON, D. C.
DEHYDRATION AND WEIGHTLESSNESS IN MANNED SPACE FLIGHT N66-16428

HUMAN ENGINEERING AND PERFORMANCE CONSIDERATIONS IN SPACECRAFT DESIGN AND SPACE FLIGHT MISSIONS N66-16429

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION. AMES RESEARCH CENTER, MOFFETT FIELD, CALIF.
POWERED TRIM CHANGES AFFECTING PILOT DURING SIMULATED LANDING FOR SHORT TAKE OFF AND LANDING AIRCRAFT
NASA-TN-D-3246 N66-16550

ANOMERIC SPECIFICITY OF YEAST GALACTOKINASE BY CHROMATOGRAPHIC METHODS
NASA-TM-X-56057 N66-17218

EFFECTS OF HIGH LUMINANCE SOURCES UPON VISIBILITY OF POINT SOURCES
NASA-TM-X-56581 N66-18332

ANATOMY OF CENTRE MEDIAN NUCLEUS OF LUYS
NASA-TM-X-56159 N66-18369

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION. GODDARD SPACE FLIGHT CENTER, GREENBELT, MD.
MICROORGANIC CONTAMINATION OF STAINLESS STEEL DUE TO HANDLING BY PERSONNEL
NASA-TM-X-55408 N66-17240

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION. LANGLEY RESEARCH CENTER, LANGLEY STATION, VA.
TRACKING STUDY TO DETERMINE MAXIMUM CONTROL ELEMENT LAG AND MAXIMUM AND MINIMUM CONTROL SENSITIVITY TOLERATED IN MANUALLY CONTROLLED COMPENSATORY TRACKING TASK
NASA-TN-D-3242 N66-16548

POTENTIAL SOURCES AND METHODS DESCRIPTION FOR SPACE VEHICLE WATER RECOVERY INCLUDING MISSION WEIGHT PENALTIES
NASA-TM-X-56123 N66-17221

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION. MANNED SPACECRAFT CENTER, HOUSTON, TEX.
SPACE SUIT DEVELOPMENT STATUS
NASA-TN-D-3291 N66-16942

PORTABLE LIFE SUPPORT SYSTEM AND PRESSURIZED SUIT FOR EXTRAVEHICULAR MOBILITY UNIT TO PROTECT MAN AGAINST LUNAR SURFACE AND FREE SPACE HAZARDS N66-17387

EFFICACY OF CARDIOVASCULAR CONDITIONING WITH PULSATILE LEG CUFF TECHNIQUE IN DECREASING ORTHOSTATIC HYPOTENSION OF GEMINI V ASTRONAUTS N66-18012

EVALUATION OF PHYSICAL CONDITION OF GEMINI V ASTRONAUTS BY CARDIOVASCULAR SYSTEM RESPONSE TO CALIBRATED WORK LOAD N66-18013

EFFECT OF WEIGHTLESSNESS AND IMMOBILIZATION ON BONE DEMINERALIZATION OF PRIMARY AND BACKUP GEMINI V CREW USING RADIOGRAPHIC BONE DENSITOMETRY N66-18014

PSYCHOPHYSIOLOGICAL RESPONSES IN HUMANS TO LOW FREQUENCY PRESSURE OSCILLATIONS
NASA-TN-D-3323 N66-18432

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION. MARSHALL SPACE FLIGHT CENTER, HUNTSVILLE, ALA.
MAINTENANCE OF SPACE VEHICLES DURING SHORT PERIODS OF SIMULATED WEIGHTLESSNESS BY WORKERS WEARING PRESSURIZED SUITS N66-17389

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION, WASHINGTON, D. C.
ANNOTATED BIBLIOGRAPHY ON EXTRATERRESTRIAL LIFE
NASA-SP-7015 N66-16566

PRINCIPLES AND RELATIONSHIPS TO REGULATIVE PROCESSES IN HUMANS - OXYGEN DEFICIENCY TESTS
NASA-TT-F-9737 N66-16574

DETERMINING THICKNESS AND MINERAL CONTENT IN VERTEBRA AND OTHER BONES BY X-RAY AND OTHER DENSITOMETRY - APPLICATION OF TECHNIQUES TO HUMAN STUDIES
NASA-SP-64 N66-17666

RESEARCH IN EXOBIOLOGY, ENVIRONMENTAL BIOLOGY, BEHAVIORAL BIOLOGY, MOLECULAR BIOLOGY AND BIOINSTRUMENTATION, SPACE FLIGHT PROGRAMS, AND MANNED SPACE FLIGHT
NASA-SP-92 N66-17778

AEROSPACE MEDICINE AND BIOLOGY - CONTINUING BIBLIOGRAPHY WITH ABSTRACTS
NASA-SP-7011/21/ N66-17886

ORGANIC SYSTEMS AND BIOGENESIS - ABSTRACTS
NASA-TT-F-9863 N66-18448

NATIONAL INSTITUTES OF HEALTH, BETHESDA, MD.
THEORETICAL ASPECTS OF RADIOGRAPHIC DENSITOMETRY USED TO DETERMINE MINERAL CONTENT IN BONE N66-17667

NAVAL AIR ENGINEERING CENTER, PHILADELPHIA, PA.
PHYSIOLOGICAL ENERGY EXPENDITURE FROM DONNING FULL PRESSURE SUIT UNDER SPACE AND TIME LIMITATIONS N66-17394

NAVAL RADIOLOGICAL DEFENSE LAB., SAN FRANCISCO, CALIF.
HOMOGRAFT RESPONSE AND HEMAGGLUTININ PRODUCTION BY SENSITIZED THYMECTOMIZED IRRADIATED ADULT MICE
USNRDL-TR-920 N66-17065

NAVAL RESEARCH LAB., WASHINGTON, D. C.
EFFECTS OF LIGHT INTENSITY AND CULTURE DENSITY ON ALGAL OXYGEN PRODUCTION
NRL-6331 N66-16214

NAVAL SCHOOL OF AVIATION MEDICINE, PENSACOLA, FLA.
PSYCHOLOGICAL AND PHYSIOLOGICAL TESTING IN SUCCESS PREDICTION IN FLIGHT TRAINING PROGRAMS
NASA-CR-69895 N66-16192

CONSTRAINT PLATFORM AND BIOTELEMETRY MODULE FOR HUMAN BALLISTOCARDIOGRAM AND ELECTROCARDIOGRAM IN ZERO GRAVITY ENVIRONMENT
NASA-CR-69828 N66-16283

EFFECTS OF STREPTOMYCIN SULFATE IN TREATMENT OF ENDOLYMPHATIC HYDROPS - MENIERES DISEASE
NASA-CR-69862 N66-16446

PREDICTION FORMULAE FOR PERSONNEL SELECTION BASED ON PROCUREMENT SOURCE AND SUCCESS OF OFFICER FLIGHT STUDENTS
AD-623826 N66-16503

VALIDITY OF BRIEF VESTIBULAR DISORIENTATION TEST IN SCREENING PILOT TRAINEES
NASA-CR-70146 N66-16603

PHYSIOLOGICAL RESPONSES TO ANTIMOTION SICKNESS DRUGS - ANTIHISTAMINES, BELLADONNAS, AND PHENOTHIAZINES
NASA-CR-70175 N66-16971

VESTIBULAR DISORIENTATION TEST VALIDITY IN SCREENING PILOT TRAINEES
NASA-CR-70306 N66-17079

VESTIBULAR SENSITIVITY AND ASSOCIATED LOCOMOTOR RESPONSES OF RATS IN ROTATING ENVIRONMENT
NASA-CR-70394 N66-17271

ARCHITECTURE AND STRUCTURE OF OTOLITH END ORGAN
NASA-CR-70393 N66-17272

EFFECT OF PROLONGED WEIGHTLESSNESS ON OTOLITH FUNCTION AND HORIZONTALITY MEASUREMENTS IN ABSENCE OF GRAVITY AND VISUAL CUES
N66-18015

DELAYED SEA URCHIN EGG MITOSIS BY HIGH MAGNETIC FIELD - TESTING METHODS FOR MAGNETIC FIELD-FREE ENVIRONMENT
NASA-CR-70632 N66-18318

NAVAL SUBMARINE MEDICAL CENTER, GROTON, CONN.
FROG RESPIRATORY SYSTEM CILIARY MUCOUS TRANSPORT DECREMENT IN CLOSED CONTROLLED SUBMARINE CABIN ATMOSPHERE - ANIMAL STUDY
REPT.-443 N66-16990

PERIPHERAL AUTONOMIC NERVOUS SYSTEM INDICES VALIDITY STUDY FOR PREDICTING INDIVIDUAL ADJUSTMENT RESPONSE TO ENVIRONMENTAL STRESS
AD-624783 N66-16991

NAVAL TRAINING DEVICE CENTER, PORT WASHINGTON, N. Y.
GALVANIC SKIN RESPONSE, HEART RATE, AND MUSCLE ACTION BIOELECTRIC POTENTIAL SIGNALS AS PSYCHOPHYSIOLOGICAL RESPONSE TO LEARNING TASK DIFFICULTY
NAVTRADEVCEN-IH-34 N66-16639

NORSK RADIUMHOSPITAL, OSLO.
HIGH ENERGY ELECTRON PHOTOGRAPHIC ISODOSE MEASUREMENTS IN INHOMOGENEOUS MEDIA
CONF-640918-2 N66-17546

NORTH AMERICAN AVIATION, INC., COLUMBUS, OHIO.
TASK LOADING EFFECTS ON PILOT PERFORMANCE DURING SIMULATED LOW ALTITUDE, HIGH SPEED, TERRAIN FOLLOWING MISSIONS N66-16540

O

OHIO STATE UNIV., COLUMBUS.
EXPERIMENT TO DETERMINE CHICKEN REACTION TO 100 PERCENT OXYGEN AT ATMOSPHERIC PRESSURE
NASA-CR-60380 N66-18391

P

PENNSYLVANIA STATE UNIV., UNIVERSITY PARK.
QUANTITATIVE RADIOGRAPHY OF BONE MASS AND DENSITY MEASURED BY X-RAYS N66-17668

PHARMATOX LABS., INC., AMES, IOWA.
PERCUTANEOUS TOXICITY IN ANIMALS AND RELATED INDUSTRIAL HAZARDS IN RARE EARTH PROCESSING
TID-22294 N66-17950

PHILCO CORP., WILLOW GROVE, PA.
MYOELECTRIC POTENTIAL RESPONSE AND FORCE OF MUSCLE CONTRACTION
REPT.-2386 N66-16308

PUBLIC HEALTH SERVICE, CINCINNATI, OHIO.
REGENERATIVE WASTE DISPOSAL SYSTEM SUPPLYING PHYSIOLOGICAL REQUIREMENTS FOR HUMANS IN SPACE CRAFT
PB-168787 N66-17429

PURDUE UNIV., LAFAYETTE, IND.
STOCHASTIC AUTOMATIC MODELS FOR SYNTHESIS OF LEARNING SYSTEMS
TR-EE65-17 N66-17615

R

RAND CORP., SANTA MONICA, CALIF.
HISTORICAL BACKGROUND AND APPLICATIONS OF CYBERNETICS WHICH PERMITS THEORY RELATING INFORMATION PROCESSING TO LEARNING, THINKING, AND UNDERSTANDING
P-3144 N66-16946

RESEARCH ANALYSIS CORP., MCLEAN, VA.
HELICOPTER RECONNAISSANCE TACTICS FOR AIR CAVALRY UNITS DURING WINTER ENVIRONMENT
N66-16531

S

SAHA INST. OF NUCLEAR PHYSICS, CALCUTTA /INDIA/.
STRUCTURAL RELATION OF ABNORMAL CALCIFICATIONS WITH COLLAGEN MATRIX IN DISEASED HUMAN BONES - STUDY OF BONE DYSPLASIA BY X-RAY DIFFRACTION
N66-16362

SAN FERNANDO VALLEY STATE COLL., NORTHRIDGE, CALIF.
OUTPUT CHARACTERISTICS, PERFORMANCE DECREMENT FROM WEARING PRESSURIZED SUITS, AND LIFE SUPPORT REQUIREMENTS IN SPACE ENVIRONMENT
N66-17393

SIENA UNIV. /ITALY/.
BEHAVIOR REFLEX REGULATION OF DECORTICATE CAT, NEURAL MECHANISMS RESPONSIBLE FOR DEEP SLEEP, AND REFLEXES IN CIRCULATION REGULATION DURING SLEEP
AFOSR-65-1579 N66-16469

SPACELABS, INC., VAN NUYS, CALIF.
FEASIBILITY OF MULTIPLE BIO-ELECTRODE ARRAYS TO SENSOR GALVANIC SKIN RESPONSE SIGNALS DURING BODY MOVEMENT
NASA-CR-70532 N66-18068

STANFORD UNIV., CALIF.
OPTICAL PROPERTIES OF AMINO ACIDS USING MASS SPECTROMETRY AND GAS CHROMATOGRAPHY
AFOSR-65-1632 N66-16516

PERMEABILITY MEASUREMENTS FOR DIFFUSION OF CARBON DIOXIDE AND GLUCOSE THROUGH SILICON RUBBER AND TEFLON IN STUDY OF ENZYMATIC BREAKDOWN PRODUCTS SEPARATION
NASA-CR-70190 N66-16968

SUMERLIN MEMORIAL PATHOLOGY LAB., SAN DIEGO, CALIF.
ASH CONCENTRATION, FEMORAL THICKNESS, AND VERTEBRAL MINERALIZATION RELATED TO AGING IN HUMANS N66-17680

T

TECHNICAL OPERATIONS RESEARCH, FORT BENNING, GA.
TREE-TOP ALTITUDE NAVIGATION FOR RECONNAISSANCE MISSION - ROLE OF AIRCRAFT TYPE, MISSION LENGTH, ILLUMINATION, WEATHER, AND CREW EXPERIENCE N66-16532

TEXAS WOMENS UNIV., DENTON.
RADIOGRAPHIC BONE DENSITOMETRY FOR BONE MASS DETERMINATIONS IN OS CALCIS, MIDDLE PHALANX OF FIFTH DIGIT, AND PATELLA N66-17670

FACTORS AFFECTING RADIOGRAPHIC DENSITOMETRY OF LUMBAR SPINE AND FEMORAL NECK N66-17671

CALCIUM METABOLISM AND BONE MASS CHANGES RESULTING FROM CONTINUOUS PERIODS OF BED REST N66-17683

REGRESSION CURVES COMPUTED FROM URINARY CALCIUM EXCRETION AND BONE MASS DATA OBTAINED FROM MEN IN BED REST AND AMBULATORY STUDIES N66-17684

U

UNITED KINGDOM ATOMIC ENERGY AUTHORITY, HARWELL /ENGLAND/.
SLOW NEUTRON CALIBRATION OF FILM AND GAMMA DOSIMETERS
AERE-R-4960 N66-18214

W

WASHINGTON UNIV., SEATTLE.
ULTRASONIC METHODS TO MEASURE BONE MASSES AND OTHER TISSUES IN SITU N66-17679

WISCONSIN UNIV., MADISON.
BONE MINERAL MEASUREMENTS BY PHOTON ABSORPTION WITH IMPROVED SCANNING DEVICE N66-17674

BONE MINERAL CONTENT IN DOMESTIC HEN MEASURED BY ATTENUATION OF MONOENERGETIC PHOTON BEAM N66-17675

Personal Author Index

AEROSPACE MEDICINE AND BIOLOGY / *a continuing bibliography* MAY 1966

Listing of Personal Authors of Reports

A Notation of Content, rather than the title of the document, appears under each author's name. The accession number is located beneath and to the right of the Notation of Content, e.g., N66-12345. Under any one author's name, the accession numbers are arranged in sequence.

A

ABELMAN, W. H.
RENAL BLOOD FLOW AND EXTRACELLULAR VOLUME, RENAL AND CARDIAC EFFECTS ON SODIUM EXCRETION, AND ABNORMAL CIRCULATORY STATE EFFECTS ON CARDIAC RATE AND BLOOD PRESSURE - DOG & HUMAN PHYSIOLOGY
NASA-CR-70316 N66-17072

ADAMS, J. J.
TRACKING STUDY TO DETERMINE MAXIMUM CONTROL ELEMENT LAG AND MAXIMUM AND MINIMUM CONTROL SENSITIVITY TOLERATED IN MANUALLY CONTROLLED COMPENSATORY TRACKING TASK
NASA-TN-D-3242 N66-16548

ADAMS, T.
PHASE SHIFTING OF HUMAN CIRCADIAN SYSTEM DURING TRANSCONTINENTAL JET FLIGHTS A66-80547

ADAMS, W. R.
ACUTE INHALATION TOXICITY OF OXYGEN DIFLUORIDE IN ALBINO RAT A66-19723

ADEY, W. R.
CEREBRAL CORTEX AND SUBCORTEX RELATIONSHIPS IN CHIMPANZEE DURING SLEEP, WAKEFULNESS, AND RAPID EYE MOVEMENT STATE A66-80704

HUMAN ELECTROENCEPHALOGRAM GENERATOR SPECTRAL ANALYSIS IN POSTERIOR CEREBRAL REGIONS
NASA-CR-57050 N66-18389

ADLER, S.
IRRELEVANT INFORMATION EFFECTS ON SHORT-TERM RETENTION OF RELEVANT INFORMATION
A66-80583

ADOLPH, R. J.
TRANSDUCER FOR RECORDING INSTANTANEOUS RESPIRATORY WAVEFORMS IN ANIMALS AND MAN A66-80624

AFANASEV, N. A.
RECOMPRESSION TREATMENT OF INTRAPULMONARY PRESSURE TRAUMA N66-17160

AFFENS, W. A.
EFFECTS OF LIGHT INTENSITY AND CULTURE DENSITY ON ALGAL OXYGEN PRODUCTION
NRL-6331 N66-16214

AGNON, J.
CONCENTRATION AND DILUTION OF URINE IN PERMANENT INHABITANTS AT REST AND EXERCISE IN HOT ENVIRONMENT AS RELATED TO FLUID INTAKE
A66-80685

ALBE-FESSARD, D.
RELATION OF DIENCEPHALIC ALTERATIONS TO ELECTROENCEPHALOGRAM CORTICAL ACTIVITY AND SLEEP IN CATS A66-80694

ALEKSANDROV, A. I.
PERMISSIBLE SUPERSATURATION COEFFICIENT IN HUMANS BREATHING AIR AND OXYGEN-HELIUM MIXTURE IN PRESSURE CHAMBER N66-17127

ALFANO, A.
THERAPEUTIC USES OF OXYGEN AT HIGH PRESSURE AND PREVENTION OF ITS TOXICITY IN RATS
A66-80644

ALTMAN, I.
INTERPERSONAL EXCHANGE IN ISOLATION
A66-80641

AMBLER, R. K.
VALIDITY OF BRIEF VESTIBULAR DISORIENTATION TEST IN SCREENING PILOT TRAINEES A66-80559

VALIDITY OF BRIEF VESTIBULAR DISORIENTATION TEST IN SCREENING PILOT TRAINEES
NASA-CR-70146 N66-16603

VESTIBULAR DISORIENTATION TEST VALIDITY IN SCREENING PILOT TRAINEES
NASA-CR-70306 N66-17079

AMBROSANIO, G.
THERAPEUTIC USE OF ACETYLASPARTIC ACID-CITRULLINE PREPARATION IN FLIGHT FATIGUE DURING SPORT FLYING A66-80721

AMMONS, C. H.
SELECTED BIBLIOGRAPHY ON STUDIES IN PERCEPTION
A66-80512

AMMONS, R. B.
SELECTED BIBLIOGRAPHY ON STUDIES IN PERCEPTION
A66-80512

ANDEL, J.
COMPUTATIONAL ANALYSIS EMPLOYING DIGITAL COMPUTERS TO EVALUATE HYPOXIC STRESS REACTIONS IN MAN
A66-17659

ANDERSEN, B. W.
SYSTEMS ANALYSIS NAVY ANTIAIRCRAFT WARFARE TRAINING PROGRAM
NAVTRADEVCEN-1574-1 N66-16640

ANDERSON, B., JR.
EFFECT OF HYPERBARIA AND HYBAROXIA ON CALIBER OF RETINAL AND CEREBRAL VESSELS IN MAN
A66-80581

ANDERSON, E. N.
DAY-TO-DAY OPERATIONAL QUALITY CONTROL PROGRAM USED IN THE TRAINING OF ARMY HELICOPTER PILOTS
N66-16544

ANDERSON, J.
CORTICAL BONE VOLUME AND LUMBAR SPINE DENSITY RELATED TO AGING IN WOMEN - X-RAY MEASUREMENTS OF RELATIVE VERTEBRAL DENSITY N66-17669

MEASUREMENTS OF BONE VOLUME AND VERTEBRAL DENSITY
N66-17681

ANDO, K.
EYE MOVEMENTS OF WAKING NORMAL SUBJECTS AND SCHIZOPHRENICS WITH CLOSED EYES
A66-80661

ANDREASSI, J. L.
GALVANIC SKIN RESPONSE, HEART RATE, AND MUSCLE ACTION BIOELECTRIC POTENTIAL SIGNALS AS PSYCHOPHYSIOLOGICAL RESPONSE TO LEARNING TASK DIFFICULTY
NAVTRADEVCEN-IH-34 N66-16639

ANDREW, G. M.
VENTILATION, OXYGEN CONSUMPTION, CARDIAC OUTPUT, AND HEART RATE OF ATHLETIC AND NONATHLETIC SUBJECTS EXERCISING AT THREE LEVELS BEFORE AND AFTER TRAINING A66-80607

ANDREWS, P. A.
NOCTURNAL BODY TEMPERATURE, SWEATING RATE, AND DEPTH OF SLEEP MONITORED BY ELECTRONCEPHALOGRAPHY
A66-80610

ANTIPOV, V. V.
COSMIC RADIATION HAZARDS AND EFFECT ON MAN AND ANIMALS IN RELATION TO SOLAR ACTIVITY AND FLIGHT DURATION A66-80519

RADIATION EXPOSURE OF ASTRONAUTS DURING LUNAR MISSIONS A66-80683

COMBINED EFFECT OF ACCELERATION AND RADIATION ON PHYSIOLOGICAL FUNCTION IN MICE A66-80740

ARNOLD, J. S.
ASH CONCENTRATION, FEMORAL THICKNESS, AND VERTEBRAL MINERALIZATION RELATED TO AGING IN HUMANS N66-17680

ARSENEVA, M. A.
EFFECTS OF VIBRATION, ACCELERATION AND IRRADIATION ON CHROMOSOMES IN MICE A66-80741

ARSENEVA, V. I.
CIRCULATORY AND RESPIRATORY REACTIONS IN DOGS TO DECOMPRESSION AND ARTIFICIAL AIR EMBOLISM
N66-17138

ARUIN, L. I.
ADSORPTION CHANGES IN NERVOUS SYSTEM AND INTERNAL ORGANS OF MICE DURING OXYGEN-INDUCED CONVULSIONS
N66-17144

ASCHOFF, J.
SUMMARIES OF RESEARCH AND PRESENT KNOWLEDGE OF BIOLOGICAL RHYTHMS IN PLANTS AND ANIMALS
A66-80514

RESPONSE CURVES IN CIRCADIAN PERIODICITY - SYNCHRONIZATION AND PHASE SHIFT IN ANIMALS AND PLANTS A66-80526

PHASE-ANGLE DIFFERENCE IN CIRCADIAN PERIODICITY OF ORGANISM AND ENVIRONMENTAL PERIODICITY
A66-80538

AURUCCI, A.
VARIATIONS OF P-WAVE OF ELECTROCARDIOGRAM IN RELATION TO CHANGES OF BODY POSITION
A66-80713

COURSE OF P-WAVE IN RELATION TO BODY POSITION IN RABBIT - PRESSORECEPTOR EFFECT A66-80714

AUSTIN, R. W.
PREFLIGHT, IN-FLIGHT, AND POSTFLIGHT TESTS OF VISUAL ACUITY AND CAPABILITY OF GEMINI V CREW MEMBERS N66-18011

AVANT, L. L.
LITERATURE REVIEW OF HUMAN REACTIONS TO STRUCTURELESS VISUAL FIELD EXPOSURE
TR-34 N66-16508

AVERYANOV, V. A.
ANIMAL STUDIES ON SUPERSATURATION WITH NITROGEN AND INCREASED BODY RESISTANCE TO DECOMPRESSION SICKNESS N66-17131

TEMPERATURE EFFECTS ON DECOMPRESSION SICKNESS AND AIR EMBOLISM IN ANIMALS N66-17137

B

BABCOCK, S. M.
BONE MINERAL CONTENT IN DOMESTIC HEN MEASURED BY ATTENUATION OF MONOENERGETIC PHOTON BEAM
N66-17675

BAEYENS, W.
PREPARATION, PROPERTIES, AND STORAGE STABILITY OF MACROMOLECULES LABELLED BY TRITIUM AND BY BIOLOGICAL SYNTHESIS - NUCLEIC ACIDS, LYSOZYME, AND RIBONUCLEASE
EUR-2419.F N66-16439

BAINTON, C. R.
POSTHYPERVENTILATION APNEA IN AWAKE MAN
A66-80591

BAKER, D. W.
PHYSIOLOGICAL AND CLINICAL APPLICATIONS OF TRANSCUTANEOUS DOPPLER FLOWMETER APPLYING TRANSDUCER TO SKIN SURFACE OVER STRATEGIC SITES TO INDICATE BLOOD FLOW VELOCITY A66-80604

OPERATIONAL CAPABILITY AND PHYSIOLOGICAL AND CLINICAL APPLICATIONS OF TRANSCUTANEOUS ULTRASONIC BLOOD VELOCITY METER A66-80620

BALAKHOVSKII, I. S.
STUDY OF KIDNEY FUNCTION IN PERSONNEL OF SPACECRAFT **VOSKHOD** AFTER SPACE MISSION
A66-80746

BALDUCCI, L.
INFLUNCE OF MODERATE ALCOHOLEMIC VALUES ON SOME ASPECTS OF PSYCHOMOTOR REACTIVITY
A66-80727

BANCROFT, R. W.
NEUROLOGIC ADAPTATIONS AND AUDIOGENIC RESPONSES IN MICE EXPOSED TO CHRONIC 2 X GRAVITY FIELD, NOTING DEVELOPMENT OF MORE EFFICIENT CIRCULATORY SYSTEM, GROWTH PATTERN ALTERATIONS, ETC
A66-17660

BARBASHOVA, Z. I.
EFFECT OF ADRENALECTOMY ON ADAPTATION TO HYPOXIA IN RATS - CHANGES IN HAEMOGLOBIN CONCENTRATION AND OSMOTIC RESISTANCE OF ERYTHROCYTES IN PERIPHERAL BLOOD A66-80652

BARBER, J. L.
EFFECT OF SAMPLING TECHNIQUE ON DETERMINATION OF ARTERIAL OXYGEN PRESSURE DURING OXYGEN BREATHING IN MAN A66-80595

BARER, A. S.
PHYSIOLOGICAL REACTIONS OF HUMAN BODY TO TRANSVERSE ACCELERATION AND MEANS OF INCREASING RESISTANCE A66-80560

BARNETT, E.
CORTICAL BONE VOLUME AND LUMBAR SPINE DENSITY RELATED TO AGING IN WOMEN - X-RAY MEASUREMENTS OF RELATIVE VERTEBRAL DENSITY N66-17669

BARNETT, S. A.
EFFECTS OF ADAPTATION OF MICE TO COLD ON REPRODUCTION AND GROWTH A66-80521

BARRY, M.
INFLUENCE OF EYE LID MOVEMENT UPON ELECTRO-OCULOGRAPHIC RECORDING OF VERTICAL SACCADIC EYE MOVEMENTS A66-17662

BARTLEY, M. H.
ASH CONCENTRATION, FEMORAL THICKNESS, AND VERTEBRAL MINERALIZATION RELATED TO AGING IN HUMANS N66-17680

BARTORELLI, C.
BEHAVIOR REFLEX REGULATION OF DECORTICATE CAT, NEURAL MECHANISMS RESPONSIBLE FOR DEEP SLEEP, AND REFLEXES IN CIRCULATION REGULATION DURING SLEEP
AFOSR-65-1579 N66-16469

BAXTER, R. C.
TOXICITY INTERACTIONS OF HIGH PRESSURE OXYGEN AND X-RAYS ON DROSOPHILA A66-80732

BECKLAKE, M. R.
VENTILATION, OXYGEN CONSUMPTION, CARDIAC OUTPUT, AND HEART RATE OF ATHLETIC AND NONATHLETIC SUBJECTS EXERCISING AT THREE LEVELS BEFORE AND AFTER TRAINING A66-80607

BECKMAN, D. L.
AGE DEPENDENCE OF RESISTANCE OF CHICKENS TO 100 PERCENT OXYGEN AT ONE ATM / OAP/, NOTING DELAYED MORTALITY IN ADULT BIRDS A66-17458

BEELER, G. W., JR.
CHANGES IN PATTERNS OF HUMAN ELECTROENCEPHALOGRAM DURING FLUCTUATIONS OF PERCEPTION OF STABILIZED RETINAL IMAGE A66-80579

BEGGS, J. C.
EXTRAVEHICULAR MOBILITY UNIT / EMU/ TO BE WORN BY ASTRONAUTS ON APOLLO LUNAR LANDING MISSION A66-18584

BEISCHER, D. E.
EFFECT OF EXTREMES IN MAGNETIC ENVIRONMENT ON PHYSIOLOGICAL BEHAVIOR A66-18585

CONSTRAINT PLATFORM AND BIOTELEMETRY MODULE FOR HUMAN BALLISTOCARDIOGRAM AND ELECTROCARDIOGRAM IN ZERO GRAVITY ENVIRONMENT
NASA-CR-69828 N66-16283

DELAYED SEA URCHIN EGG MITOSIS BY HIGH MAGNETIC FIELD - TESTING METHODS FOR MAGNETIC FIELD-FREE ENVIRONMENT
NASA-CR-70632 N66-18318

BELIAEVA, L. A.
EFFECTS OF VIBRATION, ACCELERATION AND IRRADIATION ON CHROMOSOMES IN MICE A66-80741

BELL, R. A.
RESPONSE LATENCY CHANGES FOLLOWING SIGNAL PITCH SHIFTS, AND ADAPTATION-LEVEL THEORY EVALUATION
TR-36 N66-16510

BELLELLI, L.
THERAPEUTIC USES OF OXYGEN AT HIGH PRESSURE AND PREVENTION OF ITS TOXICITY IN RATS A66-80644

BENADE, A. J. S.
ROLE OF PHYSICAL CONDITIONING IN ACCLIMATIZATION OF HUMAN SUBJECTS WORKING IN HUMID HEAT A66-80612

BENSON, A. J.
INTERACTION OF LINEAR AND ANGULAR ACCELERATIONS ON VESTIBULAR RECEPTORS IN MAN A66-80564

BENSON, R. E.
U SAF WHOLE BODY GAMMA SPECTROMETRY IN SUPPORT OF AIR FORCE AEROSPACE MISSION A66-17664

BERG, B. A.
HEART RATE, VENTILATORY VOLUME, OXYGEN CONSUMPTION AND ENERGY EXPENDITURE OF MEN BEFORE, DURING, AND AFTER CLIMBING A66-80687

BERGER, B. B.
REGENERATIVE WASTE DISPOSAL SYSTEM SUPPLYING PHYSIOLOGICAL REQUIREMENTS FOR HUMANS IN SPACE CRAFT
PB-168787 N66-17429

BERGERON, H. P.
TRACKING STUDY TO DETERMINE MAXIMUM CONTROL ELEMENT LAG AND MAXIMUM AND MINIMUM CONTROL SENSITIVITY TOLERATED IN MANUALLY CONTROLLED COMPENSATORY TRACKING TASK
NASA-TN-D-3242 N66-16548

BERGOFSKY, E. H.
REGIONAL BLOOD FLOW TO BRAIN, INTESTINE, AND HIND LIMB AND TOTAL BLOOD FLOW OF DOG BREATHING PURE OXYGEN A66-80605

BERKLEY, W. J.
SELF-REPORTED SYMPTOM INCIDENCE OF AIR TRAFFIC CONTROL PERSONNEL
AM-65-5 N66-16584

BIOMEDICAL SURVEY OF AIR TRAFFIC CONTROL FACILITIES - RELATIONSHIP OF EXPERIENCE AND AGING TO INCIDENCE OF STRESS SYMPTOMS
AM-65-6 N66-16669

BERKOWITZ, B.
AGING EFFECT ON INTELLIGENCE TEST SCORES A66-80584

BERLUCCHI, G.
BRAIN STEM MECHANISMS ANTAGONISTIC TO RETICULAR ACTIVATING SYSTEM A66-80693

CORRELATION OF ELECTROENCEPHALOGRAM WITH PUPIL AND EYELID BEHAVIOR, VISUAL ACCOMMODATION, AND OCULAR MOVEMENTS DURING SLEEP A66-80701

BERNARDES, C.
CASE HISTORY OF MYOCARDIAL INFARCTION AFTER GASTROINTESTINAL ACUTE HEMORRHAGE IN COMMERCIAL PILOT A66-80571

BERNIER, M.
NEUTRON ACTIVATION AND SCINTILLATION COUNTERS FOR DETECTION OF SODIUM AND POTASSIUM IN BIOLOGICAL MEDIA
CEA-R-2837 N66-17491

BERTET, M.
NEUTRON ACTIVATION AND SCINTILLATION COUNTERS FOR DETECTION OF SODIUM AND POTASSIUM IN BIOLOGICAL MEDIA
CEA-R-2837 N66-17491

BERTUN, P.
REGIONAL BLOOD FLOW TO BRAIN, INTESTINE, AND HIND LIMB AND TOTAL BLOOD FLOW OF DOG BREATHING PURE OXYGEN A66-80605

BEVAN, W.
PERCEPTUAL REFERENCE FRAME EVALUATION, AND PHYSIOLOGICAL RESPONSES TO UNUSUAL ENVIRONMENTS, AUDITORY SIGNALS, STRUCTURELESS VISUAL FIELD EXPOSURE, AND STIMULI
AD-623869 N66-16506

ENVIRONMENT CONCEPT AS PSYCHOLOGICAL FACTOR, AND PERTINENT LITERATURE REVIEW
TR-33 N66-16507

RELATIONAL DETERMINATION OF BEHAVIOR, AND SIGNIFICANT RELATIONSHIPS BETWEEN RESPONSE VARIABLES AND BEHAVIORALLY EFFECTIVE PROPERTIES OF STIMULI
TR-35 N66-16509

RESPONSE LATENCY CHANGES FOLLOWING SIGNAL PITCH SHIFTS, AND ADAPTATION-LEVEL THEORY EVALUATION
TR-36 N66-16510

BEVEGARD, B. S.
CIRCULATORY EFFECTS OF CAROTID ARTERY STRETCH RECEPTORS STIMULATION IN MAN AT REST AND DURING EXERCISE A66-80555

BILLINGHAM, J.
PSYCHOPHYSIOLOGICAL RESPONSES IN HUMANS TO LOW FREQUENCY PRESSURE OSCILLATIONS
NASA-TN-D-3323 N66-18432

BLOK, J.
MILK RADIOACTIVITY DETERMINATION AFTER ATOMIC ATTACK BY GEIGER- MUELLER COUNTING TUBE
MBL/1965/22 N66-17483

BLUNDO, G.
HEMATOPOIETIC CHANGES IN DIFFERENT ANIMALS AFTER X-IRRADIATION AS COMPARED WITH ANALOGOUS CHANGES IN MAN A66-80724

BODERGAT, R.
GAMMA RADIATION EFFECTS ON CHIMAERAS OF FRUIT TREES
EUR-2546.F N66-18070

BODIN, M. A.
INTERACTION OF LINEAR AND ANGULAR ACCELERATIONS ON VESTIBULAR RECEPTORS IN MAN A66-80564

BOGDANOV, R. S.
DETERMINATION OF THRESHOLD EXCITABILITY OF SEMICIRCULAR CANALS WITH THERMAL STIMULATION METHOD IN PIGEONS A66-80738

BOICEFF, T.
ELECTROENCEPHALOGRAMS OF EXPERIENCED PILOTS, PILOT CANDIDATES, AND NON-PILOTS A66-80719

BONVALLET, M.
BULBAR CONTROL OF AROUSAL SYSTEM IN CATS A66-80695

BOOT, S. J.
SLOW NEUTRON CALIBRATION OF FILM AND GAMMA DOSIMETERS
AERE-R-4960 N66-18214

BORDEN, G. J.
REVISION IN CINEMA METHOD IMPROVES GEOGRAPHIC ORIENTATION IN AIRCRAFT PILOTS DURING SIMULATED LOW ALTITUDE FLIGHT
TR-751-5 N66-17587

BOUMAN, M. A.
INCREASE IN THRESHOLD FOR VISUAL PERCEPTION DURING EYE MOVEMENTS AND RETINAL ADAPTATION
AD-624790 N66-17022

BOWIE, D. R.
EQUIPMENT AND PROCEDURE DESCRIPTION FOR AIR SAMPLING BETA RADIATION FALLOUT MEASUREMENTS
RB-65-1 N66-16997

BRASHEAR, R. E.
PULMONARY DIFFUSION AND CAPILLARY BLOOD VOLUME IN DOGS AT REST AND WITH EXERCISE A66-80600

BRAUN, T.
EFFECT OF STARVATION AND PROLONGED EXERCISE ON FATTY ACID COMPOSITION IN ADIPOSE TISSUE AND EFFECT OF ADRENALIN ON COMPOSITION OF FATTY ACIDS RELEASED BY ADIPOSE TISSUE IN VITRO IN RATS A66-80651

EFFECT OF INFANTILE FEEDING RATE ON BODY WEIGHT LOSS, NITROGEN EXCRETION, AND SURVIVAL TIME DURING SUBSEQUENT EXPOSURE TO STARVATION, IN RATS A66-80653

EFFECT OF STARVATION ON FATTY ACID COMPOSITION OF MYOCARDIUM IN RATS A66-80684

BREDELL, G. A. G.
ROLE OF PHYSICAL CONDITIONING IN ACCLIMATIZATION OF HUMAN SUBJECTS WORKING IN HUMID HEAT A66-80612

BRESTKIN, A. P.
PHYSIOLOGICAL RESPONSES IN HUMANS AND ANIMALS TO AIR EMBOLISMS AND PRESSURE ENVIRONMENTS IN DECOMPRESSION SICKNESS STUDIES
NASA-TT-F-358 N66-17126

PERMISSIBLE SUPERSATURATION COEFFICIENT IN HUMANS BREATHING AIR AND OXYGEN-HELIUM MIXTURE IN PRESSURE CHAMBER N66-17127

SUPERSATURATION COEFFICIENT AND DISSOLVED GAS TENSION RELATION IN GAS-LIQUID INTERACTION AT HIGH PRESSURES N66-17128

SUPERSATURATION OF ANIMALS AND HUMANS WITH GASES FOR DECOMPRESSION SICKNESS STUDIES N66-17129

BROHEE, H.
RELATIONS BETWEEN LACTATE PRODUCTION, RESPIRATION, AND NUCLEAR DAMAGE IN IRRADIATED RAT THYMOCYTES
EUR-2623.E N66-18146

BROWN, D.
CEREBRAL CORTEX AND SUBCORTEX RELATIONSHIPS IN CHIMPANZEE DURING SLEEP, WAKEFULNESS, AND RAPID EYE MOVEMENT STATE A66-80704

HUMAN ELECTROENCEPHALOGRAM GENERATOR SPECTRAL ANALYSIS IN POSTERIOR CEREBRAL REGIONS
NASA-CR-57050 N66-18389

BROWN, F. A., JR.
UNIFIED THEORY FOR BIOLOGICAL RHYTHMS - ENVIRONMENTAL PERIODICITIES AS TIMERS ON PLANT AND ANIMAL RHYTHMS A66-80537

BROWN, W. L.
PERSEVERATION LEARNING SET FORMATION TO NON-REWARDED CUES BY NORMAL AND PREVIOUSLY IRRADIATED MONKEYS A66-80585

BRUCE, V. G.
CELL DIVISION RHYTHM AND CIRCADIAN CLOCK IN PLANTS AND ANIMALS A66-80529

BRUDERMAN, I.
CHANGES IN VENTILATION AND PULMONARY MECHANICS INDUCED BY HYPERTONIC SODIUM CHLORIDE IN DOGS A66-80587

BRUNER, H.
NOREPINEPHRINE AND ANGIOTENSIN EFFECTS ON CORONARY FLOW AND MYOCARDIAL OXYGEN CONSUMPTION IN CAT A66-80635

PRINCIPLES AND RELATIONSHIPS TO REGULATIVE PROCESSES IN HUMANS - OXYGEN DEFICIENCY TESTS
NASA-TT-F-9737 N66-16574

BRUSCHKE, G.
SERUM IRON IN ATHLETES AND UNTRAINED SUBJECTS AFTER PHYSICAL EXERCISE A66-80660

BRYAN, M. E.
MAGNITUDE ESTIMATION OF LOUDNESS, COMPARING EXPERIMENTAL RESULTS OF OBSERVERS ESTIMATES TO SONE SCALE A66-17732

BRYTVAN, IA. M.
ROLE OF HIGHER NERVOUS SYSTEM IN MECHANISM OF INTERACTION OF RESPIRATORY AND VASOMOTOR CENTERS DURING DEVELOPMENT OF HEMIC HYPOXIA AND FUNCTIONAL RESTORATION A66-80658

BUCK, A. C.
AMELIORATIVE VALUE OF CARBOHYDRATE AND ELECTROLYTES TO SURVIVAL OF FASTING HUMAN SUBJECTS IN ARCTIC A66-80613

BULLARD, R. W.
NOCTURNAL BODY TEMPERATURE, SWEATING RATE, AND DEPTH OF SLEEP MONITORED BY ELECTRONCEPHALOGRAPHY A66-80610

BULOW, K.
RELATIONSHIP OF PULMONARY VENTILATION AND CARBON DIOXIDE TENSION TO SLEEP AND WAKEFULNESS LEVELS RECORDED BY ELECTROENCEPHALOGRAM IN HUMANS A66-80707

BURNER, A. M.
U SAF WHOLE BODY GAMMA SPECTROMETRY IN SUPPORT OF AIR FORCE AEROSPACE MISSION A66-17664

BUSNENGO, E.
EXPERIMENTS WITH ANESTHESIZED DOGS SUBJECTED TO G ACCELERATIONS, OBSERVING BEHAVIOR OF ARTERIAL OXYGEN SATURATION AND PULMONARY VENTILATION DURING SHORT PERIODS A66-19083

ELECTROCARDIOGRAPHIC STUDY AND COURSE OF ARTERIAL PRESSURE AT VARIOUS BODY POSITIONS ON TILTING TABLE A66-80712

BUSSO, D.
MAXIMAL RESISTANCE DURING ALTITUDE SIMULATION TO ACUTE HYPOXIA IN MICE TREATED WITH CORTISONE, TESTOSTERONE, AND SOMATOTROPIC HORMONE A66-80723

C

CAMERON, J. R.
BONE MINERAL MEASUREMENTS BY PHOTON ABSORPTION WITH IMPROVED SCANNING DEVICE N66-17674

CAPORALE, R.
VISUAL PERCEPTION DURING POST-ROTATORY NYSTAGMUS IN PILOTS A66-80718

CAPUTO, L.
ELECTROENCEPHALOGRAMS OF EXPERIENCED PILOTS, PILOT CANDIDATES, AND NON-PILOTS A66-80719

CAREY, P. M.
VISUAL SIMULATION FOR AIRCRAFT AND SPACE FLIGHT TRAINERS A66-80511

CARPENTER, D. L.
BIOSATELLITE FOR TV MONITORING OF DEVELOPMENT OF OPOSSUM EMBRYONIC FETUS IN SPACE ENVIRONMENT A66-18583

CASCO, E. L.
PRESSURIZED SUITS USED IN WATER IMMERSION STUDIES WHICH SIMULATE ZERO GRAVITY EFFECTS N66-17390

CASPERS, H.
SHIFTS OF CEREBRAL CORTICAL STEADY POTENTIAL DURING SLEEP A66-80698

CASTAGLIUOLO, P.
EVALUATION OF HEARING LOSS AND VESTIBULAR DAMAGE IN PILOTS AND AIR FORCE PERSONNEL A66-80717

CASTORINA, S.
USEFULNESS AND LIMITATIONS OF NELSON TEST METHOD FOR SYPHILIS IN DETERMINING FLIGHT FITNESS IN PILOTS A66-80720

CATALANO, J.
DETECTION IN HOMOGENEOUS VISUAL FIELD UNDER CONDITIONS OF INFINITE DEPTH OF FOCUS A66-80667

CAUSA, L.
EXPERIMENTS WITH RATS UNDER ANESTHESIA SUBJECTED TO ACCELERATION, NOTING ELECTROENCEPHALOGRAMS A66-19085

VARIATIONS OF P-WAVE OF ELECTROCARDIOGRAM IN RELATION TO CHANGES OF BODY POSITION A66-80713

CAVALIERE, R.
THERAPEUTIC USES OF OXYGEN AT HIGH PRESSURE AND PREVENTION OF ITS TOXICITY IN RATS A66-80644

CAVALLARI, J. D.
GALVANIC SKIN RESPONSE, HEART RATE, AND MUSCLE ACTION BIOELECTRIC POTENTIAL SIGNALS AS PSYCHOPHYSIOLOGICAL RESPONSE TO LEARNING TASK DIFFICULTY
NAVTRADEVCEN-IH-34 N66-16639

CHALMERS, J. P.
ROLE OF SYMPATHETIC NERVOUS SYSTEM IN CIRCULATORY RESPONSE TO ARTERIAL HYPOXIA IN RABBITS A66-80643

CHANDLER, H. W.
SOLID ELECTROLYTE CARBON DIOXIDE REDUCTION SYSTEM FOR SUBORBITAL FLIGHT
AMRL-TR-65-153 N66-16643

CHAPPELL, H. R.
AIRCRAFT ACCIDENTS AND DISORIENTATION EXPERIENCES OF ARMY HELICOPTER PILOTS AS RELATED TO TRAINING AND INSTRUMENT DESIGN A66-80563

CHARLES, P.
PREPARATION, PROPERTIES, AND STORAGE STABILITY OF MACROMOLECULES LABELLED BY TRITIUM AND BY BIOLOGICAL SYNTHESIS - NUCLEIC ACIDS, LYSOZYME, AND RIBONUCLEASE
EUR-2419.F N66-16439

CHAUDHURI, S.
PHYSICAL AND CHEMICAL PROPERTIES OF ALPHA-LACTALBUMIN CRYSTALS PREPARED FROM GOAT MILK N66-16363

CHERNIACK, N. S.
ELECTRICAL ACTIVITY OF PHRENIC NERVE FROM RESPIRATORY CENTER OF DOG DURING OBSTRUCTED BREATHING A66-80601

CHERNOVA, G. G.
ROLE OF REFLEXES FROM SINOCAROTID ZONE IN RESPIRATION CONTROL DURING EXCESSIVE INTRAPULMONARY OXYGEN TENSION IN CATS A66-80655

CHISTOVICH, L. A.
GENERAL MODEL OF SPEECH DISCRIMINATION USED TO REFORMULATE MOTOR THEORY OF PERCEPTION
JPRS-34106 N66-16954

CHOWDHURY, J. N.
STRUCTURAL RELATION OF ABNORMAL CALCIFICATIONS WITH COLLAGEN MATRIX IN DISEASED HUMAN BONES - STUDY OF BONE DYSPLASIA BY X-RAY DIFFRACTION N66-16362

CHRISTENSEN, J. M.
HUMAN ENGINEERING AND PERFORMANCE CONSIDERATIONS IN SPACECRAFT DESIGN AND SPACE FLIGHT MISSIONS N66-16429

CHVAPIL, M.
RESISTANCE OF MYOCARDIUM TO ANOXIA IN RATS ACCLIMATIZED TO HIGH ALTITUDE SIMULATION A66-80649

CICALA, A.
THERAPEUTIC USE OF ACETYLASPARTIC ACID-CITRULLINE PREPARATION IN FLIGHT FATIGUE DURING SPORT FLYING A66-80721

CINKOTAI, F. F.
SYNCOPE INDUCED BY APPLICATION OF NEGATIVE PRESSURE TO LOWER BODY AND EFFECT ON LUNG CARBON MONOXIDE DIFFUSING CAPACITY A66-80565

PULMONARY DIFFUSING CAPACITY AND CARDIOVASCULAR RESPONSE IN MAN AS AFFECTED BY APPREHENSION A66-80602

DIURNAL VARIATION IN PULMONARY DIFFUSING CAPACITY OF MAN FOR CARBON MONOXIDE A66-80603

CIOCATTO, E.
THERAPEUTIC USES OF OXYGEN AT HIGH PRESSURE AND PREVENTION OF ITS TOXICITY IN RATS A66-80644

CLARKSON, G. P. E.
THEORY OF GROUP DECISION BEHAVIOR TESTED ON DYADS A66-80637

COCKETT, A. T. K.
DECOMPRESSION SICKNESS OF DOGS AS AFFECTED BY PLASMA REPLACEMENT BY DEXTRAN AND HYPOTHERMIA A66-80668

URINARY BLADDER CALCULI FORMED AT HIGH ALTITUDE IN RATS A66-80670

COHEN, A.
IRRELEVANT INFORMATION EFFECTS ON SHORT-TERM RETENTION OF RELEVANT INFORMATION A66-80583

COHEN, B.
AMPLITUDE OF PHOTICALLY EVOKED POTENTIALS BY CONDITIONED STIMULUS IN CAT A66-80580

COHEN, M. J.
SOFT X-RAY-RADIATION FOR BONE DENSITOMETRY USING GAMMA RADIOISOTOPE SOURCE IN PRECISION X-RAY TUBE N66-17676

COLBERT, C.
COMPARISON OF CORTICAL THICKNESS AND RADIOGRAPHIC MICRODENSITOMETER MEASUREMENTS IN DETERMINING BONE LOSS N66-17672

COLE, J. N.
L F AND INFRASONIC NOISE EFFECTS ON MANS CARDIAC RHYTHM, HEARING, VISION, MOTOR CONTROL, SPATIAL ORIENTATION, SPEECH AND SUBJECTIVE TOLERANCE

A66-17656

COLE, L. J.
HOMOGRAFT RESPONSE AND HEMAGGLUTININ PRODUCTION BY SENSITIZED THYMECTOMIZED IRRADIATED ADULT MICE
USNRDL-TR-920 N66-17065

COLLINS, V. G.
POTENTIAL SOURCES AND METHODS DESCRIPTION FOR SPACE VEHICLE WATER RECOVERY INCLUDING MISSION WEIGHT PENALTIES
NASA-TM-X-56123 N66-17221

CONNORS, M. M.
EFFECT OF WAVELENGTH AND BANDWIDTH OF RED LIGHT ON RECOVERY OF DARK ADAPTATION A66-80678

COOKE, J. P.
NEUROLOGIC ADAPTATIONS AND AUDIOGENIC RESPONSES IN MICE EXPOSED TO CHRONIC 2 X GRAVITY FIELD, NOTING DEVELOPMENT OF MORE EFFICIENT CIRCULATORY SYSTEM, GROWTH PATTERN ALTERATIONS, ETC
A66-17660

CORDEAU, J. P.
THALAMIC TRANSMISSION DURING SLEEP AND WAKEFULNESS IN CATS A66-80705

CORKINDALE, K. G.
PSYCHOLOGY AND DISPLAY SYSTEM DESIGN
A66-80708

CORONA, B. M.
CYCLIC GRIP FOR HELICOPTER CONTROL - HUMAN ENGINEERING DESIGN STUDY N66-16537

CORREALE, J. V.
SPACE SUIT DEVELOPMENT STATUS
NASA-TN-D-3291 N66-16942

CORRENTI, V.
MORPHOLOGICAL CHARACTERISTICS AND FUNCTIONAL DATA IN PILOT TRAINEES, NOTING ANTHROPOMETRIC DATA AND VITAL CAPACITY, OXYGEN INTAKE, HEART RATE, ETC
A66-19084

CORSO, J. F.
PITCH DISCRIMINATION AT HIGH FREQUENCIES BY AIR AND BONE CONDUCTION A66-80663

COUCH, N. P.
ELECTROMETRIC SURFACE PH OF ISCHEMIC KIDNEY AND EFFECT OF HYPOTHERMIA IN DOGS AND RABBITS
A66-80629

COURTS, D. E.
TOLERANCE TO SPINNING IN EJECTION ESCAPE
A66-80561

CRAIG, F. N.
HEART RATE, OXYGEN CONSUMPTION, AND BODY TEMPERATURE AND WEIGHT OF DEHYDRATED SUBJECTS DURING EXERCISE IN HOT ENVIRONMENT
A66-80617

CRESSWELL, A. W.
OXYGEN SYSTEM FOR CREW OF EXECUTIVE JET AIRCRAFT, USING CONTINUOUS FLOW OF OXYGEN, FIXED CAPACITY RESERVIOR, AND PROVIDING SAFETY PRESSURE
FPRC/MEMO-207 N66-18054

FLIGHT CREW OXYGEN EQUIPMENT DEVELOPED FOR VC 10 TRANSPORT AIRCRAFT
FPRC/MEMO-208 N66-18055

CRONKITE, E. P.
AUTORADIOGRAPHIC METHOD USED FOR STUDIES OF GRANULOCYTOPOIESIS IN MAN
BNL-7955 N66-18287

CUGELL, D. W.
MEASURING BLOOD OXYGEN TENSION WITH MICROCATHODE ELECTRODE A66-80622

CUMMINGS, E. G.
HEART RATE, OXYGEN CONSUMPTION, AND BODY TEMPERATURE AND WEIGHT OF DEHYDRATED SUBJECTS DURING EXERCISE IN HOT ENVIRONMENT
A66-80617

CUTT, R. A.
PERFORMANCE OF IMPLANTED ELECTRODE FOR ELECTRO-NYSTAGMOGRAPHY IN SQUIRREL MONKEY
A66-80621

D

DAGIANTI, A.
EXPERIMENTS WITH ANESTHESIZED DOGS SUBJECTED TO G ACCELERATIONS, OBSERVING BEHAVIOR OF ARTERIAL OXYGEN SATURATION AND PULMONARY VENTILATION DURING SHORT PERIODS A66-19083

DALLOW, T. P.
N ASA BIOSATELLITE STUDY OF ORGANISM IN SPACE ENVIRONMENT, WITH EMPHASIS ON WEIGHTLESSNESS AND RADIATION EFFECT A66-17615

DALY, W. J.
PULMONARY DIFFUSION AND CAPILLARY BLOOD VOLUME IN DOGS AT REST AND WITH EXERCISE A66-80600

DAMATO, J.
CYTOPLASMIC ALTERATIONS AND FAT VACUOLE FORMATION IN PNEUMOCYTES OF GUINEA PIGS EXPOSED TO SEVERE HYPOXIA IN LOW PRESSURE CHAMBER
A66-18769

DAS, S.
STRUCTURAL RELATION OF ABNORMAL CALCIFICATIONS WITH COLLAGEN MATRIX IN DISEASED HUMAN BONES - STUDY OF BONE DYSPLASIA BY X-RAY DIFFRACTION
N66-16362

DAVIES, J. M.
INFRARED IMAGE-CONVERTER METHOD OF OBSERVING EYE MOTION IN FLASH BLINDNESS EXPERIMENTS.
A66-80675

DAVILA, C.
PREPARATION, PROPERTIES, AND STORAGE STABILITY OF MACROMOLECULES LABELLED BY TRITIUM AND BY BIOLOGICAL SYNTHESIS - NUCLEIC ACIDS, LYSOZYME, AND RIBONUCLEASE
EUR-2419.F N66-16439

DAVIS, H.
VISUAL AID IN DETECTION, RECOGNITION AND ACQUISITION OF TARGETS AT DIFFERENT ALTITUDES AND SPEEDS A66-17285

DAVYDOV, B. I.
COMBINED EFFECT OF ACCELERATION AND RADIATION ON PHYSIOLOGICAL FUNCTION IN MICE A66-80740

DAWKINS, P. B.
PROGRAMMED INSTRUCTION TO LEARN BASIC OBSERVER SKILLS OF VISUAL SEARCH, TARGET RECOGNITION, GEOGRAPHIC ORIENTATION, AND TARGET LOCATION
N66-16545

DAWSON, C.
BLOOD, PLASMA, AND RED CELL VOLUMES OF YOUNG AND OLD MEN DURING REST AND EXERCISE IN DESERT ENVIRONMENT AND AT HIGH ALTITUDE
A66-80606

DE GROOT, A. P.
VITAMIN CONTENT, NUTRITIONAL VALUE, AND AMINO ACID COMPOSITION OF EGG WHITE AFTER LONG TERM STORAGE AT ROOM TEMPERATURE
R-2089 N66-18072

DELL, P.
BULBAR CONTROL OF AROUSAL SYSTEM IN CATS
A66-80695

DEMIN, IU. S.
EFFECTS OF VIBRATION, ACCELERATION AND IRRADIATION ON CHROMOSOMES IN MICE A66-80741

DENAVIT, M.
RELATION OF DIENCEPHALIC ALTERATIONS TO ELECTROENCEPHALOGRAM CORTICAL ACTIVITY AND SLEEP IN CATS A66-80694

DENNIS, J. A.
SLOW NEUTRON CALIBRATION OF FILM AND GAMMA DOSIMETERS
AERE-R-4960 N66-18214

DERY, D. W.
PHYSIOLOGICAL ENERGY EXPENDITURE FROM DONNING FULL PRESSURE SUIT UNDER SPACE AND TIME LIMITATIONS N66-17394

DICK, J. M.
BONE CALCIUM LEVELS DURING TWO WEEKS OF SIMULATED WEIGHTLESSNESS IN HUMAN SUBJECTS A66-80562

DIETLEIN, L. F.
EFFICACY OF CARDIOVASCULAR CONDITIONING WITH PULSATILE LEG CUFF TECHNIQUE IN DECREASING ORTHOSTATIC HYPOTENSION OF GEMINI V ASTRONAUTS N66-18012

EVALUATION OF PHYSICAL CONDITION OF GEMINI V ASTRONAUTS BY CARDIOVASCULAR SYSTEM RESPONSE TO CALIBRATED WORK LOAD N66-18013

DIETMANN, K.
PRINCIPLES AND RELATIONSHIPS TO REGULATIVE PROCESSES IN HUMANS - OXYGEN DEFICIENCY TESTS
NASA-TT-F-9737 N66-16574

DILL, D. B.
BLOOD, PLASMA, AND RED CELL VOLUMES OF YOUNG AND OLD MEN DURING REST AND EXERCISE IN DESERT ENVIRONMENT AND AT HIGH ALTITUDE A66-80606

DINNERSTEIN, A. J.
ROLE OF KNOWLEDGE IN DISTANCE PERCEPTION ON BINOCULAR OR MONOCULAR BASIS A66-80664

DMOCHOWSKI, J. R.
ELECTROMETRIC SURFACE PH OF ISCHEMIC KIDNEY AND EFFECT OF HYPOTHERMIA IN DOGS AND RABBITS A66-80629

DOBROV, N. N.
COSMIC RADIATION HAZARDS AND EFFECT ON MAN AND ANIMALS IN RELATION TO SOLAR ACTIVITY AND FLIGHT DURATION A66-80519

RADIATION EXPOSURE OF ASTRONAUTS DURING LUNAR MISSIONS A66-80683

DOK MEN, Z.
CONDITIONED RESPONSE BEHAVIOR OF DOGS UNDER ACUTE HYPOXIA N66-17149

DOMMERGUES, P.
GAMMA RADIATION EFFECTS ON CHIMAERAS OF FRUIT TREES
EUR-2546.F N66-18070

DONCHIN, E.
VISUALLY EVOKED CORTICAL RESPONSE CORRELATES OF PERCEPTUAL MASKING AND ENHANCEMENT A66-80578

DOWNES, J. J.
DYNAMIC RESPONSE CHARACTERISTICS OF CHEMOREFLEX ROLE IN VENTILATORY DEPRESSION IN MAN ON ABRUPT ADMINISTRATION OF OXYGEN A66-80594

DRINKWATER, F. J., III
POWERED TRIM CHANGES AFFECTING PILOT DURING SIMULATED LANDING FOR SHORT TAKE OFF AND LANDING AIRCRAFT
NASA-TN-D-3246 N66-16550

DRUCKER, A. J.
PREDICTING PILOT SUCCESS IN FIXED AND ROTARY WING AVIATION TRAINING BY USE OF TEST BATTERIES N66-16543

DUBOIS, A. B.
SITE OF PULMONARY VASOMOTOR ACTIVITY DURING HYPOXIA OR SEROTONIN ADMINISTRATION IN DOGS A66-80554

DUFFY, J. O.
DAY-TO-DAY OPERATIONAL QUALITY CONTROL PROGRAM USED IN THE TRAINING OF ARMY HELICOPTER PILOTS N66-16544

DUNTLEY, S. Q.
PREFLIGHT, IN-FLIGHT, AND POSTFLIGHT TESTS OF VISUAL ACUITY AND CAPABILITY OF GEMINI V CREW MEMBERS N66-18011

DVORAK, J.
COMPUTATIONAL ANALYSIS EMPLOYING DIGITAL COMPUTERS TO EVALUATE HYPOXIC STRESS REACTIONS IN MAN A66-17659

E

EAGEN, J.
MINERAL CONTENT OF BONE CORTEX RELATED TO THICKNESS IN SECOND METACARPAL AS A FUNCTION OF AGE AND SEX N66-17673

EARLEY, L. E.
RENAL BLOOD FLOW AND EXTRACELLULAR VOLUME, RENAL AND CARDIAC EFFECTS ON SODIUM EXCRETION, AND ABNORMAL CIRCULATORY STATE EFFECTS ON CARDIAC RATE AND BLOOD PRESSURE - DOG & HUMAN PHYSIOLOGY
NASA-CR-70316 N66-17072

EDHOLM, O. G.
REVIEW OF STUDIES INVESTIGATING POSSIBLIITY THAT MAN IN HOT CLIMATE MAY ADAPT TO WATER DEPRIVATION A66-80686

EDVARDSSON, K. A.
RADIATION DOSIMETRY OF PERSONNEL AT NUCLEAR FACILITIES
AE-211 N66-18133

EDWARDS, D. K., III
METABOLIC RATES IN PRESSURIZED PRESSURE SUIT, AFFECTING HEAT BALANCE OF SUBJECTS METABOLIC HEAT WITH HEAT REMOVED BY ENVIRONMENTAL CONTROL A66-17657

EDWARDS, R. C.
PHYSICAL AND CHEMICAL PROPERTIES BY SEDIMENTATION AND SPECTRAL ANALYSIS FOR PURIFIED STAPHYLOCOCCAL ENTEROTOXIN B
AD-444380 N66-17644

EGUCHI, T.
EYE MOVEMENTS OF WAKING NORMAL SUBJECTS AND SCHIZOPHRENICS WITH CLOSED EYES A66-80661

EISINGER, R. P.
INFLUENCE OF POSTURE AND DIURNAL RHYTHM ON RENAL EXCRETION OF ACID IN NORMAL MEN AND ADRENALECTOMIZED PATIENTS A66-80632

EL-MARAGHI, N. R. H.
INTERACTION OF DIETARY PROTEIN AND CALCIUM ON GROWTH AND MAINTENANCE OF BONES OF YOUNG, ADULT, AND AGED RATS A66-80711

ENOCH, J. M.
INDICATOR OF RAT*S RETINAL RECEPTOR RESPONSE - HISTOLOGICAL STAINING REACTION A66-80679

ENRIGHT, J. T.
ACCURACY OF GEOPHYSICAL RHYTHMS AND FREQUENCY ANALYSIS A66-80524

SYNCHRONIZATION AND RANGES OF ENTRAINMENT IN CIRCADIAN RHYTHM A66-80527

ERDMAN, H. E.
PHYSIOLOGICAL RESPONSE OF GERM CELLS IN FLOWER BEETLES, TRIBOLIUM CASTANEUM, TO X-RAY IRRADIATION
HW-SA-3747 N66-17833

ERNSTING, J.
OXYGEN SYSTEM FOR CREW OF EXECUTIVE JET AIRCRAFT, USING CONTINUOUS FLOW OF OXYGEN, FIXED CAPACITY RESERVIOR, AND PROVIDING SAFETY PRESSURE

FPRC/MEMO-207 N66-18054

ESKIN, A.
VESTIBULAR SENSITIVITY AND ASSOCIATED LOCOMOTOR RESPONSES OF RATS IN ROTATING ENVIRONMENT
NASA-CR-70394 N66-17271

EVARTS, E. V.
NEURONAL ACTIVITY IN VISUAL AND MOTOR CORTEX DURING SLEEP AND WAKING IN MAMMALS
A66-80697

F

FABRY, P.
EFFECT OF INFANTILE FEEDING RATE ON BODY WEIGHT LOSS, NITROGEN EXCRETION, AND SURVIVAL TIME DURING SUBSEQUENT EXPOSURE TO STARVATION, IN RATS
A66-80653

FAIRWEATHER, S. H.
BIOSATELLITE FOR TV MONITORING OF DEVELOPMENT OF OPOSSUM EMBRYONIC FETUS IN SPACE ENVIRONMENT
A66-18583

ZERO-GRAVITY EFFECT ON OPOSSUM FETUS OBSERVED BY TV SYSTEM IN PROPOSED SATELLITE
A66-18726

FAITELBERH-BLANK, V. R.
EFFECT OF HIGH-FREQUENCY VIBRATIONS ON ABSORPTION OF RADIOACTIVE PHOSPHORUS IN INTESTINE, IN DOGS
A66-80744

FAITELBERH, R. O.
ABSORPTIVE CAPACITY OF INTESTINE AND STOMACH DURING WATER DEPRIVATION AND STARVATION IN DOGS
A66-80657

FALCHUK, K. H.
VENTILATORY RESPONSE TO HYPOXIA AND CARBON DIOXIDE FOLLOWING CARBON DIOXIDE EXPOSURE AND SODIUM BICARBONATE INGESTION IN MAN A66-80588

MECHANICAL AND CHEMICAL VENTILATORY STIMULUS INTERACTION AT LOW AND HIGH ALTITUDES IN MAN.
A66-80589

FARNER, D. S.
CIRCADIAN SYSTEMS OF METABOLISM AND TESTICULAR RESPONSE IN PHOTOPERIODIC RESPONSES IN VERTEBRATES A66-80542

FEDDERSEN, W. E.
PSYCHOPHYSIOLOGICAL RESPONSES IN HUMANS TO LOW FREQUENCY PRESSURE OSCILLATIONS
NASA-TN-D-3323 N66-18432

FELIG, P.
RATS EXPOSED TO SPACE CABIN ATMOSPHERE FOR TWO WEEKS, NOTING MORTALITY RATE, ORGANISM FUNCTIONING, GROWTH RATE, ETC A66-17663

FENDER, D. H.
CHANGES IN PATTERNS OF HUMAN ELECTROENCEPHALOGRAM DURING FLUCTUATIONS OF PERCEPTION OF STABILIZED RETINAL IMAGE A66-80579

FENN, W. O.
TOXICITY INTERACTIONS OF HIGH PRESSURE OXYGEN AND X-RAYS ON DROSOPHILA A66-80732

FERRELL, W. R.
REMOTE MANIPULATION TASK PERFORMANCE AS AFFECTED BY TRANSMISSION DELAY A66-80513

FUNCTIONAL EXTENSION OF HUMAN HANDS THROUGH REMOTE CONTROL MACHINE
NASA-CR-69856 N66-16394

FEUTZ, E.
COMPARISON OF CORTICAL THICKNESS AND RADIOGRAPHIC MICRODENSITOMETER MEASUREMENTS IN DETERMINING BONE LOSS N66-17672

FILSAKOVA, B.
COMPUTATIONAL ANALYSIS EMPLOYING DIGITAL COMPUTERS TO EVALUATE HYPOXIC STRESS REACTIONS IN MAN
A66-17659

FINLEY, F. R.
MYOELECTRIC POTENTIAL RESPONSE AND FORCE OF MUSCLE CONTRACTION
REPT.-2386 N66-16308

FIORENTINI, A.
TEMPORAL FACTORS IN PATTERN VISION
A66-80551

FISH, J.
SEAT BELT INJURIES IN AIRCRAFT ACCIDENTS - CASE HISTORIES FOR EVIDENCE OF SYNDROME
A66-80633

FISHMAN, A. P.
ELECTRICAL ACTIVITY OF PHRENIC NERVE FROM RESPIRATORY CENTER OF DOG DURING OBSTRUCTED BREATHING A66-80601

FLATH, R. E.
RELATIONSHIP OF AIR FLOW TO ESOPHAGEAL PRESSURE DURING MAXIMAL RESPIRATORY EFFORT IN MAN
A66-80596

FLETCHER, G.
EFFECT OF SAMPLING TECHNIQUE ON DETERMINATION OF ARTERIAL OXYGEN PRESSURE DURING OXYGEN BREATHING IN MAN A66-80595

FLIEDNER, T. M.
AUTORADIOGRAPHIC METHOD USED FOR STUDIES OF GRANULOCYTOPOIESIS IN MAN
BNL-7955 N66-18287

FONTANESI, S.
EXPERIMENTS WITH ANTIHYPEROXIC PHARMACOPROTECTION IN RATS A66-80715

FOSTER, J. F.
LIFE SUPPORT CLOSED CYCLES FOR MISSIONS TO OUTER SPACE LASTING 12 MONTHS OR LONGER, CONSIDERING RECOVERY AND REPLENISHING OF WATER, FOOD AND OXYGEN FROM WASTES A66-17229

FRANK, G. M.
COSMIC RADIATION HAZARDS AND EFFECT ON MAN AND ANIMALS IN RELATION TO SOLAR ACTIVITY AND FLIGHT DURATION A66-80519

FREED, J. J.
VIBRATING MIRROR FLYING SPOT ULTRAVIOLET MICROSCOPE WITH INCORPORATED TELEVISION SYSTEM - ULTRAVIOLET RADIATION EFFECTS ON CELL STRUCTURE AND BEHAVIOR
TID-21611 N66-17985

FREEMAN, G.
COVERT PATHOGENESIS OF NITROGEN DIOXIDE INDUCED EMPHYSEMA IN RATS A66-80669

FREGLY, A. R.
EFFECTS OF STREPTOMYCIN SULFATE IN TREATMENT OF ENDOLYMPHATIC HYDROPS - MENIERES DISEASE
NASA-CR-69862 N66-16446

FRENCH, B. O.
PSYCHOPHYSIOLOGICAL RESPONSES IN HUMANS TO LOW FREQUENCY PRESSURE OSCILLATIONS
NASA-TN-D-3323 N66-18432

FROLOVA, L. I.
ABSORPTIVE CAPACITY OF INTESTINE AND STOMACH DURING WATER DEPRIVATION AND STARVATION IN DOGS
A66-80657

FROMMER, J. C.
TRANSDUCER FOR RECORDING INSTANTANEOUS RESPIRATORY WAVEFORMS IN ANIMALS AND MAN A66-80624

FU, K.-S.
STOCHASTIC AUTOMATIC MODELS FOR SYNTHESIS OF LEARNING SYSTEMS
TR-EE65-17 N66-17615

FURIOSI, N. J.
COVERT PATHOGENESIS OF NITROGEN DIOXIDE INDUCED EMPHYSEMA IN RATS A66-80669

G

GALUNOV, V. I.
GENERAL MODEL OF SPEECH DISCRIMINATION USED TO REFORMULATE MOTOR THEORY OF PERCEPTION
JPRS-34106 N66-16954

GARDEN, J. W.
PLASMA AND SWEAT HISTAMINE CONCENTRATIONS OF HUMAN SUBJECTS AFTER HEAT EXPOSURE AND PHYSICAL EXERCISE A66-80611

TIME FOR ACCLIMATIZATION OF HEALTHY YOUNG EXERCISING MEN TO HOT, WET ENVIRONMENT A66-80616

GARN, S. M.
COMPARISON OF CORTICAL THICKNESS AND RADIOGRAPHIC MICRODENSITOMETER MEASUREMENTS IN DETERMINING BONE LOSS N66-17672

AGE ASSOCIATED BONE LOSS MEASUREMENTS IN HANDS OF THREE RACES N66-17685

GARNIER, A.
EVALUATION OF INTERNAL RADIATION DOSES - EFFECTIVE ENERGY OF ABSORBED RADIONUCLIDES AS FUNCTION OF HUMAN AGE
CEA-R-2809 N66-16222

GARRETT, G. F.
RENAL CHANGES ASSOCIATED WITH ACCLIMATIZATION TO HIGH ALTITUDE IN RATS A66-80553

GAUDE, G.
NEUTRON ACTIVATION AND SCINTILLATION COUNTERS FOR DETECTION OF SODIUM AND POTASSIUM IN BIOLOGICAL MEDIA
CEA-R-2837 N66-17491

GAVRILINA, L. I.
EFFECTS OF VIBRATION, ACCELERATION AND IRRADIATION ON CHROMOSOMES IN MICE A66-80741

GERVINSKI, J. M.
COMPUTER PROGRAM TO SIMULATE SECOND ORDER SERVO SYSTEM DYNAMICS UNDER AUTOMATIC AND MANUAL CONTROL
NASA-CR-70340 N66-17082

GESCHICKTER, E. H.
NOCTURNAL BODY TEMPERATURE, SWEATING RATE, AND DEPTH OF SLEEP MONITORED BY ELECTRONCEPHALOGRAPHY A66-80610

GETZKIN, A. J.
SYSTEM COSTS AND PHARMACOLOGICAL TECHNIQUES AS FUNCTION OF EXERCISE PROGRAM DESIGNED TO MAINTAIN SPACE CREW PHYSICAL FITNESS A66-17658

GHOSAL, S. P.
STRUCTURAL RELATION OF ABNORMAL CALCIFICATIONS WITH COLLAGEN MATRIX IN DISEASED HUMAN BONES - STUDY OF BONE DYSPLASIA BY X-RAY DIFFRACTION N66-16362

GILLOT, J.
GAMMA RADIATION EFFECTS ON CHIMAERAS OF FRUIT TREES
EUR-2546.F N66-18070

GILSON, A. J.
SOFT X-RAY-RADIATION FOR BONE DENSITOMETRY USING GAMMA RADIOISOTOPE SOURCE IN PRECISION X-RAY TUBE N66-17676

GILSON, J. S.
BASIC PATTERNS AND VARIATIONS IN ELECTROCARDIOGRAPHIC RECORDS OF 37 SUBJECTS DURING NORMAL ACTIVITY OVER FOUR YEAR PERIOD A66-80627

GITELZON, I. I.
MATHEMATICAL DESCRIPTION OF CONTINUOUS CULTURING OF MICROALGAE
JPRS-33831 N66-16315

GODIN, Y.
BIOCHEMISTRY DURING SLEEP AND WAKEFULNESS - REVIEW OF EXPERIMENTS IN BRAIN METABOLISM A66-80689

GOEL, N. S.
ONE-DIMENSIONAL ISING MODEL TO EXPLAIN MELTING TEMPERATURE LINEAR DEPENDENCE OF COPOLYMERIC D NA
BN-425 N66-17005

GOLDSTONE, B. W.
OXYGEN CONSUMPTION AND SERUM LIPID LEVELS OF BABOON, PAPIO URSINUS, GIVEN SATURATED AND POLYUNSATURATED FAT DIETS A66-80710

GOLOV, G. A.
PHYSIOLOGICAL REACTIONS OF HUMAN BODY TO TRANSVERSE ACCELERATION AND MEANS OF INCREASING RESISTANCE A66-80560

GOLOVKINA, A. V.
EFFECTS OF VIBRATION, ACCELERATION AND IRRADIATION ON CHROMOSOMES IN MICE A66-80741

GONSER, U.
MOSSBAUER EFFECT IN FE57 STUDYING HEMOGLOBIN, OXYHEMOGLOBIN, CARBOHEMOGLOBIN, CARBOXYHEMOGLOBIN, HEMIN, AND HEME OF HUMAN AND RAT BLOOD A66-80646

GOODMAN, J. R.
PORTABLE LIFE SUPPORT SYSTEM AND PRESSURIZED SUIT FOR EXTRAVEHICULAR MOBILITY UNIT TO PROTECT MAN AGAINST LUNAR SURFACE AND FREE SPACE HAZARDS N66-17387

GRAHAM, B.
ULTRASONIC METHODS TO MEASURE BONE MASSES AND OTHER TISSUES IN SITU N66-17679

GRAHAM, G. M.
MAN-MACHINE CONFLICT IN HIGH PERFORMANCE TACTICAL FIGHTER A66-17282

GRAMENITSKII, P. M.
SUPERSATURATION OF ANIMALS AND HUMANS WITH GASES FOR DECOMPRESSION SICKNESS STUDIES N66-17129

DECOMPRESSION SICKNESS PROVOCATION BY EXPOSING ANIMALS TO HIGH ALTITUDE PRESSURE AFTER DECOMPRESSION N66-17132

DECOMPRESSION AIR EMBOLIC PROCESS IN ANIMALS AND PHYSIOLOGICAL RESPONSES N66-17133

PHYSIOLOGICAL RESPONSES IN RABBITS TO ARTIFICIAL EMBOLISM DUE TO INJECTIONS OF CARBON DIOXIDE, OXYGEN, AIR, AND HELIUM-OXYGEN MIXTURE N66-17134

INCREASED TOLERANCE TO AIR EMBOLISM IN ANIMALS BY REPEATED INJECTIONS N66-17135

ARTIFICIAL AIR EMBOLISM AND DECOMPRESSION EFFECTS ON BLOOD OF DOGS N66-17136

CIRCULATORY AND RESPIRATORY REACTIONS IN DOGS TO DECOMPRESSION AND ARTIFICIAL AIR EMBOLISM N66-17138

RESPIRATORY AND CIRCULATORY CHANGES IN DOGS DURING HIGH PRESSURE OXYGEN TOXICITY N66-17140

GRANT, R. W.
MOSSBAUER EFFECT IN FE57 STUDYING HEMOGLOBIN, OXYHEMOGLOBIN, CARBOHEMOGLOBIN, CARBOXYHEMOGLOBIN, HEMIN, AND HEME OF HUMAN AND RAT BLOOD A66-80646

GRANTHAN, S. A.
HIGH FREE-FALL INJURIES - ANALYSIS OF FIFTY-THREE CASES A66-80634

GRAY, T. H.
MISSION, PERSONNEL, AND HARDWARE DEMANDS OF LOW ALTITUDE NAVIGATION N66-16541

GRAYBIEL, A.
HUMAN CENTRIFUGE STUDIES OF RELATIVE EFFECTIVENESS OF ANTIMOTION SICKNESS DRUGS, INCLUDING HYOSCINE D-AMPHETAMINE, MECLIZINE, CHLORPROMAZINE, THIETHYLPERAZINE, PROCHLORPERAZINE, AND TRIMETHOBENZAMIDE
A66-80573

PSYCHOLOGICAL AND PHYSIOLOGICAL TESTING IN SUCCESS PREDICTION IN FLIGHT TRAINING PROGRAMS
NASA-CR-69895
N66-16192

EFFECTS OF STREPTOMYCIN SULFATE IN TREATMENT OF ENDOLYMPHATIC HYDROPS - MENIERES DISEASE
NASA-CR-69862
N66-16446

PHYSIOLOGICAL RESPONSES TO ANTIMOTION SICKNESS DRUGS - ANTIHISTAMINES, BELLADONNAS, AND PHENOTHIAZINES
NASA-CR-70175
N66-16971

EFFECT OF PROLONGED WEIGHTLESSNESS ON OTOLITH FUNCTION AND HORIZONTALITY MEASUREMENTS IN ABSENCE OF GRAVITY AND VISUAL CUES
N66-18015

GREEN, R. F.
AGING EFFECT ON INTELLIGENCE TEST SCORES
A66-80584

GRETHER, W. F.
HUMAN PERFORMANCE CAPABILITIES IN SPACE BASED ON LABORATORY AND SPACEFLIGHT RESEARCH
A66-18581

GROSHIKOV, M. A.
PATHOLOGICAL CHARACTERISTICS AND MECHANISM OF PULMONARY INVOLVEMENT IN HIGH PRESSURE OXYGEN TOXICITY IN GUINEA PIGS AND DOGS
N66-17141

GRUBER, H. E.
ROLE OF KNOWLEDGE IN DISTANCE PERCEPTION ON BINOCULAR OR MONOCULAR BASIS
A66-80664

GUBISCH, R. W.
GLAREMITS MEASUREMENT BY CONE THRESHOLDS AND BY BLEACHING OF CONE PIGMENTS
A66-80677

GUEDRY, F. E., JR.
VALIDITY OF BRIEF VESTIBULAR DISORIENTATION TEST IN SCREENING PILOT TRAINEES
A66-80559

VALIDITY OF BRIEF VESTIBULAR DISORIENTATION TEST IN SCREENING PILOT TRAINEES
NASA-CR-70146
N66-16603

VESTIBULAR DISORIENTATION TEST VALIDITY IN SCREENING PILOT TRAINEES
NASA-CR-70306
N66-17079

GUILD, E.
L F AND INFRASONIC NOISE EFFECTS ON MANS CARDIAC RHYTHM, HEARING, VISION, MOTOR CONTROL, SPATIAL ORIENTATION, SPEECH AND SUBJECTIVE TOLERANCE
A66-17656

GUSINSKII, Z. S.
RECOMPRESSION TREATMENT OF INTRAPULMONARY PRESSURE TRAUMA
N66-17160

TREATMENT OF SEVERE SPINAL FORM OF DECOMPRESSION SICKNESS
N66-17161

GUYATT, A. R.
PULMONARY DIFFUSING CAPACITY AND CARDIOVASCULAR RESPONSE IN MAN AS AFFECTED BY APPREHENSION
A66-80602

GUZMAN, C. A.
VENTILATION, OXYGEN CONSUMPTION, CARDIAC OUTPUT, AND HEART RATE OF ATHLETIC AND NONATHLETIC SUBJECTS EXERCISING AT THREE LEVELS BEFORE AND AFTER TRAINING
A66-80607

H

HAASE, H.
HYPOXEMIA EFFECT ON CORONARY CIRCULATION AND HEART MUSCLE METABOLISM
A66-80729

HAGEN, C. A.
BACILLUS SPORE GERMINATION IN SIMULATED MARTIAN ENVIRONMENT
NASA-CR-70524
N66-18088

HAINES, R. F.
EFFECTS OF HIGH LUMINANCE SOURCES UPON VISIBILITY OF POINT SOURCES
NASA-TM-X-56561
N66-18332

HALBERG, F.
SOME ASPECTS OF BIOLOGICAL DATA ANALYSIS - LONGITUDINAL AND TRANSVERSE PROFILES OF RHYTHMS
A66-80528

HALL, F. G.
BLOOD, PLASMA, AND RED CELL VOLUMES OF YOUNG AND OLD MEN DURING REST AND EXERCISE IN DESERT ENVIRONMENT AND AT HIGH ALTITUDE
A66-80606

HALL, K. D.
BLOOD, PLASMA, AND RED CELL VOLUMES OF YOUNG AND OLD MEN DURING REST AND EXERCISE IN DESERT ENVIRONMENT AND AT HIGH ALTITUDE
A66-80606

HALMIOVA, O.
VIGILANCE PERFORMANCE OF MEN WITH DIFFERENT TYPES OF CENTRAL NERVOUS SYSTEM
A66-80734

HAMMER, C. H.
EFFECTS OF CONSPICUITY CODING ON TIME REQUIRED AND ERRORS MADE IN LOCATING UPDATED INFORMATION ON INDIVIDUAL AND GROUP COMMAND SYSTEM DISPLAYS
N66-16527

HAMNER, K. C.
RELATIONSHIP BETWEEN PLANT PHOTOPERIODICITY AND CIRCADIAN RHYTHM
A66-80541

HAMNER, W. M.
CIRCADIAN RHYTHM CONTROL OF VERNAL TESTICULAR RESPONSE IN HOUSE FINCH, CAPRODACUS MEXICANUS
A66-80545

HANFF, G. E.
PRESSURIZED SPACE SUIT EFFECTS ON HUMAN PERFORMANCE IN FRICTIONLESS ENVIRONMENT
N66-17392

HANKS, N. J.
TRAINING AND SELECTION PROCEDURES USED AT USAF AEROSPACE RESEARCH PILOT SCHOOL
A66-18579

HARRINGTON, T. J.
METABOLIC RATES IN PRESSURIZED PRESSURE SUIT, AFFECTING HEAT BALANCE OF SUBJECTS METABOLIC HEAT WITH HEAT REMOVED BY ENVIRONMENTAL CONTROL
A66-17657

HARRIS, J. L.
PREFLIGHT, IN-FLIGHT, AND POSTFLIGHT TESTS OF VISUAL ACUITY AND CAPABILITY OF GEMINI V CREW MEMBERS
N66-18011

HARRISON, T. S.
RELATIVE EFFECT OF HYPOXIA AND HYPERCAPNIA ON ADRENAL MEDULLARY SECRETION IN ANESTHETIZED DOGS
A66-80640

HASBROOK, A. H.
SHOULDER SLOPE ANGLE OF FLYING PERSONNEL FOR IMPROVED SHOULDER HARNESS
AM-65-14
N66-17297

HASSELBARTH, H.
SERUM IRON IN ATHLETES AND UNTRAINED SUBJECTS AFTER PHYSICAL EXERCISE
A66-80660

HASTINGS, J. W.
MOLECULAR ASPECTS OF CIRCADIAN SYSTEMS IN MITOSIS AND PHOTOSYNTHESIS IN MICROORGANISMS
A66-80531

HAUSNER, H. H.
HEALTH HAZARDS IN HANDLING AND PROCESSING BERYLLIUM AND ITS COMPOUNDS, NOTING EFFECT ON

LUNGS AND REVIEWING AEC RECOMMENDATIONS
A66-18854

HAUTY, G. T.
PHASE SHIFTING OF HUMAN CIRCADIAN SYSTEM DURING TRANSCONTINENTAL JET FLIGHTS
A66-80547

SELF-REPORTED SYMPTOM INCIDENCE OF AIR TRAFFIC CONTROL PERSONNEL
AM-65-5
N66-16584

BIOMEDICAL SURVEY OF AIR TRAFFIC CONTROL FACILITIES - RELATIONSHIP OF EXPERIENCE AND AGING TO INCIDENCE OF STRESS SYMPTOMS
AM-65-6
N66-16669

HAWKINS, C. K.
UNCERTAINTY, IMPORTANCE, AND AROUSAL AS DETERMINANTS OF PRE-DECISIONAL INFORMATION SEARCH
A66-80747

HAYDON, G. B.
COVERT PATHOGENESIS OF NITROGEN DIOXIDE INDUCED EMPHYSEMA IN RATS
A66-80669

HAYTHORN, W. W.
INTERPERSONAL EXCHANGE IN ISOLATION
A66-80641

HEINRICH, M. R.
ANOMERIC SPECIFICITY OF YEAST GALACTOKINASE BY CHROMATOGRAPHIC METHODS
NASA-TM-X-56057
N66-17218

HELLENDOORN, E. M.
VITAMIN CONTENT, NUTRITIONAL VALUE, AND AMINO ACID COMPOSITION OF EGG WHITE AFTER LONG TERM STORAGE AT ROOM TEMPERATURE
R-2089
N66-18072

HELSON, H.
PERCEPTUAL REFERENCE FRAME EVALUATION, AND PHYSIOLOGICAL RESPONSES TO UNUSUAL ENVIRONMENTS, AUDITORY SIGNALS, STRUCTURELESS VISUAL FIELD EXPOSURE, AND STIMULI
AD-623869
N66-16506

HENDLER, E.
PHYSIOLOGICAL ENERGY EXPENDITURE FROM DONNING FULL PRESSURE SUIT UNDER SPACE AND TIME LIMITATIONS
N66-17394

HERNANDEZ-PEON, R.
EFFECT OF ACETYLCHOLINE, ESERINE, ATROPINE, AND CARBACHOL ON SLEEP INDUCTION PATH IN BRAIN IN CATS
A66-80692

HERRMANN, H.
SERUM IRON IN ATHLETES AND UNTRAINED SUBJECTS AFTER PHYSICAL EXERCISE
A66-80660

HESSER, M. E.
CIRCADIAN CYCLE OF URINARY HYDROCORTISONE IN HEALTHY SUBJECTS AND PATIENTS WITH CUSHING*S SYNDROME
A66-80733

HEUSNER, A.
CONSIDERATION OF ERRORS IN STUDY OF CIRCADIAN RHYTHMS IN ENERGY METABOLISM
A66-80515

HEYMAN, A.
PROTECTIVE EFFECT OF HYPERBARIC OXYGENATION IN CEREBRAL ANOXIA IN DOGS
A66-80556

HIATT, E. P.
EXPERIMENT TO DETERMINE CHICKEN REACTION TO 100 PERCENT OXYGEN AT ATMOSPHERIC PRESSURE
NASA-CR-60380
N66-18391

HIXSON, W. C.
CONSTRAINT PLATFORM AND BIOTELEMETRY MODULE FOR HUMAN BALLISTOCARDIOGRAM AND ELECTROCARDIOGRAM IN ZERO GRAVITY ENVIRONMENT
NASA-CR-69828
N66-16283

HOFFMANN, K.
OVERT CIRCADIAN FREQUENCIES AND CIRCADIAN RULE
A66-80525

CLOCK MECHANISMS IN CELESTIAL ORIENTATION OF ANIMALS
A66-80549

HOLLAND, R. A. B.
CELL AND SOLUTION VELOCITY CONSTANTS FOR REACTION TO FORM CARBOXYHEMOGLOBIN AT DIFFERENT TEMPERATURES RED BLOOD CELL SIZE
A66-80557

HOLMES-SIEDLE, A. G.
EXTRATERRESTRIAL LIFE DETECTION AND LIFE SUPPORT SYSTEMS IN MANNED SPACE TRAVEL, NOTING ELECTRONIC EQUIPMENT NECESSARY FOR IT
A66-18727

HONDA, Y.
OXYGEN PRESSURE VENTILATION RESPONSE CURVE WITH NORMAL HYDROGEN ION CONCENTRATION AND CARBON DIOXIDE PRESSURE IN DOGS
A66-80592

HOPPS, H. N.
HELICOPTER RECONNAISSANCE TACTICS FOR AIR CAVALRY UNITS DURING WINTER ENVIRONMENT
N66-16531

HORAK, J.
COMPUTATIONAL ANALYSIS EMPLOYING DIGITAL COMPUTERS TO EVALUATE HYPOXIC STRESS REACTIONS IN MAN
A66-17659

HORGAN, J. D.
DIGITAL COMPUTER SIMULATION OF RESPIRATORY RESPONSE TO CEREBROSPINAL FLUID CARBON DIOXIDE TENSION OF CAT
A66-80648

HORTOBAGYI, T.
ALGAE GROWTH EXPERIMENTS AND APPLICATIONS - SPACE FLIGHT NUTRITION, FOOD, AND AGRICULTURE
JPRS-34012
N66-16499

HOSLI, L.
NEUROHUMORAL SLEEP TRANSMISSION IN RABBIT
A66-80690

HOWARD, S. M.
ANOMERIC SPECIFICITY OF YEAST GALACTOKINASE BY CHROMATOGRAPHIC METHODS
NASA-TM-X-56057
N66-17218

HUART, R.
PREPARATION, PROPERTIES, AND STORAGE STABILITY OF MACROMOLECULES LABELLED BY TRITIUM AND BY BIOLOGICAL SYNTHESIS - NUCLEIC ACIDS, LYSOZYME, AND RIBONUCLEASE
EUR-2419.F
N66-16439

HUGUENIN, M. H. J.
MILK RADIOACTIVITY DETERMINATION AFTER ATOMIC ATTACK BY GEIGER- MUELLER COUNTING TUBE
MBL/1965/22
N66-17483

HULL, E. I.
AGE ASSOCIATED BONE LOSS MEASUREMENTS IN HANDS OF THREE RACES
N66-17685

HULSE, E. V.
BIOLOGICAL HAZARDS OF RADIATIONS IN SPACE AND CHEMICAL PROTECTION AND METHODS OF TREATMENT
A66-80520

HUTCHINS, C. W., JR.
PREDICTION FORMULAE FOR PERSONNEL SELECTION BASED ON PROCUREMENT SOURCE AND SUCCESS OF OFFICER FLIGHT STUDENTS
AD-623826
N66-16503

HYATT, R. E.
RELATIONSHIP OF AIR FLOW TO ESOPHAGEAL PRESSURE DURING MAXIMAL RESPIRATORY EFFORT IN MAN
A66-80596

I

IAMPIETRO, P. F.
EFFECT OF PROLONGED COLD AND STARVATION, AND SUBSEQUENT REFEEDING ON PLASMA LIPIDS AND GLUCOSE IN NORMAL MAN
A66-80630

IGARASHI, M.
VESTIBULAR SENSITIVITY AND ASSOCIATED LOCOMOTOR

RESPONSES OF RATS IN ROTATING ENVIRONMENT
NASA-CR-70394 N66-17271

ARCHITECTURE AND STRUCTURE OF OTOLITH END ORGAN
NASA-CR-70393 N66-17272

IKEDA, M.
TEMPORAL SUMMATION OF POSITIVE AND NEGATIVE FLASHES IN VISUAL SYSTEM AND INHIBITION BY DOUBLE POSITIVE OR DOUBLE NEGATIVE FLASHES A66-80577

INGRAM, W. M.
REGENERATIVE WASTE DISPOSAL SYSTEM SUPPLYING PHYSIOLOGICAL REQUIREMENTS FOR HUMANS IN SPACE CRAFT
PB-168787 N66-17429

INGVAR, D. H.
RELATION OF ELECTROENCEPHALOGRAM TO BRAIN CORTEX METABOLISM IN MAMMALS A66-80691

IRELAND, P. E.
SUPPRESSION OF MOTION SICKNESS BY THIETHYLPERAZINE A66-80570

ISBISTER, J. P.
ROLE OF SYMPATHETIC NERVOUS SYSTEM IN CIRCULATORY RESPONSE TO ARTERIAL HYPOXIA IN RABBITS A66-80643

ISMAIL, A. H.
NOMOGRAM BY ASTRAND AND RYHMING AS PREDICTOR OF MAXIMUM OXYGEN INTAKE IN MAN DURING SUBMAXIMAL EXERCISE A66-80599

ITALIANO, P.
VERTEBRAL COLUMN INJURY DURING AIRCRAFT ACCIDENTS - CASE HISTORY A66-80722

IVANOV-MUROMSKIY, K.
SELF REGULATION AND MEMORY LOCATION IN HUMAN BRAIN
JPRS-33898 N66-16258

IVANOVICH, P.
ULTRASONIC METHODS TO MEASURE BONE MASSES AND OTHER TISSUES IN SITU N66-17679

J

JACKSON, F.
LIFE ON MARS - CONDITIONS, POSSIBLE TYPES OF ORGANISMS AND THEORIES OF ADVANCED FORMS OF LIFE A66-80582

JACOBS, E. E.
ENZYME SUBSTRATE - RNA-RIBONUCLEASE AND SUCCINATE-CYTOCHROME C REDUCTASE - REACTIONS IN HIGH MAGNETIC FIELDS A66-80645

JANDOVA, A.
EFFECT OF INFANTILE FEEDING RATE ON BODY WEIGHT LOSS, NITROGEN EXCRETION, AND SURVIVAL TIME DURING SUBSEQUENT EXPOSURE TO STARVATION, IN RATS A66-80653

JAY, B.
TWO YEARS OPERATIONAL EXPERIENCE OF TITAN II ICBM MEDICAL SUPPORT PERSONNEL IN PREVENTING ACCIDENTS FROM OPERATIONAL HAZARDS A66-80567

JEANTHEAU, G. G.
SYSTEMS ANALYSIS NAVY ANTIAIRCRAFT WARFARE TRAINING PROGRAM
NAVTRADEVCEN-1574-1 N66-16640

JENKINS, D. W.
N ASA BIOSATELLITE STUDY OF ORGANISM IN SPACE ENVIRONMENT, WITH EMPHASIS ON WEIGHTLESSNESS AND RADIATION EFFECT A66-17615

DETERMINING THICKNESS AND MINERAL CONTENT IN VERTEBRA AND OTHER BONES BY X-RAY AND OTHER DENSITOMETRY - APPLICATION OF TECHNIQUES TO HUMAN STUDIES
NASA-SP-64 N66-17666

JOHANSEN, S. H.
EFFECT OF DECAMETHONIUM ON HEAD LIFT, HAND GRIP, AND RESPIRATORY MUSCLE POWER IN MAN A66-80598

JOHNSON, F.
SLEEP DEPRIVATION AND MICROSLEEP RESPONSES IN RAT A66-80522

JOHNSON, H. D.
HEAT, FOOD INTAKE, AND AGING EFFECTS ON THYROID FUNCTION OF MALE RATS A66-80619

JOHNSON, L. B.
MEMORY SPAN WITH EFFICIENT CODING PROCEDURES IN HUMANS A66-80665

JOHNSON, W. H.
SUPPRESSION OF MOTION SICKNESS BY THIETHYLPERAZINE A66-80570

JOHNSTON, R. S.
SPACE SUIT DEVELOPMENT STATUS
NASA-TN-D-3291 N66-16942

JONES, G. M.
INFLUENCE OF EYE LID MOVEMENT UPON ELECTRO-OCULOGRAPHIC RECORDING OF VERTICAL SACCADIC EYE MOVEMENTS A66-17662

INTERACTIONS BETWEEN OPTOKINETIC AND VESTIBULO-OCULAR RESPONSES DURING HEAD ROTATION IN VARIOUS PLANES A66-80568

JONES, M. B.
INDIVIDUAL VARIATIONS IN POSTOCULAR LINES OF REGARD A66-80666

JONES, Q. W.
AIRCRAFT ACCIDENTS AND DISORIENTATION EXPERIENCES OF ARMY HELICOPTER PILOTS AS RELATED TO TRAINING AND INSTRUMENT DESIGN A66-80563

JORGENSEN, M.
EFFECT OF DECAMETHONIUM ON HEAD LIFT, HAND GRIP, AND RESPIRATORY MUSCLE POWER IN MAN A66-80598

JOUVET, M.
MORPHOLOGY AND FUNCTION OF SLEEP PHYSIOLOGY A66-80688

STUDY OF MECHANISMS OF DUALITY OF SLEEP A66-80703

JUDY, W. V.
EFFICACY OF CARDIOVASCULAR CONDITIONING WITH PULSATILE LEG CUFF TECHNIQUE IN DECREASING ORTHOSTATIC HYPOTENSION OF GEMINI V ASTRONAUTS N66-18012

K

KADO, R. T.
DECOMPRESSION SICKNESS OF DOGS AS AFFECTED BY PLASMA REPLACEMENT BY DEXTRAN AND HYPOTHERMIA A66-80668

KAKURIN, L.
WEIGHTLESSNESS EFFECTS ON CIRCULATORY SYSTEM AND MUSCULAR ACTIVITY OF ANIMALS AND HUMANS DURING SPACE FLIGHTS
JPRS-34064 N66-18028

KALAGIAN, S. P.
ARMY AVIATION CAREER PROGRAM AND AVIATOR PERSONNEL REQUIREMENTS THROUGH 1968 N66-16542

KANDROR, V. I.
ROLE OF PITUITARY AND ADRENAL GLANDS IN GENESIS OF AND RECOVERY FROM RADIATION PATHOLOGICAL SYMPTOMS
JPRS-34120 N66-17623

KANZOW, E.
CIRCULATION OF CEREBRAL CORTEX AND ARTERIAL BLOOD PRESSURE CORRELATION WITH ELECTROENCEPHALOGRAM OF RAPID EYE MOVEMENT STATE A66-80699

KAPLAN, H.
PREDICTING PILOT SUCCESS IN FIXED AND ROTARY WING

AVIATION TRAINING BY USE OF TEST BATTERIES
N66-16543

KATZ, A. I.
CONCENTRATION AND DILUTION OF URINE IN PERMANENT INHABITANTS AT REST AND EXERCISE IN HOT ENVIRONMENT AS RELATED TO FLUID INTAKE
A66-80685

KATZ, M. S.
DETECTION IN HOMOGENEOUS VISUAL FIELD UNDER CONDITIONS OF INFINITE DEPTH OF FOCUS
A66-80667

KAZDOVA, L.
EFFECT OF INFANTILE FEEDING RATE ON BODY WEIGHT LOSS, NITROGEN EXCRETION, AND SURVIVAL TIME DURING SUBSEQUENT EXPOSURE TO STARVATION, IN RATS
A66-80653

KEELS, E. W.
PERFORMANCE OF IMPLANTED ELECTRODE FOR ELECTRO-NYSTAGMOGRAPHY IN SQUIRREL MONKEY
A66-80621

KEENAN, J. J.
HUMAN PERFORMANCE AND BEHAVIOR ASSESSMENT IN AIR FORCE SYSTEMS AND SUBSYSTEMS
SSD-65-172/514/R N66-16664

KEIL, P. G.
SPACE FLIGHT HAZARDS - SURVEY OF PRESENT PROBLEMS IN MANNED SPACE FLIGHT A66-80628

KEMP, N. E.
IONIZING RADIATION EFFECT ON SUBMICROSCOPIC STRUCTURES OF IRRADIATED FROGS AND RESULTING ALTERATIONS IN METABOLIC FUNCTIONS
COO-1080-1 N66-17943

KENNEDY, R. S.
PHYSIOLOGICAL RESPONSES TO ANTIMOTION SICKNESS DRUGS - ANTIHISTAMINES, BELLADONNAS, AND PHENOTHIAZINES
NASA-CR-70175 N66-16971

KENT, E.
EFFECT OF TRITIATED THYMIDINE AND GAMMA RADIATION ON MORTALITY OF DROSOPHILA MELANOGASTER LARVAE
CNAEM-16 N66-18103

KETTEL, L. J.
MEASURING BLOOD OXYGEN TENSION WITH MICROCATHODE ELECTRODE A66-80622

KEYNAN, A.
MOLECULAR ASPECTS OF CIRCADIAN SYSTEMS IN MITOSIS AND PHOTOSYNTHESIS IN MICROORGANISMS
A66-80531

KHOROBRYKH, A.
SIMULATED MANNED FLIGHT IN SPACE TRAINING CAPSULE
JPRS-33934 N66-17620

KIBEL, B. M.
HELICOPTER RECONNAISSANCE TACTICS FOR AIR CAVALRY UNITS DURING WINTER ENVIRONMENT
N66-16531

KIBLER, H. H.
HEAT, FOOD INTAKE, AND AGING EFFECTS ON THYROID FUNCTION OF MALE RATS A66-80619

KILBURN, K. H.
MUSCULAR ORIGIN OF ELEVATED PLASMA POTASSIUM DURING PHYSICAL EXERCISE IN MAN
A66-80618

KINCAID, J. K.
TRACKING STUDY TO DETERMINE MAXIMUM CONTROL ELEMENT LAG AND MAXIMUM AND MINIMUM CONTROL SENSITIVITY TOLERATED IN MANUALLY CONTROLLED COMPENSATORY TRACKING TASK
NASA-TN-D-3242 N66-16548

KIRZON, M. V.
ROLE OF REFLEXES FROM SINOCAROTID ZONE IN RESPIRATION CONTROL DURING EXCESSIVE INTRAPULMONARY OXYGEN TENSION IN CATS
A66-80655

KITAI, S. T.
AMPLITUDE OF PHOTICALLY EVOKED POTENTIALS BY CONDITIONED STIMULUS IN CAT A66-80580

KLAPPER, E. A.
REGRESSION CURVES COMPUTED FROM URINARY CALCIUM EXCRETION AND BONE MASS DATA OBTAINED FROM MEN IN BED REST AND AMBULATORY STUDIES
N66-17684

KLAUS, E. J.
METHODS FOR EVALUATION OF PHYSICAL FITNESS
A66-80730

KLAUSEN, K.
CARDIAC OUTPUT IN MAN AT REST AND AT WORK DURING AND AFTER ACCLIMATIZATION TO 3,800 METERS
A66-80608

KLEIN, K. E.
PRINCIPLES AND RELATIONSHIPS TO REGULATIVE PROCESSES IN HUMANS - OXYGEN DEFICIENCY TESTS
NASA-TT-F-9737 N66-16574

KLINK, E.
ULTRASONIC METHODS TO MEASURE BONE MASSES AND OTHER TISSUES IN SITU N66-17679

KLOPPING, J. C.
AMELIORATIVE VALUE OF CARBOHYDRATE AND ELECTROLYTES TO SURVIVAL OF FASTING HUMAN SUBJECTS IN ARCTIC A66-80613

KOBRICK, J. L.
EFFECTS OF CHANGING LOCATION OF VISUAL STIMULI ON SIMPLE REACTION TIMES OF ADULTS WITH NORMAL VISION N66-16539

KOCH, C.
IMPORTANCE IN PILOT TRAINING AND EVALUATION OF INDUCED NYSTAGMUS IN SUBJECTS WITH SPONTANEOUS NYSTAGMUS - DIFFERENTIATION OF TYPES OF NYSTAGMUS WITH ELECTRONYSTAGMOGRAPHY A66-80716

EVALUATION OF HEARING LOSS AND VESTIBULAR DAMAGE IN PILOTS AND AIR FORCE PERSONNEL
A66-80717

KOHOUT, M.
EFFECT OF STARVATION AND PROLONGED EXERCISE ON FATTY ACID COMPOSITION IN ADIPOSE TISSUE AND EFFECT OF ADRENALIN ON COMPOSITION OF FATTY ACIDS RELEASED BY ADIPOSE TISSUE IN VITRO IN RATS
A66-80651

EFFECT OF STARVATION ON FATTY ACID COMPOSITION OF MYOCARDIUM IN RATS A66-80684

KOLLER, TH.
NEUROHUMORAL SLEEP TRANSMISSION IN RABBIT
A66-80690

KONNOVA, N. I.
COMBINED EFFECT OF ACCELERATION AND RADIATION ON PHYSIOLOGICAL FUNCTION IN MICE A66-80740

KONZA, E. A.
THERMOREGULATION IN MICE AND HELIUM-OXYGEN ATMOSPHERE CONDUCTIVITY A66-80681

KORESHKOV, A. A.
EFFECT OF GAS EXPANSION IN GASTROINTESTINAL TRACT DURING BAROMETRIC PRESSURE CHANGES ON RESPIRATORY AND CARDIOVASCULAR REFLEXES
N66-17159

KORNER, P. I.
ROLE OF SYMPATHETIC NERVOUS SYSTEM IN CIRCULATORY RESPONSE TO ARTERIAL HYPOXIA IN RABBITS
A66-80643

KOVALEV, E. E.
SHIELDING OF ASTRONAUTS FROM ELECTRONS AND BREMSSTRAHLUNG IN EARTH RADIATION BELTS
A66-80739

KOVROV, B. G.
MATHEMATICAL DESCRIPTION OF CONTINUOUS CULTURING OF MICROALGAE
JPRS-33831 N66-16315

KOZAK, G. P.
CIRCADIAN CYCLE OF URINARY HYDROCORTISONE IN HEALTHY SUBJECTS AND PATIENTS WITH CUSHING*S SYNDROME A66-80733

KRAFT, C. L.
HUMAN ENGINEERING AND PERFORMANCE CONSIDERATIONS IN SPACECRAFT DESIGN AND SPACE FLIGHT MISSIONS N66-16429

KRECEK, J.
COMPUTATIONAL ANALYSIS EMPLOYING DIGITAL COMPUTERS TO EVALUATE HYPOXIC STRESS REACTIONS IN MAN A66-17659

KREUZER, F.
OXYGEN PRESSURE VENTILATION RESPONSE CURVE WITH NORMAL HYDROGEN ION CONCENTRATION AND CARBON DIOXIDE PRESSURE IN DOGS A66-80592

KROFTA, K.
RESISTANCE OF MYOCARDIUM TO ANOXIA IN RATS ACCLIMATIZED TO HIGH ALTITUDE SIMULATION A66-80649

EFFECT OF DURATION OF ANOXIA, FREQUENCY OF STIMULATION, AND TEMPERATURE ON CONTRACTIBILITY OF MYOCARDIUM DAMAGED BY ANOXIA IN RATS A66-80650

EFFECT OF ADRENALECTOMY ON ADAPTATION TO HYPOXIA IN RATS - CHANGES IN HAEMOGLOBIN CONCENTRATION AND OSMOTIC RESISTANCE OF ERYTHROCYTES IN PERIPHERAL BLOOD A66-80652

KUMANICHKIN, S. D.
PRESSURE CHAMBER EXPERIMENTS FOR STUDYING CHANGES IN MOTOR, CADIOVASCULAR, RESPIRATORY, AND CENTRAL NERVOUS SYSTEMS DURING OXYGEN TOXICITY N66-17145

TOXIC EFFECT OF HIGH PARTIAL OXYGEN PRESSURE NOTED IN CONSTRICTION OF PERIPHERAL VISUAL FIELD N66-17162

L

LA CHANCE, P. A.
EFFECT OF WEIGHTLESSNESS AND IMMOBILIZATION ON BONE DEMINERALIZATION OF PRIMARY AND BACKUP GEMINI V CREW USING RADIOGRAPHIC BONE DENSITOMETRY N66-18014

LAMB, L. E.
DEHYDRATION AND WEIGHTLESSNESS IN MANNED SPACE FLIGHT N66-16428

LAMB, T. W.
VENTILATORY RESPONSE TO HYPOXIA AND CARBON DIOXIDE FOLLOWING CARBON DIOXIDE EXPOSURE AND SODIUM BICARBONATE INGESTION IN MAN A66-80588

MECHANICAL AND CHEMICAL VENTILATORY STIMULUS INTERACTION AT LOW AND HIGH ALTITUDES IN MAN. A66-80589

NATURE OF VIBRATION HYPERVENTILATION IN MAN. A66-80590

LAMBERTSEN, C. J.
DYNAMIC RESPONSE CHARACTERISTICS OF CHEMOREFLEX ROLE IN VENTILATORY DEPRESSION IN MAN ON ABRUPT ADMINISTRATION OF OXYGEN A66-80594

LANGE, R. L.
DIGITAL COMPUTER SIMULATION OF RESPIRATORY RESPONSE TO CEREBROSPINAL FLUID CARBON DIOXIDE TENSION OF CAT A66-80648

LANOIR, J.
RELATION OF DIENCEPHALIC ALTERATIONS TO ELECTROENCEPHALOGRAM CORTICAL ACTIVITY AND SLEEP IN CATS A66-80694

LANZETTA, J. T.
UNCERTAINTY, IMPORTANCE, AND AROUSAL AS DETERMINANTS OF PRE-DECISIONAL INFORMATION SEARCH A66-80747

LANZL, L. H.
IODINE 125 FOR USE IN BONE DENSITOMETRY N66-17677

ESTROGENS USED IN POSTMENOPAUSAL OSTEOPOROSIS TO RETARD LOSS IN BONE MASS N66-17682

LATARJET, R.
X-RAY AND GAMMA RAY EFFECTS ON DEOXYRIBONUCLEIC ACID /DNA/
EUR-2471.F N66-17938

LAULER, D. P.
CIRCADIAN CYCLE OF URINARY HYDROCORTISONE IN HEALTHY SUBJECTS AND PATIENTS WITH CUSHING*S SYNDROME A66-80733

LE BLANC, J.
INCREASED SENSITIVITY OF COLD ADAPTED RAT TO NORADRENALINE AS RELATED TO RESERPINE A66-80615

LE COUVIOUR, M.
GAMMA RADIATION EFFECTS ON CHIMAERAS OF FRUIT TREES
EUR-2546.F N66-18070

LEDERBERG, J.
OPTICAL PROPERTIES OF AMINO ACIDS USING MASS SPECTROMETRY AND GAS CHROMATOGRAPHY
AFOSR-65-1632 N66-16516

LEDOUX, L.
PREPARATION, PROPERTIES, AND STORAGE STABILITY OF MACROMOLECULES LABELLED BY TRITIUM AND BY BIOLOGICAL SYNTHESIS - NUCLEIC ACIDS, LYSOZYME, AND RIBONUCLEASE
EUR-2419.F N66-16439

LEE, A. B., JR.
HIGH FREE-FALL INJURIES - ANALYSIS OF FIFTY-THREE CASES A66-80634

LEEBEEK, H. J.
FUNDAMENTAL RESPONSE CURVES OF NORMAL AND DEUTERANOMALOUS OBSERVER DERIVED FROM CHROMATIC ADAPTATION DATA A66-80680

LEHMANN, D.
CHANGES IN PATTERNS OF HUMAN ELECTROENCEPHALOGRAM DURING FLUCTUATIONS OF PERCEPTION OF STABILIZED RETINAL IMAGE A66-80579

LEIDERMAN, P. H.
AUTOMATIC DATA PROCESSING IN PSYCHOPHYSIOLOGY - SYSTEM IN OPERATION A66-80638

LENZYCKI, H. P.
HUMAN PERFORMANCE AND BEHAVIOR ASSESSMENT IN AIR FORCE SYSTEMS AND SUBSYSTEMS
SSD-65-172/514/R N66-16664

LESTER, D.
ACUTE INHALATION TOXICITY OF OXYGEN DIFLUORIDE IN ALBINO RAT A66-19723

LEVINE, A.
INFRARED IMAGE-CONVERTER METHOD OF OBSERVING EYE MOTION IN FLASH BLINDNESS EXPERIMENTS. A66-80675

LEVINE, M.
PITCH DISCRIMINATION AT HIGH FREQUENCIES BY AIR AND BONE CONDUCTION A66-80663

LEVINSON, J.
ONE-STAGE MODEL FOR VISUAL TEMPORAL INTEGRATION A66-80676

LEVITT, R. A.
INFANTILE TREADMILL EXPERIENCE EFFECT ON BODY WEIGHT AND RESISTANCE TO EXHAUSTION IN RAT A66-17460

LEWIS, M. F.
CATEGORY JUDGMENTS AS FUNCTIONS OF FLASH LUMINANCE AND DURATION A66-80673

LEWIS, W. S.
HIGH FREE-FALL INJURIES - ANALYSIS OF FIFTY-THREE CASES A66-80634

LIANG, C.-A.
BASIC PRINCIPLES OF STIMULATED ELECTROAUDITORY PERCEPTION N66-16819

LIBOFF, R. L.
HYPOTHESIS TO EXPLAIN INHIBITING EFFECT OF MAGNETIC FIELDS ON CELL GROWTH RATE A66-80647

LINDOP, P. J.
LIFE SHORTENING IN MICE EXPOSED TO X-RAY IRRADIATION IN RELATION TO AGE AND HYPOXIA A66-80731

LINDSLEY, D. B.
VISUALLY EVOKED CORTICAL RESPONSE CORRELATES OF PERCEPTUAL MASKING AND ENHANCEMENT A66-80578

LITTLE, M. S.
BIBLIOGRAPHY OF GLIA CELL STUDIES
NASA-CR-70631 N66-18316

LITVIN, M.
PERFORMANCE OF IMPLANTED ELECTRODE FOR ELECTRO-NYSTAGMOGRAPHY IN SQUIRREL MONKEY A66-80621

LIVSHITS, V. A.
ELECTRIC ANALOGY OF TISSUE GAS SATURATION UNDER SIMULATED DECOMPRESSION CONDITIONS N66-17139

LLOYD, T. C., JR.
EFFECT OF BLOOD HYDROGEN ION CONCENTRATION ON HYPOXIC PULMONARY VASOCONSTRICTION IN DOGS A66-80586

LOBBAN, M. C.
DEVIATIONS FROM HUMAN RHYTHMIC METABOLIC FUNCTIONS A66-80536

LOTZ, W. E., JR.
HUMAN FACTORS RESEARCH AND DEVELOPMENT DEALING WITH COMMUNICATION AND CONTROL, RECONNAISSANCE, PERFORMANCE DECREMENT IN AIR MOBILITY, AND ARMY AVIATION PERSONNEL AND TRAINING - CONFERENCE
AD-456363 N66-16526

LOURENCO, R. V.
ELECTRICAL ACTIVITY OF PHRENIC NERVE FROM RESPIRATORY CENTER OF DOG DURING OBSTRUCTED BREATHING A66-80601

LUNDGREN, C. E. G.
ALTERNOBARIC VERTIGO AMONG SWEDISH PILOTS AS RELATED TO COLDS AND ABILITY TO EQUALIZE MIDDLE EAR PRESSURE A66-80569

LUNDSTROM, J.
PERMEABILITY MEASUREMENTS FOR DIFFUSION OF CARBON DIOXIDE AND GLUCOSE THROUGH SILICON RUBBER AND TEFLON IN STUDY OF ENZYMATIC BREAKDOWN PRODUCTS SEPARATION
NASA-CR-70190 N66-16968

M

MAC GREGOR, J.
MEASUREMENTS OF BONE VOLUME AND VERTEBRAL DENSITY N66-17681

MACEWEN, J. D.
INHALATION TOXICITY AT AMBIENT AND REDUCED PRESSURES IN MONKEYS, DOGS AND RODENTS UPON EXPOSURE TO OZONE, NITROGEN DIOXIDE AND CARBON TETRACHLORIDE A66-19724

MACK, P. B.
RADIOGRAPHIC BONE DENSITOMETRY FOR BONE MASS DETERMINATIONS IN OS CALCIS, MIDDLE PHALANX OF FIFTH DIGIT, AND PATELLA N66-17670

CALCIUM METABOLISM AND BONE MASS CHANGES RESULTING FROM CONTINUOUS PERIODS OF BED REST N66-17683

REGRESSION CURVES COMPUTED FROM URINARY CALCIUM EXCRETION AND BONE MASS DATA OBTAINED FROM MEN IN BED REST AND AMBULATORY STUDIES N66-17684

EFFECT OF WEIGHTLESSNESS AND IMMOBILIZATION ON BONE DEMINERALIZATION OF PRIMARY AND BACKUP GEMINI V CREW USING RADIOGRAPHIC BONE DENSITOMETRY N66-18014

MACKAY, D. M.
TEMPORAL FACTORS IN PATTERN VISION A66-80551

MACKLIN, M.
OXYGEN RECOVERY FROM METABOLIC CARBON DIOXIDE FOR SPACECRAFT ENVIRONMENT A66-18821

MACLEOD, D. F.
NOMOGRAM BY ASTRAND AND RYHMING AS PREDICTOR OF MAXIMUM OXYGEN INTAKE IN MAN DURING SUBMAXIMAL EXERCISE A66-80599

MAFFEI, L.
BRAIN STEM MECHANISMS ANTAGONISTIC TO RETICULAR ACTIVATING SYSTEM A66-80693

MAGER, M.
EFFECT OF PROLONGED COLD AND STARVATION, AND SUBSEQUENT REFEEDING ON PLASMA LIPIDS AND GLUCOSE IN NORMAL MAN A66-80630

MAHUT, H.
THALAMIC TRANSMISSION DURING SLEEP AND WAKEFULNESS IN CATS A66-80705

MALING, J. E.
ENZYME SUBSTRATE - RNA-RIBONUCLEASE AND SUCCINATE-CYTOCHROME C REDUCTASE - REACTIONS IN HIGH MAGNETIC FIELDS A66-80645

MALKOV, P. A.
EFFECT OF GAS EXPANSION IN GASTROINTESTINAL TRACT DURING BAROMETRIC PRESSURE CHANGES ON RESPIRATORY AND CARDIOVASCULAR REFLEXES N66-17159

MALM, J. R.
ELECTRICAL ACTIVITY OF PHRENIC NERVE FROM RESPIRATORY CENTER OF DOG DURING OBSTRUCTED BREATHING A66-80601

MALM, L. U.
ALTERNOBARIC VERTIGO AMONG SWEDISH PILOTS AS RELATED TO COLDS AND ABILITY TO EQUALIZE MIDDLE EAR PRESSURE A66-80569

MAMMARELLA, L.
CASCADE VAULT SAMPLER FOR BACTERIAL AEROSOLS A66-19087

MANDEL, P.
BIOCHEMISTRY DURING SLEEP AND WAKEFULNESS - REVIEW OF EXPERIMENTS IN BRAIN METABOLISM A66-80689

MANTEIFEL, V. M.
ROLE OF MITOCHONDRIA OF LYMPHOCYTES IN RESPONSE TO IONIZING RADIATION IN WHITE RATS A66-80523

MARBLE, G.
NEUTRON ACTIVATION AND SCINTILLATION COUNTERS FOR DETECTION OF SODIUM AND POTASSIUM IN BIOLOGICAL MEDIA
CEA-R-2837 N66-17491

MARON, M. E.
HISTORICAL BACKGROUND AND APPLICATIONS OF CYBERNETICS WHICH PERMITS THEORY RELATING INFORMATION PROCESSING TO LEARNING, THINKING, AND UNDERSTANDING
P-3144 N66-16946

MARTIN, E. W.
TREE-TOP ALTITUDE NAVIGATION FOR RECONNAISSANCE MISSION - ROLE OF AIRCRAFT TYPE, MISSION LENGTH, ILLUMINATION, WEATHER, AND CREW EXPERIENCE
N66-16532

MARTINEK, H.
RIGHTS AND ERRORS KEYS AS REFERENCE SYSTEM FOR IMAGE INTERPRETATION BY HUMAN OPERATORS
N66-16528

MASSRY, S.
CONCENTRATION AND DILUTION OF URINE IN PERMANENT INHABITANTS AT REST AND EXERCISE IN HOT ENVIRONMENT AS RELATED TO FLUID INTAKE
A66-80685

MATTER, M., JR.
AMELIORATIVE VALUE OF CARBOHYDRATE AND ELECTROLYTES TO SURVIVAL OF FASTING HUMAN SUBJECTS IN ARCTIC
A66-80613

MAYZNER, M. S.
IRRELEVANT INFORMATION EFFECTS ON SHORT-TERM RETENTION OF RELEVANT INFORMATION
A66-80583

MAZZA, G.
VISUAL PERCEPTION DURING POST-ROTATORY NYSTAGMUS IN PILOTS
A66-80718

MAZZELLA, G.
IONIZING RADIATION EFFECTS IN MICE PROTECTED WITH HYPOXIA OR WITH CHEMICALS
A66-19086

MAXIMAL RESISTANCE DURING ALTITUDE SIMULATION TO ACUTE HYPOXIA IN MICE TREATED WITH CORTISONE, TESTOSTERONE, AND SOMATOTROPIC HORMONE
A66-80723

HEMATOPOIETIC CHANGES IN DIFFERENT ANIMALS AFTER X-IRRADIATION AS COMPARED WITH ANALOGOUS CHANGES IN MAN
A66-80724

MC BRAYER, R. O.
PSYCHOPHYSIOLOGICAL RESPONSES IN HUMANS TO LOW FREQUENCY PRESSURE OSCILLATIONS
NASA-TN-D-3323
N66-18432

MC COOK, R. D.
CUTANEOUS VASCULAR AND SWEATING RESPONSES TO TYMPANIC AND SKIN TEMPERATURES IN NUDE SUBJECTS
A66-80609

MC DONOUGH, R.
HUMAN CENTRIFUGE STUDIES OF RELATIVE EFFECTIVENESS OF ANTIMOTION SICKNESS DRUGS, INCLUDING HYOSCINE D-AMPHETAMINE, MECLIZINE, CHLORPROMAZINE, THIETHYLPERAZINE, PROCHLORPERAZINE, AND TRIMETHOBENZAMIDE
A66-80573

MC DOWELL, A. A.
PERSEVERATION LEARNING SET FORMATION TO NON-REWARDED CUES BY NORMAL AND PREVIOUSLY IRRADIATED MONKEYS
A66-80585

MC GRATH, J. J.
REVISION IN CINEMA METHOD IMPROVES GEOGRAPHIC ORIENTATION IN AIRCRAFT PILOTS DURING SIMULATED LOW ALTITUDE FLIGHT
TR-751-5
N66-17587

MC IVER, A. H.
AVOIDANCE LEARNING, BLOOD GLUCOSE LEVEL, BODY WEIGHT, AND PROTEIN BOUND IODINE OF RAT EXPOSED TO COLD STRESS AND HABENULAR LESION
A66-80614

MC LAREN, A. D.
QUALITATIVE AND QUANTITATIVE TEST FOR ENZYME ACTIVITIES IN TERRESTRIAL SOIL ADAPTED TO MARS PROBE TELEMETRY PROCEDURES
NASA-CR-70058
N66-18163

MC LAREN, R. W.
STOCHASTIC AUTOMATIC MODELS FOR SYNTHESIS OF LEARNING SYSTEMS
TR-EE65-17
N66-17615

MC LEOD, M. E.
EFFECTS OF STREPTOMYCIN SULFATE IN TREATMENT OF ENDOLYMPHATIC HYDROPS - MENIERES DISEASE
NASA-CR-69862
N66-16446

MCNERNEY, J. M.
INHALATION TOXICITY AT AMBIENT AND REDUCED PRESSURES IN MONKEYS, DOGS AND RODENTS UPON EXPOSURE TO OZONE, NITROGEN DIOXIDE AND CARBON TETRACHLORIDE
A66-19724

MCROBERT, H.
MAGNITUDE ESTIMATION OF LOUDNESS, COMPARING EXPERIMENTAL RESULTS OF OBSERVERS ESTIMATES TO SONE SCALE
A66-17732

MEHLER, W. R.
ANATOMY OF CENTRE MEDIAN NUCLEUS OF LUYS
NASA-TM-X-56159
N66-18369

MEIER, M.
NOREPINEPHRINE AND ANGIOTENSIN EFFECTS ON CORONARY FLOW AND MYOCARDIAL OXYGEN CONSUMPTION IN CAT
A66-80635

MEINERI, G.
RESPIRATORY ASPECTS OF WALKING UNDER SUBGRAVITY CONDITIONS WITH VARIOUS GROUND FRICTION
A66-80726

MEISEL, M. N.
ROLE OF MITOCHONDRIA OF LYMPHOCYTES IN RESPONSE TO IONIZING RADIATION IN WHITE RATS
A66-80523

MELNIK, A. D.
SHIELDING OF ASTRONAUTS FROM ELECTRONS AND BREMSSTRAHLUNG IN EARTH RADIATION BELTS
A66-80739

MENAKER, M.
CIRCADIAN RHYTHM OF TESTICULAR RESPONSE AND PHOTOPERIODICITY IN HOUSE SPARROW, PASSER DOMESTICUS
A66-80546

MICHALEC, C.
EFFECT OF STARVATION ON FATTY ACID COMPOSITION OF MYOCARDIUM IN RATS
A66-80684

MILLER, E. F., II
EFFECTS OF STREPTOMYCIN SULFATE IN TREATMENT OF ENDOLYMPHATIC HYDROPS - MENIERES DISEASE
NASA-CR-69862
N66-16446

MILLER, N.
PHYSIOLOGICAL ENERGY EXPENDITURE FROM DONNING FULL PRESSURE SUIT UNDER SPACE AND TIME LIMITATIONS
N66-17394

MILLER, N. D.
VISUAL RECOVERY IN HUMANS FROM BRIEF EXPOSURES TO HIGH LUMINANCE
A66-80674

MILLER, U. M.
MEASUREMENT OF MUSCLE TREMOR FREQUENCY DISTRIBUTION ASSOCIATED WITH HAND-HELD FIELD GLASSES AND RESOLUTION EFFECTS
A66-80576

MIRABELLI, R. E.
COMPUTER PROGRAM TO SIMULATE SECOND ORDER SERVO SYSTEM DYNAMICS UNDER AUTOMATIC AND MANUAL CONTROL
NASA-CR-70340
N66-17082

MIRRAKHIMOV, M. M.
PHYSIOLOGY OF CHRONIC ADAPTATION TO HIGH ELEVATIONS - ACCLIMIZATION
JPRS-33871
N66-16325

MITCHELL, R. A.
POSTHYPERVENTILATION APNEA IN AWAKE MAN
A66-80591

MITCHELL, R. E.
PSYCHOLOGICAL AND PHYSIOLOGICAL TESTING IN SUCCESS PREDICTION IN FLIGHT TRAINING PROGRAMS
NASA-CR-69895
N66-16192

MITHOEFER, J. C.
MECHANICAL AND CHEMICAL VENTILATORY STIMULUS INTERACTION AT LOW AND HIGH ALTITUDES IN MAN. A66-80589

MIYADA, D. S.
URINARY BLADDER CALCULI FORMED AT HIGH ALTITUDE IN RATS A66-80670

MOHR, G. C.
L F AND INFRASONIC NOISE EFFECTS ON MANS CARDIAC RHYTHM, HEARING, VISION, MOTOR CONTROL, SPATIAL ORIENTATION, SPEECH AND SUBJECTIVE TOLERANCE A66-17656

MOK, H. Y. I.
ROLE OF SYMPATHETIC NERVOUS SYSTEM IN CIRCULATORY RESPONSE TO ARTERIAL HYPOXIA IN RABBITS A66-80643

MOLBECH, S.
EFFECT OF DECAMETHONIUM ON HEAD LIFT, HAND GRIP, AND RESPIRATORY MUSCLE POWER IN MAN A66-80598

MOLESKO, N. M.
PRESSURIZED SPACE SUITS TO SIMULATE WEIGHTLESSNESS AT ZERO GRAVITY - EFFECT OF CLOTHING CONSTRAINTS ON HUMAN PERFORMANCE
REL-HFG-65-1 N66-17386

MONNIER, M.
NEUROHUMORAL SLEEP TRANSMISSION IN RABBIT A66-80690

MONTILLA, J.
BONE MINERAL CONTENT IN DOMESTIC HEN MEASURED BY ATTENUATION OF MONOENERGETIC PHOTON BEAM N66-17675

MONTROLL, E. W.
ONE-DIMENSIONAL ISING MODEL TO EXPLAIN MELTING TEMPERATURE LINEAR DEPENDENCE OF COPOLYMERIC D NA
BN-425 N66-17005

MOORE, P.
LIFE ON MARS - CONDITIONS, POSSIBLE TYPES OF ORGANISMS AND THEORIES OF ADVANCED FORMS OF LIFE A66-80582

MORAN, F.
MEASURING BLOOD OXYGEN TENSION WITH MICROCATHODE ELECTRODE A66-80622

MORELAND, S.
TECHNIQUE FOR PERFORMING MISSION ANALYSIS ON FIXED AND ROTARY WING AIRCRAFT N66-16538

MORETTI, G.
EXPERIMENTS WITH ANTIHYPEROXIC PHARMACOPROTECTION IN RATS A66-80715

MORICCA, G.
THERAPEUTIC USES OF OXYGEN AT HIGH PRESSURE AND PREVENTION OF ITS TOXICITY IN RATS A66-80644

MORIN, F.
AMPLITUDE OF PHOTICALLY EVOKED POTENTIALS BY CONDITIONED STIMULUS IN CAT A66-80580

MORRIS, J.
BIBLIOGRAPHY OF GLIA CELL STUDIES
NASA-CR-70631 N66-18316

MORRISON, J. F.
ROLE OF PHYSICAL CONDITIONING IN ACCLIMATIZATION OF HUMAN SUBJECTS WORKING IN HUMID HEAT A66-80612

MORTIMER, J. E.
BIOSATELLITE FOR TV MONITORING OF DEVELOPMENT OF OPOSSUM EMBRYONIC FETUS IN SPACE ENVIRONMENT A66-18583

ZERO-GRAVITY EFFECT ON OPOSSUM FETUS OBSERVED BY TV SYSTEM IN PROPOSED SATELLITE A66-18726

MORUZZI, G.
BRAIN STEM MECHANISMS ANTAGONISTIC TO RETICULAR ACTIVATING SYSTEM A66-80693

MOSER, K. M.
POLAROGRAPHIC MEASUREMENT OF BLOOD OXYGEN TENSION AS AFFECTED BY PH, HEPARIN, HEMATOCRIT AND ENVIRONMENTAL TEMPERATURE A66-80623

MUELLER, D. D.
MAINTENANCE OF SPACE VEHICLES DURING SHORT PERIODS OF SIMULATED WEIGHTLESSNESS BY WORKERS WEARING PRESSURIZED SUITS N66-17389

MUKHAMEDOV, T.
EFFECT OF COMBINED ACTION OF RADIOIODINE-131 AND NOISE ON CARDIAC ACTIVITY IN DOGS A66-80654

MURAKCHOVSKI, K. I.
PHYSIOLOGICAL REACTIONS OF HUMAN BODY TO TRANSVERSE ACCELERATION AND MEANS OF INCREASING RESISTANCE A66-80560

N

NAEDTS, J. P.
CHANGES IN ESOPHAGEAL PRESSURE TRANSMISSION DURING DETERMINATION OF LUNG COMPLIANCE IN DOGS A66-80593

NAKAMURA, H.
EYE MOVEMENTS OF WAKING NORMAL SUBJECTS AND SCHIZOPHRENICS WITH CLOSED EYES A66-80661

NAKAMURA, R. M.
DECOMPRESSION SICKNESS OF DOGS AS AFFECTED BY PLASMA REPLACEMENT BY DEXTRAN AND HYPOTHERMIA A66-80668

URINARY BLADDER CALCULI FORMED AT HIGH ALTITUDE IN RATS A66-80670

NAQUET, R.
RELATION OF DIENCEPHALIC ALTERATIONS TO ELECTROENCEPHALOGRAM CORTICAL ACTIVITY AND SLEEP IN CATS A66-80694

NATOCHIN, IU. B.
STUDY OF KIDNEY FUNCTION IN PERSONNEL OF SPACECRAFT **VOSKHOD** AFTER SPACE MISSION A66-80745

NEARY, G. J.
BIOLOGICAL HAZARDS OF RADIATIONS IN SPACE AND CHEMICAL PROTECTION AND METHODS OF TREATMENT A66-80520

NESSIRIO, B. A.
HUMAN BODY ADAPTIVE REACTION TO INCREASED AIR PRESSURE BASED ON HIGHER NERVOUS SYSTEM STUDY N66-17152

NETTELAND, O.
HIGH ENERGY ELECTRON PHOTOGRAPHIC ISODOSE MEASUREMENTS IN INHOMOGENEOUS MEDIA
CONF-640918-2 N66-17546

NEUMANN, W. F.
DETERMINING THICKNESS AND MINERAL CONTENT IN VERTEBRA AND OTHER BONES BY X-RAY AND OTHER DENSITOMETRY - APPLICATION OF TECHNIQUES TO HUMAN STUDIES
NASA-SP-64 N66-17665

NEUSCHULER, R.
RETINAL DETACHMENT IN PILOT INCURRED IN FLIGHT - CASE HISTORY A66-80728

NEWTON, J. L.
BLOOD, PLASMA, AND RED CELL VOLUMES OF YOUNG AND OLD MEN DURING REST AND EXERCISE IN DESERT ENVIRONMENT AND AT HIGH ALTITUDE A66-80606

NICHOLS, G., JR.
DIURNAL VARIATION IN COLLAGEN RIBONUCLEIC ACID, DEOXYRIBONUCLEIC ACID, LACTATE, AND CALCIUM

METABOLIC ACTIVITY OF RAT BONE TISSUE
A66-80574

NIELSON, H. C.
AVOIDANCE LEARNING, BLOOD GLUCOSE LEVEL, BODY WEIGHT, AND PROTEIN BOUND IODINE OF RAT EXPOSED TO COLD STRESS AND HABENULAR LESION
A66-80614

NIKITIN, M.
RADIATION EXPOSURE OF ASTRONAUTS DURING LUNAR MISSIONS
A66-80683

NIMS, L. F.
BIOELECTRICITY HISTORICAL REVIEW AND PRINCIPLES OF MEMBRANE POTENTIAL - ELECTROPHYSIOLOGY
BNL-9337
N66-17175

THERMODYNAMIC PRINCIPLES OF ION TRANSFER ACROSS MEMBRANES FOR NUTRIENT AND EXCREMENT FLOW IN BIOLOGICAL SYSTEM - ELECTROPHYSIOLOGY
BNL-9338
N66-17176

NISHIDA, S.
EXTRACTS OF CHLORELLA CELLS AS GROWTH FACTOR OF PROTOZOAN TETRAHYMENA PYRIFORMIS,
A66-80735

NORDIN, B. E. C.
CORTICAL BONE VOLUME AND LUMBAR SPINE DENSITY RELATED TO AGING IN WOMEN - X-RAY MEASUREMENTS OF RELATIVE VERTEBRAL DENSITY
N66-17669

MEASUREMENTS OF BONE VOLUME AND VERTEBRAL DENSITY
N66-17681

NORTH, W. J.
ASTRONAUT SELECTION AND CREW PREPARATION PROCEDURES FOR GEMINI AND APOLLO PROGRAMS
A66-18578

NOWITZKY, A. M.
TEXT ON PREVENTION OF CONTAMINATION OF OTHER CELESTIAL BODIES BY TERRESTRIAL ORGANISMS VIA SPACE VEHICLES
A66-19238

O

OBERMAN, A.
PSYCHOLOGICAL AND PHYSIOLOGICAL TESTING IN SUCCESS PREDICTION IN FLIGHT TRAINING PROGRAMS
NASA-CR-69895
N66-16192

OBLAPENKO, P. V.
ROLE OF PROPRIOCEPTIVE IMPULSES DURING RESPIRATION WITH INCREASED INTRAPULMONARY PRESSURE IN REGULATING RESPIRATION AND CIRCULATION
N66-17156

CHANGES IN CAROTID SINUS PRESSOR AND DEPRESSOR REFLEXES DURING RESPIRATION UNDER INCREASED INTRAPULMONARY PRESSURE
N66-17157

ROLE OF VAGUS NERVES IN CIRCULATORY AND RESPIRATORY REACTIONS DURING INCREASED INTRAPULMONARY PRESSURE
N66-17158

OCONNOR, W. F.
AIR TRAFFIC CONTROL INCIDENT REPORTING SYSTEM DESIGN TO MAXIMIZE CORRECTIVE FEEDBACK
AM-65-10
N66-16583

OGDEN, F. W.
AIRCRAFT ACCIDENTS AND DISORIENTATION EXPERIENCES OF ARMY HELICOPTER PILOTS AS RELATED TO TRAINING AND INSTRUMENT DESIGN
A66-80563

OKUDA, M.
EXTRACTS OF CHLORELLA CELLS AS GROWTH FACTOR OF PROTOZOAN TETRAHYMENA PYRIFORMIS,
A66-80735

ORLOV, I. V.
DETERMINATION OF THRESHOLD EXCITABILITY OF SEMICIRCULAR CANALS WITH THERMAL STIMULATION METHOD IN PIGEONS
A66-80738

OSANOV, D. P.
SHIELDING OF ASTRONAUTS FROM ELECTRONS AND BREMSSTRAHLUNG IN EARTH RADIATION BELTS
A66-80739

OSTERHOFF, W. E.
REVISION IN CINEMA METHOD IMPROVES GEOGRAPHIC ORIENTATION IN AIRCRAFT PILOTS DURING SIMULATED LOW ALTITUDE FLIGHT
TR-751-5
N66-17587

P

PALESTINI, M.
CORTICAL ACTIVITY DURING SLEEP AND WAKEFULNESS IN CATS
A66-80706

PANFEROVA, M. E.
CHANGES IN WORKING CAPACITY OF MUSCLE AFTER EXPOSURE OF MAN TO HYPOKINETIC CONDITIONS AND IMPORTANCE TO MANNED SPACE FLIGHT
A66-80737

PANIN, A. F.
HYPEROXEMIC AND HYPOXEMIC CONVULSION EFFECTS ON SUGAR, LACTIC ACID, AND INORGANIC PHOSPHORUS LEVELS IN DOG BLOOD AND SPINAL FLUID
N66-17147

PAO, E. M.
AGE ASSOCIATED BONE LOSS MEASUREMENTS IN HANDS OF THREE RACES
N66-17685

PAOLUCCI, G.
IONIZING RADIATION EFFECTS IN MICE PROTECTED WITH HYPOXIA OR WITH CHEMICALS
A66-19086

INFLUNCE OF MODERATE ALCOHOLEMIC VALUES ON SOME ASPECTS OF PSYCHOMOTOR REACTIVITY
A66-80727

PARADISE, R. R.
CONVERSION OF GLUCOSIDE, ACETYL STROPHANTHIDIN, INDUCED VENTRICULAR TACHYCARDIA TO SINUS RHYTHM BY ETHYL ALCOHOL IN DOGS
A66-80626

PARIZKOVA, J.
EFFECT OF STARVATION AND PROLONGED EXERCISE ON FATTY ACID COMPOSITION IN ADIPOSE TISSUE AND EFFECT OF ADRENALIN ON COMPOSITION OF FATTY ACIDS RELEASED BY ADIPOSE TISSUE IN VITRO IN RATS
A66-80651

PARKER, T. C.
HUMAN PERFORMANCE AND BEHAVIOR ASSESSMENT IN AIR FORCE SYSTEMS AND SUBSYSTEMS
SSD-65-172/514/R
N66-16664

PASSMORE, G. D.
PROPOSED CEREBRAL CORTEX DUPLICATION OF FOURIER OPTICAL TRANSFORM PROCESS AND SPACIAL FILTERING - MATHEMATICAL MODEL
GE/EE/65-18
N66-16986

PATTERSON, J. L., JR.
SCALENE AND STERNOMASTOID MUSCLE FUNCTION AND RESPIRATION IN HUMANS
A66-80597

PATZ, A.
EFFECT OF PURE OXYGEN BREATHING ON IMMATURE RETINAL VESSELS IN MAN AND EXPERIMENTAL ANIMALS
A66-80642

PAUK, G. L.
CIRCADIAN CYCLE OF URINARY HYDROCORTISONE IN HEALTHY SUBJECTS AND PATIENTS WITH CUSHING'S SYNDROME
A66-80733

PEARSON, R. G.
AIR TRAFFIC CONTROL INCIDENT REPORTING SYSTEM DESIGN TO MAXIMIZE CORRECTIVE FEEDBACK
AM-65-10
N66-16583

PESMAN, G. J.
PSYCHOPHYSIOLOGICAL RESPONSES IN HUMANS TO LOW FREQUENCY PRESSURE OSCILLATIONS
NASA-TN-D-3323
N66-18432

PETERSEN, O.
CASE HISTORY OF MYOCARDIAL INFARCTION AFTER GASTROINTESTINAL ACUTE HEMORRHAGE IN COMMERCIAL

PILOT A66-80571

PETROV, R.
IMMUNOLOGIC PROBLEMS OF SPACE BIOLOGY AND MEDICINE
JPRS-33922 N66-16324

PIERCE, B. F.
PRESSURIZED SUITS USED IN WATER IMMERSION STUDIES WHICH SIMULATE ZERO GRAVITY EFFECTS
N66-17390

PISANO, M.
CORTICAL ACTIVITY DURING SLEEP AND WAKEFULNESS IN CATS A66-80706

PITTENDRIGH, C. S.
MECHANISM OF ENTRAINMENT OF CIRCADIAN RHYTHM BY LIGHT CYCLES USING DROSOPHILA PUPAL ECLOSION RHYTHM AS MODEL A66-80539

PIZZIGALLO, G.
MEDICAL USE OF HELICOPTERS AND GENEVA CONVENTION
A66-80725

PLATT, B. S.
INTERACTION OF DIETARY PROTEIN AND CALCIUM ON GROWTH AND MAINTENANCE OF BONES OF YOUNG, ADULT, AND AGED RATS A66-80711

POKROVSKAIA, G. L.
EFFECTS OF VIBRATION, ACCELERATION AND IRRADIATION ON CHROMOSOMES IN MICE A66-80741

POLAR, E.
PRODUCTION OF TOBACCO PLANT MUTANTS RESISTANT TO BLUE MOLD DISEASE BY SEED TREATMENT WITH IONIZING RADIATION - LITERATURE SURVEY
CNAEM-18 N66-18147

POLLACK, I.
MEMORY SPAN WITH EFFICIENT CODING PROCEDURES IN HUMANS A66-80665

POLUMISKOV, YU. M.
PULMONARY PRESSURE TRAUMA MECHANISM DURING AIR AND OXYGEN BREATHING N66-17153

EFFECT OF OXYGEN BREATHING IN RESORPTION OF GAS EMBOLISM IN VASCULAR SYSTEM OF CATS AND ON COURSE OF PULMONARY PRESSURE TRAUMA
N66-17154

TREATMENT OF PULMONARY PRESSURE TRAUMA BY REMOVAL OF EXCESS GAS FROM INTERPLEURAL CAVITIES
N66-17155

POMPEIANO, O.
SOMATIC AFFERENT VOLLEYS AND INHIBITORY CONTROL OF SPINAL REFLEXES DURING SLEEP IN CATS
A66-80702

POPMA, D. C.
POTENTIAL SOURCES AND METHODS DESCRIPTION FOR SPACE VEHICLE WATER RECOVERY INCLUDING MISSION WEIGHT PENALTIES
NASA-TM-X-56123 N66-17221

PORTNER, D. M.
DRY HEAT EFFECTIVENESS IN MICROORGANISM STERILIZATION AT 105 DEG C FOR SPACE PROBE APPLICATIONS
NASA-CR-70321 N66-17088

POSTUPAEV, V. V.
PHOSPHORYLATION OF FRUCTOSE IN RAT SKELETAL MUSCLES AND LIVER TISSUES DURING HYPOXIA AT SIMULATED ALTITUDE A66-80656

POTSAID, M. S.
SOLID CHEMICAL SYSTEM FOR CHARGED PARTICLE DOSIMETRY
NASA-CR-70462 N66-17481

POUPA, O.
RESISTANCE OF MYOCARDIUM TO ANOXIA IN RATS ACCLIMATIZED TO HIGH ALTITUDE SIMULATION
A66-80649

EFFECT OF DURATION OF ANOXIA, FREQUENCY OF STIMULATION, AND TEMPERATURE ON CONTRACTIBILITY OF MYOCARDIUM DAMAGED BY ANOXIA IN RATS
A66-80650

EFFECT OF ADRENALECTOMY ON ADAPTATION TO HYPOXIA IN RATS - CHANGES IN HAEMOGLOBIN CONCENTRATION AND OSMOTIC RESISTANCE OF ERYTHROCYTES IN PERIPHERAL BLOOD A66-80652

POWERS, E. M.
MICROORGANIC CONTAMINATION OF STAINLESS STEEL DUE TO HANDLING BY PERSONNEL
NASA-TM-X-55408 N66-17240

PRADKO, F.
WHOLE-BODY HUMAN RESPONSE TO RANDOM AND SINUSOIDAL VIBRATION AT VARIOUS MODES N66-16535

PROCHAZKA, J.
RESISTANCE OF MYOCARDIUM TO ANOXIA IN RATS ACCLIMATIZED TO HIGH ALTITUDE SIMULATION
A66-80649

EFFECT OF DURATION OF ANOXIA, FREQUENCY OF STIMULATION, AND TEMPERATURE ON CONTRACTIBILITY OF MYOCARDIUM DAMAGED BY ANOXIA IN RATS
A66-80650

EFFECT OF ADRENALECTOMY ON ADAPTATION TO HYPOXIA IN RATS - CHANGES IN HAEMOGLOBIN CONCENTRATION AND OSMOTIC RESISTANCE OF ERYTHROCYTES IN PERIPHERAL BLOOD A66-80652

PUSHKIN, V. N.
HEURISTIC PROGRAMMING, CYBERNETICS AND PSYCHOLOGY OF REASONING, AND AUTOMATION OF HUMAN INTELLECT
JPRS-34182 N66-18051

Q

QUATTRONE, P. D.
PERFORMANCE OF EXPOSURE SYSTEM FOR SMALL ANIMALS AT ATMOSPHERIC AND REDUCED PRESSURES
A66-80625

R

RADNOFSKY, M. I.
SPACE SUIT DEVELOPMENT STATUS
NASA-TN-D-3291 N66-16942

PORTABLE LIFE SUPPORT SYSTEM AND PRESSURIZED SUIT FOR EXTRAVEHICULAR MOBILITY UNIT TO PROTECT MAN AGAINST LUNAR SURFACE AND FREE SPACE HAZARDS
N66-17387

RADZIEVSKII, G. B.
SHIELDING OF ASTRONAUTS FROM ELECTRONS AND BREMSSTRAHLUNG IN EARTH RADIATION BELTS
A66-80739

RAKUSAN, K.
EFFECT OF ADRENALECTOMY ON ADAPTATION TO HYPOXIA IN RATS - CHANGES IN HAEMOGLOBIN CONCENTRATION AND OSMOTIC RESISTANCE OF ERYTHROCYTES IN PERIPHERAL BLOOD A66-80652

RANDALL, W. C.
CUTANEOUS VASCULAR AND SWEATING RESPONSES TO TYMPANIC AND SKIN TEMPERATURES IN NUDE SUBJECTS
A66-80609

RAO, K. R. R.
PRACTICAL AND PHYSIOLOGICAL ASPECTS OF GIVING ANESTHESIA AT HIGH ALTITUDES A66-80510

RAPER, A. J.
SCALENE AND STERNOMASTOID MUSCLE FUNCTION AND RESPIRATION IN HUMANS A66-80597

RAPOPORT, A.
STUDY OF HUMAN CONTROL IN STOCHASTIC MULTISTAGE DECISION TASK A66-80636

RAPP, R. M.
EVALUATION OF PHYSICAL CONDITION OF GEMINI V ASTRONAUTS BY CARDIOVASCULAR SYSTEM RESPONSE TO CALIBRATED WORK LOAD N66-18013

RASCH, P. J.
TIME FOR ACCLIMATIZATION OF HEALTHY YOUNG EXERCISING MEN TO HOT, WET ENVIRONMENT
A66-80616

REED, L. E.
COMPUTER USE FOR HANDLING ADVANCED SYSTEMS HUMAN FACTORS TASK DATA
NASA-CR-70513 N66-18161

REINBERG, A.
VARIATIONS OF RESISTANCE AND RESPONSIVENESS AND CIRCADIAN ADRENAL CYCLE IN NORMAL SUBJECTS AND PATIENTS
A66-80535

REITE, M. R.
CEREBRAL CORTEX AND SUBCORTEX RELATIONSHIPS IN CHIMPANZEE DURING SLEEP, WAKEFULNESS, AND RAPID EYE MOVEMENT STATE
A66-80704

RHODES, J. M.
CEREBRAL CORTEX AND SUBCORTEX RELATIONSHIPS IN CHIMPANZEE DURING SLEEP, WAKEFULNESS, AND RAPID EYE MOVEMENT STATE
A66-80704

HUMAN ELECTROENCEPHALOGRAM GENERATOR SPECTRAL ANALYSIS IN POSTERIOR CEREBRAL REGIONS
NASA-CR-57050 N66-18389

RHODES, P. G.
POLAROGRAPHIC MEASUREMENT OF BLOOD OXYGEN TENSION AS AFFECTED BY PH, HEPARIN, HEMATOCRIT AND ENVIRONMENTAL TEMPERATURE
A66-80623

RICCIO, D. C.
VESTIBULAR SENSITIVITY AND ASSOCIATED LOCOMOTOR RESPONSES OF RATS IN ROTATING ENVIRONMENT
NASA-CR-70394 N66-17271

RICH, C.
ULTRASONIC METHODS TO MEASURE BONE MASSES AND OTHER TISSUES IN SITU
N66-17679

RICH, L. G.
REGENERATIVE WASTE DISPOSAL SYSTEM SUPPLYING PHYSIOLOGICAL REQUIREMENTS FOR HUMANS IN SPACE CRAFT
PB-168787 N66-17429

RICHARDSON, D. L.
PASSIVE TEMPERATURE CONTROL FOR EXTRAVEHICULAR SPACE SUITS
AMRL-TR-65-156 N66-16743

ROBERTS, S. K.
ROLE OF ENDOCRINE AND CENTRAL NERVOUS SYSTEMS IN VARIOUS BIOLOGICAL RHYTHMS IN INSECTS, CRUSTACEANS AND VERTEBRATES CONCERNING METABOLISM
A66-80534

ROCKOFF, S. D.
THEORETICAL ASPECTS OF RADIOGRAPHIC DENSITOMETRY USED TO DETERMINE MINERAL CONTENT IN BONE
N66-17667

RODIN, S. A.
PHYSIOLOGICAL REACTIONS OF HUMAN BODY TO TRANSVERSE ACCELERATION AND MEANS OF INCREASING RESISTANCE
A66-80560

ROGEL, S.
CHANGES IN VENTILATION AND PULMONARY MECHANICS INDUCED BY HYPERTONIC SODIUM CHLORIDE IN DOGS
A66-80587

ROGERS, T. A.
AMELIORATIVE VALUE OF CARBOHYDRATE AND ELECTROLYTES TO SURVIVAL OF FASTING HUMAN SUBJECTS IN ARCTIC
A66-80613

ROHMANN, C. G.
AGE ASSOCIATED BONE LOSS MEASUREMENTS IN HANDS OF THREE RACES
N66-17685

ROOFE, P. G.
RENAL CHANGES ASSOCIATED WITH ACCLIMATIZATION TO HIGH ALTITUDE IN RATS
A66-80553

ROSADINI, G.
CORTICAL ACTIVITY DURING SLEEP AND WAKEFULNESS IN CATS
A66-80706

ROSS, H. E.
SIZE CONSTANCY EFFECT DURING UNDERWATER IMMERSION
A66-80552

ROSS, J. C.
PULMONARY DIFFUSION AND CAPILLARY BLOOD VOLUME IN DOGS AT REST AND WITH EXERCISE
A66-80600

ROSSANIGO, F.
EXPERIMENTS WITH ANESTHESIZED DOGS SUBJECTED TO G ACCELERATIONS, OBSERVING BEHAVIOR OF ARTERIAL OXYGEN SATURATION AND PULMONARY VENTILATION DURING SHORT PERIODS
A66-19083

ROSSI, G. F.
CORTICAL ACTIVITY DURING SLEEP AND WAKEFULNESS IN CATS
A66-80706

ROTA, P.
EXPERIMENTS WITH ANESTHESIZED DOGS SUBJECTED TO G ACCELERATIONS, OBSERVING BEHAVIOR OF ARTERIAL OXYGEN SATURATION AND PULMONARY VENTILATION DURING SHORT PERIODS
A66-19083

ROTBLAT, J.
LIFE SHORTENING IN MICE EXPOSED TO X-RAY IRRADIATION IN RELATION TO AGE AND HYPOXIA
A66-80731

ROTH, H. P.
ENERGY EXPENDITURE, METABOLIC HEAT PRODUCTION AND OXYGEN CONSUMPTION, AND WORK CAPACITY OF MEN CLOTHED IN SPACE SUITS
N66-17395

RUSHMER, R. F.
PHYSIOLOGICAL AND CLINICAL APPLICATIONS OF TRANSCUTANEOUS DOPPLER FLOWMETER APPLYING TRANSDUCER TO SKIN SURFACE OVER STRATEGIC SITES TO INDICATE BLOOD FLOW VELOCITY
A66-80604

OPERATIONAL CAPABILITY AND PHYSIOLOGICAL AND CLINICAL APPLICATIONS OF TRANSCUTANEOUS ULTRASONIC BLOOD VELOCITY METER
A66-80620

RUSHTON, W. A. H.
GLAREMITS MEASUREMENT BY CONE THRESHOLDS AND BY BLEACHING OF CONE PIGMENTS
A66-80677

RYFF, M. G.
ADSORPTION CHANGES IN NERVOUS SYSTEM AND INTERNAL ORGANS OF MICE DURING OXYGEN-INDUCED CONVULSIONS
N66-17144

S

SACKLER, A. M.
ENDOCRINE SYSTEM OF MALE AND FEMALE RATS AS AFFECTED BY VIBRATIONAL STRESS
A66-80566

SACKNER, M. A.
SITE OF PULMONARY VASOMOTOR ACTIVITY DURING HYPOXIA OR SEROTONIN ADMINISTRATION IN DOGS
A66-80554

SAFONOV, V. A.
ROLE OF REFLEXES FROM SINOCAROTID ZONE IN RESPIRATION CONTROL DURING EXCESSIVE INTRAPULMONARY OXYGEN TENSION IN CATS
A66-80655

SAHA, A. K.
STRUCTURAL RELATION OF ABNORMAL CALCIFICATIONS WITH COLLAGEN MATRIX IN DISEASED HUMAN BONES - STUDY OF BONE DYSPLASIA BY X-RAY DIFFRACTION
N66-16362

SAHA, N. N.
STRUCTURAL RELATION OF ABNORMAL CALCIFICATIONS WITH COLLAGEN MATRIX IN DISEASED HUMAN BONES - STUDY OF BONE DYSPLASIA BY X-RAY DIFFRACTION
N66-16362

SAINT GIRONS, M. C.
PERSISTENCE OF CIRCADIAN RHYTHM IN HIBERNATING RODENTS
A66-80540

SAKAMOTO, S.
EYE MOVEMENTS OF WAKING NORMAL SUBJECTS AND SCHIZOPHRENICS WITH CLOSED EYES A66-80661

SAKSONOV, P. P.
COSMIC RADIATION HAZARDS AND EFFECT ON MAN AND ANIMALS IN RELATION TO SOLAR ACTIVITY AND FLIGHT DURATION A66-80519

RADIATION EXPOSURE OF ASTRONAUTS DURING LUNAR MISSIONS A66-80683

COMBINED EFFECT OF ACCELERATION AND RADIATION ON PHYSIOLOGICAL FUNCTION IN MICE A66-80740

SALTZMAN, H. A.
PROTECTIVE EFFECT OF HYPERBARIC OXYGENATION IN CEREBRAL ANOXIA IN DOGS A66-80556

EFFECT OF HYPERBARIA AND HYBAROXIA ON CALIBER OF RETINAL AND CEREBRAL VESSELS IN MAN A66-80581

SASAKI, E. H.
HUMAN PERFORMANCE IN PRESSURIZED SUITS UNDER ZERO GRAVITY CONDITIONS N66-17388

SAUNDERS, J. F.
N ASA BIOSATELLITE STUDY OF ORGANISM IN SPACE ENVIRONMENT, WITH EMPHASIS ON WEIGHTLESSNESS AND RADIATION EFFECT A66-17615

SAVAGE, N.
OXYGEN CONSUMPTION AND SERUM LIPID LEVELS OF BABOON, PAPIO URSINUS, GIVEN SATURATED AND POLYUNSATURATED FAT DIETS A66-80710

SAVICH, A. A.
DECOMPRESSION SICKNESS PROVOCATION BY EXPOSING ANIMALS TO HIGH ALTITUDE PRESSURE AFTER DECOMPRESSION N66-17132

DECOMPRESSION AIR EMBOLIC PROCESS IN ANIMALS AND PHYSIOLOGICAL RESPONSES N66-17133

PHYSIOLOGICAL RESPONSES IN RABBITS TO ARTIFICIAL EMBOLISM DUE TO INJECTIONS OF CARBON DIOXIDE, OXYGEN, AIR, AND HELIUM-OXYGEN MIXTURE N66-17134

ARTIFICIAL AIR EMBOLISM AND DECOMPRESSION EFFECTS ON BLOOD OF DOGS N66-17136

DINITROPHENOL-INDUCED HYPERTHERMIA UNDER ALTERED PARTIAL PRESSURES OF OXYGEN AND CARBON DIOXIDE N66-17150

SAWYER, C. H.
TWO YEARS OPERATIONAL EXPERIENCE OF TITAN II ICBM MEDICAL SUPPORT PERSONNEL IN PREVENTING ACCIDENTS FROM OPERATIONAL HAZARDS A66-80567

SCANO, A.
MORPHOLOGICAL CHARACTERISTICS AND FUNCTIONAL DATA IN PILOT TRAINEES, NOTING ANTHROPOMETRIC DATA AND VITAL CAPACITY, OXYGEN INTAKE, HEART RATE, ETC A66-19084

RESPIRATORY ASPECTS OF WALKING UNDER SUBGRAVITY CONDITIONS WITH VARIOUS GROUND FRICTION A66-80726

SCHANTZ, E. J.
PHYSICAL AND CHEMICAL PROPERTIES BY SEDIMENTATION AND SPECTRAL ANALYSIS FOR PURIFIED STAPHYLOCOCCAL ENTEROTOXIN B
AD-444380 N66-17644

SCHEELE, G.
REGENERATIVE PROCESSES AND ORGANIC CHANGES IN ANIMALS FOLLOWING SHOCK WAVES
DVL-481 N66-18131

SCHLOEDER, F. X.
DEFECT OF URINARY ACIDIFICATION DURING FASTING IN MAN A66-80631

SCHMITT, W. R.
NUTRITIONAL RESOURCES AND THEIR UTILIZATION ON EARTH WITH ASPECTS PERTINENT TO BIOASTRONAUTICS A66-80659

SCHOBER, H. A. W.
MEASUREMENT OF MUSCLE TREMOR FREQUENCY DISTRIBUTION ASSOCIATED WITH HAND-HELD FIELD GLASSES AND RESOLUTION EFFECTS A66-80576

SCHOENBERG, K. M.
IRRELEVANT INFORMATION EFFECTS ON SHORT-TERM RETENTION OF RELEVANT INFORMATION A66-80583

SCHRAER, H.
QUANTITATIVE RADIOGRAPHY OF BONE MASS AND DENSITY MEASURED BY X-RAYS N66-17668

SCHUKNECHT, H. F.
EFFECTS OF STREPTOMYCIN SULFATE IN TREATMENT OF ENDOLYMPHATIC HYDROPS - MENIERES DISEASE
NASA-CR-69862 N66-16446

SCHULZ, K. H.
BIOLOGICAL EFFECT OF AIR ELECTRICITY IN STATISTICAL BIOMETEOROLOGY, CLIMATIC CHAMBER EXPERIMENTS, AND THERAPY A66-80709

SCHUSTER, D. H.
COMPARISON OF TIME REQUIRED TO REMOVE AND REPLACE SPACECRAFT RADIOS UNDER SIMULATED WEIGHTLESSNESS ON DRY LAND AND UNDERWATER N66-17391

SCHWEIGER, E.
ROLE OF NUCLEUS IN CYTOPLASMIC DIURNAL RHYTHM OF GREEN ALGAE OXYGEN PRODUCTION A66-80533

SCHWEIGER, H. G.
ROLE OF NUCLEUS IN CYTOPLASMIC DIURNAL RHYTHM OF GREEN ALGAE OXYGEN PRODUCTION A66-80533

SEATON, J.
RELATIVE EFFECT OF HYPOXIA AND HYPERCAPNIA ON ADRENAL MEDULLARY SECRETION IN ANESTHETIZED DOGS A66-80640

SEEMAN, J. S.
MAINTENANCE OF SPACE VEHICLES DURING SHORT PERIODS OF SIMULATED WEIGHTLESSNESS BY WORKERS WEARING PRESSURIZED SUITS N66-17389

SELTZER, M. L.
REVISION IN CINEMA METHOD IMPROVES GEOGRAPHIC ORIENTATION IN AIRCRAFT PILOTS DURING SIMULATED LOW ALTITUDE FLIGHT
TR-751-5 N66-17587

SEN, A.
PHYSICAL AND CHEMICAL PROPERTIES OF ALPHA-LACTALBUMIN CRYSTALS PREPARED FROM GOAT MILK N66-16363

SETLIFF, J. A.
AMELIORATIVE VALUE OF CARBOHYDRATE AND ELECTROLYTES TO SURVIVAL OF FASTING HUMAN SUBJECTS IN ARCTIC A66-80613

SHAPIRO, D.
AUTOMATIC DATA PROCESSING IN PSYCHOPHYSIOLOGY - SYSTEM IN OPERATION A66-80638

SHAPIRO, W.
SCALENE AND STERNOMASTOID MUSCLE FUNCTION AND RESPIRATION IN HUMANS A66-80597

SHAW, D. B.
SYNCOPE INDUCED BY APPLICATION OF NEGATIVE PRESSURE TO LOWER BODY AND EFFECT ON LUNG CARBON MONOXIDE DIFFUSING CAPACITY A66-80565

SHEA, R. A.
UNAIDED VISUAL DETECTION OF TARGET SATELLITE FOR RENDEZVOUS PURPOSES, DISCUSSING INTENSITY AND ANGULAR VELOCITY IN STAR FIELD A66-18815

SHEPHERD, J. T.
CIRCULATORY EFFECTS OF CAROTID ARTERY STRETCH RECEPTORS STIMULATION IN MAN AT REST AND DURING

EXERCISE A66-80555

SHERIDAN, T. B.
FUNCTIONAL EXTENSION OF HUMAN HANDS THROUGH REMOTE CONTROL MACHINE
NASA-CR-69856 N66-16394

SHIMAZONO, Y.
EYE MOVEMENTS OF WAKING NORMAL SUBJECTS AND SCHIZOPHRENICS WITH CLOSED EYES
A66-80661

SHULER, R. L.
EFFECTS OF LIGHT INTENSITY AND CULTURE DENSITY ON ALGAL OXYGEN PRODUCTION
NRL-6331 N66-16214

SHVAREV, A. I.
TREATMENT OF SEVERE SPINAL FORM OF DECOMPRESSION SICKNESS N66-17161

SIDOROV, N. YA.
SUPERSATURATION OF ANIMALS AND HUMANS WITH GASES FOR DECOMPRESSION SICKNESS STUDIES
N66-17129

LONG TERM HEMODYNAMIC CHANGES IN DOGS UNDER HIGH PARTIAL PRESSURE OF OXYGEN N66-17146

SIEGEL, A. I.
ELECTROCUTANEOUS SIGNALS USED WITH AUDITORY AND VISUAL STIMULI TO PROVIDE ALERTING AND WARNING SIGNS FOR RECEPTION OF MILITARY INFORMATION
N66-16529

SILVERMAN, G. J.
RESISTANCE EVALUATION OF NATURAL SOURCE SPORE ISOLATES TO INACTIVATION BY THERMAL SHOCK
NASA-CR-70029 N66-16712

SIMINOFF, R.
FUNCTIONAL ORGANIZATION OF HAIRY SKIN IN RESPONSE TO SENSORY STIMULI A66-80662

SIMMONS, D. J.
DIURNAL VARIATION IN COLLAGEN RIBONUCLEIC ACID, DEOXYRIBONUCLEIC ACID, LACTATE, AND CALCIUM METABOLIC ACTIVITY OF RAT BONE TISSUE
A66-80574

SIROTIN, N.
POSSIBLE APPLICATION OF HYPOTHERMIA STATE FOR LONG PERIODS OF SPACE FLIGHT
JPRS-34093 N66-18036

SKRIVANOVA, J.
EFFECT OF ADRENALECTOMY ON ADAPTATION TO HYPOXIA IN RATS - CHANGES IN HAEMOGLOBIN CONCENTRATION AND OSMOTIC RESISTANCE OF ERYTHROCYTES IN PERIPHERAL BLOOD A66-80652

SKUJINS, J. J.
QUALITATIVE AND QUANTITATIVE TEST FOR ENZYME ACTIVITIES IN TERRESTRIAL SOIL ADAPTED TO MARS PROBE TELEMETRY PROCEDURES
NASA-CR-70058 N66-18163

SLUMP, P.
VITAMIN CONTENT, NUTRITIONAL VALUE, AND AMINO ACID COMPOSITION OF EGG WHITE AFTER LONG TERM STORAGE AT ROOM TEMPERATURE
R-2089 N66-18072

SMITH, D. A.
CORTICAL BONE VOLUME AND LUMBAR SPINE DENSITY RELATED TO AGING IN WOMEN - X-RAY MEASUREMENTS OF RELATIVE VERTEBRAL DENSITY N66-17669

MEASUREMENTS OF BONE VOLUME AND VERTEBRAL DENSITY
N66-17681

SMITH, F. H.
MAINTENANCE OF SPACE VEHICLES DURING SHORT PERIODS OF SIMULATED WEIGHTLESSNESS BY WORKERS WEARING PRESSURIZED SUITS N66-17389

SMITH, R. W., JR.
ULTRASONIC METHODS TO MEASURE BONE MASSES AND OTHER TISSUES IN SITU N66-17679

CORTICAL BONE THICKNESS MEASUREMENTS
N66-17686

SNOW, C. C.
SHOULDER SLOPE ANGLE OF FLYING PERSONNEL FOR IMPROVED SHOULDER HARNESS
AM-65-14 N66-17297

SOBIESK, E. J.
TWO YEARS OPERATIONAL EXPERIENCE OF TITAN II ICBM MEDICAL SUPPORT PERSONNEL IN PREVENTING ACCIDENTS FROM OPERATIONAL HAZARDS A66-80567

SOKOLIANSKYI, I. F.
OXYGEN TENSION CHANGES IN BRAIN TISSUE OF RATS SUBJECTED TO TRANSVERSE ACCELERATION
A66-80743

SOKOLOVA, M. M.
STUDY OF KIDNEY FUNCTION IN PERSONNEL OF SPACECRAFT **VOSKHOD** AFTER SPACE MISSION
A66-80746

SOLIDAY, S. M.
TASK LOADING EFFECTS ON PILOT PERFORMANCE DURING SIMULATED LOW ALTITUDE, HIGH SPEED, TERRAIN FOLLOWING MISSIONS N66-16540

SOLLBERGER, A.
BIOLOGICAL RHYTHM, ENVIRONMENTAL PERIODICITIES, AND MATHEMATICAL MODELS A66-80550

SONNAD, J.
CYTOPLASMIC ALTERATIONS AND FAT VACUOLE FORMATION IN PNEUMOCYTES OF GUINEA PIGS EXPOSED TO SEVERE HYPOXIA IN LOW PRESSURE CHAMBER
A66-18769

SONNENBURG, R. E.
FROG RESPIRATORY SYSTEM CILIARY MUCOUS TRANSPORT DECREMENT IN CLOSED CONTROLLED SUBMARINE CABIN ATMOSPHERE - ANIMAL STUDY
REPT.-443 N66-16990

SORENSON, J. A.
BONE MINERAL MEASUREMENTS BY PHOTON ABSORPTION WITH IMPROVED SCANNING DEVICE N66-17674

SOROKIN, P. A.
RESPIRATORY AND CIRCULATORY CHANGES IN DOGS DURING HIGH PRESSURE OXYGEN TOXICITY N66-17140

PATHOLOGICAL CHARACTERISTICS AND MECHANISM OF PULMONARY INVOLVEMENT IN HIGH PRESSURE OXYGEN TOXICITY IN GUINEA PIGS AND DOGS
N66-17141

HEART ACTIVITY DURING HIGH PRESSURE OXYGEN TOXICITY IN DOGS AND GUINEA PIGS
N66-17142

CIRCULATING BLOOD VOLUME CHANGES IN DOGS BREATHING OXYGEN UNDER PRESSURE N66-17143

SOROKINA, E. I.
PHYSIOLOGICAL REACTIONS OF HUMAN BODY TO TRANSVERSE ACCELERATION AND MEANS OF INCREASING RESISTANCE A66-80560

SPEHLMANN, R.
AVERAGED ELECTRICAL RESPONSES TO DIFFUSE AND TO PATTERNED LIGHT IN HUMAN A66-80671

STALEY, R. W.
PERFORMANCE OF EXPOSURE SYSTEM FOR SMALL ANIMALS AT ATMOSPHERIC AND REDUCED PRESSURES
A66-80625

STAMM, W.
NOREPINEPHRINE AND ANGIOTENSIN EFFECTS ON CORONARY FLOW AND MYOCARDIAL OXYGEN CONSUMPTION IN CAT A66-80635

STANKO, S. A.
MONOCHROMATIC RED, WHITE, GREEN, AND BLUE SOLAR LIGHT RADIATION EFFECT ON PLANT GROWTH, DEVELOPMENT, AND YIELD N66-16275

STEBBINS, P. L.
NEW THERAPY OF MOTION SICKNESS DECREASING GASTROINTESTINAL MOTILITY USING BETHANECHOL CHLORIDE A66-80572

STEGALL, H. F.
PHYSIOLOGICAL AND CLINICAL APPLICATIONS OF TRANSCUTANEOUS DOPPLER FLOWMETER APPLYING TRANSDUCER TO SKIN SURFACE OVER STRATEGIC SITES TO INDICATE BLOOD FLOW VELOCITY A66-80604

OPERATIONAL CAPABILITY AND PHYSIOLOGICAL AND CLINICAL APPLICATIONS OF TRANSCUTANEOUS ULTRASONIC BLOOD VELOCITY METER A66-80620

STEINMETZ, P. R.
INFLUENCE OF POSTURE AND DIURNAL RHYTHM ON RENAL EXCRETION OF ACID IN NORMAL MEN AND ADRENALECTOMIZED PATIENTS A66-80632

STEWART, R. J. C.
INTERACTION OF DIETARY PROTEIN AND CALCIUM ON GROWTH AND MAINTENANCE OF BONES OF YOUNG, ADULT, AND AGED RATS A66-80711

STEWART, W. K.
NEUROPHYSIOLOGICAL ASPECTS OF MANNED SPACE FLIGHT IN RELATION TO BEHAVIOR AND ILLUSIONS A66-80518

STINEBAUGH, B. J.
DEFECT OF URINARY ACIDIFICATION DURING FASTING IN MAN A66-80631

STOELTING, V.
CONVERSION OF GLUCOSIDE, ACETYL STROPHANTHIDIN, INDUCED VENTRICULAR TACHYCARDIA TO SINUS RHYTHM BY ETHYL ALCOHOL IN DOGS A66-80626

STRANDJORD, N. M.
IODINE 125 FOR USE IN BONE DENSITOMETRY N66-17677

ESTROGENS USED IN POSTMENOPAUSAL OSTEOPOROSIS TO RETARD LOSS IN BONE MASS N66-17682

STRATA, P.
BRAIN STEM MECHANISMS ANTAGONISTIC TO RETICULAR ACTIVATING SYSTEM A66-80693

CORRELATION OF ELECTROENCEPHALOGRAM WITH PUPIL AND EYELID BEHAVIOR, VISUAL ACCOMMODATION, AND OCULAR MOVEMENTS DURING SLEEP A66-80701

STREIMER, I.
SYSTEM COSTS AND PHARMACOLOGICAL TECHNIQUES AS FUNCTION OF EXERCISE PROGRAM DESIGNED TO MAINTAIN SPACE CREW PHYSICAL FITNESS A66-17658

OUTPUT CHARACTERISTICS, PERFORMANCE DECREMENT FROM WEARING PRESSURIZED SUITS, AND LIFE SUPPORT REQUIREMENTS IN SPACE ENVIRONMENT N66-17393

STROUD, C. W.
FEASIBILITY OF MULTIPLE BIO-ELECTRODE ARRAYS TO SENSOR GALVANIC SKIN RESPONSE SIGNALS DURING BODY MOVEMENT
NASA-CR-70532 N66-18068

STRUGHOLD, H.
HUMAN ADJUSTMENT TO SHIFT IN DAY-NIGHT CYCLE AND EFFECT OF SPACE FLIGHT ON SLEEP AND ACTIVITY CYCLES OF ASTRONAUTS A66-18582

STRUHWASSER, F.
DEMONSTRATION AND VARIATION OF CIRCADIAN RHYTHM OF ACTIVITY IN SINGLE NEURON OF SEA HARE A66-80548

STRUMZA, M. V.
CARBON DIOXIDE INDUCED MILD HYPOXIA, CORRECTION OF ALTERATIONS ON PERFORMANCE OF PSYCHOLOGIC AND PSYCHOMOTOR SYSTEMS A66-17661

STRYDOM, N. B.
ROLE OF PHYSICAL CONDITIONING IN ACCLIMATIZATION OF HUMAN SUBJECTS WORKING IN HUMID HEAT A66-80612

SUBAVIN, V. B.
PHYSIOLOGICAL REACTIONS OF HUMAN BODY TO TRANSVERSE ACCELERATION AND MEANS OF INCREASING RESISTANCE A66-80560

SULIMO-SAMUILLO, Z. K.
INCREASED CARBON DIOXIDE CONTENT EFFECT ON ANIMAL BREATHING IN GAS PRESSURE CHAMBER N66-17151

SUMMERS, L. G.
UNAIDED VISUAL DETECTION OF TARGET SATELLITE FOR RENDEZVOUS PURPOSES, DISCUSSING INTENSITY AND ANGULAR VELOCITY IN STAR FIELD A66-18815

SWEENEY, B. M.
BIOCHEMICAL FACTORS IN PHOTOSYNTHESIS RHYTHM IN ALGAE, GONYAULAX POLYEDRA A66-80532

SZEGI, J.
HYPOXEMIA EFFECT ON CORONARY CIRCULATION AND HEART MUSCLE METABOLISM A66-80729

SZKUTNIK, Z.
EFFECT OF LOW ENVIRONMENTAL TEMPERATURE ON CELLULAR BLOOD ELEMENTS AND WEIGHT GAIN IN RABBITS A66-80639

T

TAFT, R. A.
REGENERATIVE WASTE DISPOSAL SYSTEM SUPPLYING PHYSIOLOGICAL REQUIREMENTS FOR HUMANS IN SPACE CRAFT
PB-168787 N66-17429

TAKADA, H.
EXTRACTS OF CHLORELLA CELLS AS GROWTH FACTOR OF PROTOZOAN TETRAHYMENA PYRIFORMIS, A66-80735

TAKECHI, Y.
EXTRACTS OF CHLORELLA CELLS AS GROWTH FACTOR OF PROTOZOAN TETRAHYMENA PYRIFORMIS, A66-80735

TANAKA, T.
EYE MOVEMENTS OF WAKING NORMAL SUBJECTS AND SCHIZOPHRENICS WITH CLOSED EYES A66-80661

TARANOV, N. I.
CHANGES IN WORKING CAPACITY OF MUSCLE AFTER EXPOSURE OF MAN TO HYPOKINETIC CONDITIONS AND IMPORTANCE TO MANNED SPACE FLIGHT A66-80737

TAYLOR, C.
RESPONSE LATENCY CHANGES FOLLOWING SIGNAL PITCH SHIFTS, AND ADAPTATION-LEVEL THEORY EVALUATION
TR-36 N66-16510

TAYLOR, J. H.
PREFLIGHT, IN-FLIGHT, AND POSTFLIGHT TESTS OF VISUAL ACUITY AND CAPABILITY OF GEMINI V CREW MEMBERS N66-18011

TEMPEST, W.
MAGNITUDE ESTIMATION OF LOUDNESS, COMPARING EXPERIMENTAL RESULTS OF OBSERVERS ESTIMATES TO SONE SCALE A66-17732

TENNEY, S. M.
VENTILATORY RESPONSE TO HYPOXIA AND CARBON DIOXIDE FOLLOWING CARBON DIOXIDE EXPOSURE AND SODIUM BICARBONATE INGESTION IN MAN A66-80588

MECHANICAL AND CHEMICAL VENTILATORY STIMULUS INTERACTION AT LOW AND HIGH ALTITUDES IN MAN. A66-80589

NATURE OF VIBRATION HYPERVENTILATION IN MAN. A66-80590

TERASLINNA, P.
NOMOGRAM BY ASTRAND AND RYHMING AS PREDICTOR OF MAXIMUM OXYGEN INTAKE IN MAN DURING SUBMAXIMAL EXERCISE A66-80599

TERRANA, C.
RETINAL DETACHMENT IN PILOT INCURRED IN FLIGHT - CASE HISTORY A66-80728

TERSKOV, N. A.
MATHEMATICAL DESCRIPTION OF CONTINUOUS CULTURING OF MICROALGAE
JPRS-33831 N66-16315

THOMAS, F. H.
AVIATOR PERFORMANCE IN LIGHT WEAPONS HELICOPTER DURING NAP-OF-EARTH FLIGHT SIMULATED COMBAT MISSION N66-16533

THOMAS, J. J., JR.
TOXICITY INTERACTIONS OF HIGH PRESSURE OXYGEN AND X-RAYS ON DROSOPHILA A66-80732

THOMAS, R. G.
U SAF WHOLE BODY GAMMA SPECTROMETRY IN SUPPORT OF AIR FORCE AEROSPACE MISSION A66-17664

THOMPSON, R. C.
BIOLOGICAL RADIATION EXPOSURE STUDIES - LARGE PARTICLE INHALATION IN DOGS, INTRAGASTRIC AND SKIN EXPOSURE IN PIGS, INGESTED PARTICLES IN RATS, AND PLUTONIUM 28 INGESTION RATS
NASA-CR-70520 N66-18157

THOMPSON, W. T., JR.
SCALENE AND STERNOMASTOID MUSCLE FUNCTION AND RESPIRATION IN HUMANS A66-80597

THOMSON, M. L.
SYNCOPE INDUCED BY APPLICATION OF NEGATIVE PRESSURE TO LOWER BODY AND EFFECT ON LUNG CARBON MONOXIDE DIFFUSING CAPACITY A66-80565

PULMONARY DIFFUSING CAPACITY AND CARDIOVASCULAR RESPONSE IN MAN AS AFFECTED BY APPREHENSION A66-80602

DIURNAL VARIATION IN PULMONARY DIFFUSING CAPACITY OF MAN FOR CARBON MONOXIDE A66-80603

THORN, G. W.
CIRCADIAN CYCLE OF URINARY HYDROCORTISONE IN HEALTHY SUBJECTS AND PATIENTS WITH CUSHING*S SYNDROME A66-80733

TIKCHOMIROV, E. P.
PHYSIOLOGICAL REACTIONS OF HUMAN BODY TO TRANSVERSE ACCELERATION AND MEANS OF INCREASING RESISTANCE A66-80560

TITOVA, T. V.
CONFERENCE ON PROBLEMS OF USING DEEP HYPOTHERMIA IN TREATING CLINICAL DEATH
JPRS-33971 N66-18094

TOKIZANE, T.
HYPOTHALAMIC CONTROL OF SLEEP MECHANISM IN CATS A66-80696

TOOR, M.
CONCENTRATION AND DILUTION OF URINE IN PERMANENT INHABITANTS AT REST AND EXERCISE IN HOT ENVIRONMENT AS RELATED TO FLUID INTAKE A66-80685

TORPHY, D. E.
ORTHOSTATIC TOLERANCE AS AFFECTED BY WATER IMMERSION AND BED REST WITH OR WITHOUT PHYSICAL ACTIVITY A66-80558

TOUVIN, H.
GAMMA RADIATION EFFECTS ON CHIMAERAS OF FRUIT TREES
EUR-2546.F N66-18070

TRINCHER, K. S.
PHYSICAL PARAMETERS OF BIOLOGICAL LIVING SYSTEMS AND THEIR OPERATIONAL RELATIONSHIPS
JPRS-33830 N66-16397

TRITES, D. K.
SELF-REPORTED SYMPTOM INCIDENCE OF AIR TRAFFIC CONTROL PERSONNEL
AM-65-5 N66-16584

BIOMEDICAL SURVEY OF AIR TRAFFIC CONTROL FACILITIES - RELATIONSHIP OF EXPERIENCE AND AGING TO INCIDENCE OF STRESS SYMPTOMS
AM-65-6 N66-16669

TRUMBULL, R.
PHYSIOLOGICAL RESPONSES TO ANTIMOTION SICKNESS DRUGS - ANTIHISTAMINES, BELLADONNAS, AND PHENOTHIAZINES
NASA-CR-70175 N66-16971

TSITSIN, F. A.
PHYSICAL CHARACTERISTICS OF UNIVERSE AND BIOGENESIS OF EXTRATERRESTRIAL LIFE A66-80742

TUGGLE, F. D.
THEORY OF GROUP DECISION BEHAVIOR TESTED ON DYADS A66-80637

TURSKY, B.
AUTOMATIC DATA PROCESSING IN PSYCHOPHYSIOLOGY - SYSTEM IN OPERATION A66-80638

TURYGINA, A. V.
PRESSURE CHAMBER EXPERIMENTS FOR STUDYING CHANGES IN MOTOR, CADIOVASCULAR, RESPIRATORY, AND CENTRAL NERVOUS SYSTEMS DURING OXYGEN TOXICITY N66-17145

TYAN, M. L.
HOMOGRAFT RESPONSE AND HEMAGGLUTININ PRODUCTION BY SENSITIZED THYMECTOMIZED IRRADIATED ADULT MICE
USNROL-TR-920 N66-17065

V

VACCA, C.
EXPERIMENTS WITH RATS UNDER ANESTHESIA SUBJECTED TO ACCELERATION, NOTING ELECTROENCEPHALOGRAMS A66-19085

VARIATIONS OF P-WAVE OF ELECTROCARDIOGRAM IN RELATION TO CHANGES OF BODY POSITION A66-80713

COURSE OF P-WAVE IN RELATION TO BODY POSITION IN RABBIT - PRESSORECEPTOR EFFECT A66-80714

VACCA, L.
EXPERIMENTS WITH RATS UNDER ANESTHESIA SUBJECTED TO ACCELERATION, NOTING ELECTROENCEPHALOGRAMS A66-19085

COURSE OF P-WAVE IN RELATION TO BODY POSITION IN RABBIT - PRESSORECEPTOR EFFECT A66-80714

VAGNUCCI, A. I.
CIRCADIAN CYCLE OF URINARY HYDROCORTISONE IN HEALTHY SUBJECTS AND PATIENTS WITH CUSHING*S SYNDROME A66-80733

VALDIVIA, E.
CYTOPLASMIC ALTERATIONS AND FAT VACUOLE FORMATION IN PNEUMOCYTES OF GUINEA PIGS EXPOSED TO SEVERE HYPOXIA IN LOW PRESSURE CHAMBER A66-18769

VAN DE WOESTIJNE, K. P.
CHANGES IN ESOPHAGEAL PRESSURE TRANSMISSION DURING DETERMINATION OF LUNG COMPLIANCE IN DOGS A66-80593

VAN DER MIJLL DEKKER, L. P.
VITAMIN CONTENT, NUTRITIONAL VALUE, AND AMINO ACID COMPOSITION OF EGG WHITE AFTER LONG TERM STORAGE AT ROOM TEMPERATURE
R-2089 N66-18072

VAN HOUT, A. M. J.
FUNDAMENTAL RESPONSE CURVES OF NORMAL AND DEUTERANOMALOUS OBSERVER DERIVED FROM CHROMATIC ADAPTATION DATA A66-80680

VASILEVA, V. F.
STUDY OF KIDNEY FUNCTION IN PERSONNEL OF SPACECRAFT **VOSKHOD** AFTER SPACE MISSION A66-80746

VAULT, K. TE.
ELECTRIC SPARK STIMULATION OF SKIN FOR STUDY OF SINGLE SENSORY UNITS
AD-624848 N66-17120

VENTTSEL, M. D.
USE OF METHODS OF CORRELATION ANALYSIS FOR STUDY OF TELEMETRIC DATA OF CARDIOVASCULAR SYSTEM RESPONSES DURING FLIGHT OF VOSKHOD I SPACECRAFT
A66-80745

VINOKUROV, B. A.
CONDITIONED RESPONSE BEHAVIOR OF DOGS UNDER ACUTE HYPOXIA N66-17149

VIRGILI, R.
ELECTROENCEPHALOGRAMS OF EXPERIENCED PILOTS, PILOT CANDIDATES, AND NON-PILOTS A66-80719

VOGT, F. B.
EFFECT OF WEIGHTLESSNESS AND IMMOBILIZATION ON BONE DEMINERALIZATION OF PRIMARY AND BACKUP GEMINI V CREW USING RADIOGRAPHIC BONE DENSITOMETRY N66-18014

VOIGT, D.
SERUM IRON IN ATHLETES AND UNTRAINED SUBJECTS AFTER PHYSICAL EXERCISE A66-80660

VOMASKE, R. F.
POWERED TRIM CHANGES AFFECTING PILOT DURING SIMULATED LANDING FOR SHORT TAKE OFF AND LANDING AIRCRAFT
NASA-TN-D-3246 N66-16550

VON GIERKE, H. E.
L F AND INFRASONIC NOISE EFFECTS ON MANS CARDIAC RHYTHM, HEARING, VISION, MOTOR CONTROL, SPATIAL ORIENTATION, SPEECH AND SUBJECTIVE TOLERANCE
A66-17656

VON RAHDEN, M.
ROLE OF PHYSICAL CONDITIONING IN ACCLIMATIZATION OF HUMAN SUBJECTS WORKING IN HUMID HEAT
A66-80612

VOS, O.
RADIATION CHIMERA MORTALITY RATE IN RELATION TO NUMBER OF TRANSPLANTED BONE MARROW AND LYMPH NODE CELLS
MBL/1965/23 N66-17484

VOSE, G. P.
FACTORS AFFECTING RADIOGRAPHIC DENSITOMETRY OF LUMBAR SPINE AND FEMORAL NECK N66-17671

EFFECT OF WEIGHTLESSNESS AND IMMOBILIZATION ON BONE DEMINERALIZATION OF PRIMARY AND BACKUP GEMINI V CREW USING RADIOGRAPHIC BONE DENSITOMETRY N66-18014

VOSKRESENSKII, A. D.
USE OF METHODS OF CORRELATION ANALYSIS FOR STUDY OF TELEMETRIC DATA OF CARDIOVASCULAR SYSTEM RESPONSES DURING FLIGHT OF VOSKHOD I SPACECRAFT
A66-80745

W

WAGMAN, J.
PHYSICAL AND CHEMICAL PROPERTIES BY SEDIMENTATION AND SPECTRAL ANALYSIS FOR PURIFIED STAPHYLOCOCCAL ENTEROTOXIN B
AD-444380 N66-17644

WAGNER, B.
COMPARISON OF CORTICAL THICKNESS AND RADIOGRAPHIC MICRODENSITOMETER MEASUREMENTS IN DETERMINING BONE LOSS N66-17672

WAHLSTROM, G.
SHIFT IN CIRCADIAN RHYTHM PHASES IN CANARY, SERINUS CANARIUS, IN SELF-SELECTION, IMPOSED DARKNESS, AND AFTER ADMINISTRATION OF RESERPINE AND TRIIODOTHYRONINE A66-80543

WALRAVEN, P. L.
FUNDAMENTAL RESPONSE CURVES OF NORMAL AND DEUTERANOMALOUS OBSERVER DERIVED FROM CHROMATIC ADAPTATION DATA A66-80680

WALSH, J.
THALAMIC TRANSMISSION DURING SLEEP AND WAKEFULNESS IN CATS A66-80705

WALTER, D. O.
HUMAN ELECTROENCEPHALOGRAM GENERATOR SPECTRAL ANALYSIS IN POSTERIOR CEREBRAL REGIONS
NASA-CR-57050 N66-18389

WARD, M. W.
HEAT, FOOD INTAKE, AND AGING EFFECTS ON THYROID FUNCTION OF MALE RATS A66-80619

WEBB, W. B.
INFANTILE TREADMILL EXPERIENCE EFFECT ON BODY WEIGHT AND RESISTANCE TO EXHAUSTION IN RAT
A66-17460

SLEEP DEPRIVATION AND MICROSLEEP RESPONSES IN RAT
A66-80522

WEISS, H. S.
AGE DEPENDENCE OF RESISTANCE OF CHICKENS TO 100 PERCENT OXYGEN AT ONE ATM / OAP/, NOTING DELAYED MORTALITY IN ADULT BIRDS A66-17458

EXPERIMENT TO DETERMINE CHICKEN REACTION TO 100 PERCENT OXYGEN AT ATMOSPHERIC PRESSURE
NASA-CR-60380 N66-18391

WEISSBLUTH, M.
ENZYME SUBSTRATE - RNA-RIBONUCLEASE AND SUCCINATE-CYTOCHROME C REDUCTASE - REACTIONS IN HIGH MAGNETIC FIELDS A66-80645

WELTMAN, A. S.
ENDOCRINE SYSTEM OF MALE AND FEMALE RATS AS AFFECTED BY VIBRATIONAL STRESS A66-80566

WENDROW, B.
SYSTEM COSTS AND PHARMACOLOGICAL TECHNIQUES AS FUNCTION OF EXERCISE PROGRAM DESIGNED TO MAINTAIN SPACE CREW PHYSICAL FITNESS A66-17658

WEVER, R.
PENDULUM VERSUS RELAXATION OSCILLATION IN BIOLOGICAL RHYTHM A66-80516

MATHEMATICAL MODEL FOR CIRCADIAN RHYTHMS
A66-80517

WEYBREW, B. B.
PERIPHERAL AUTONOMIC NERVOUS SYSTEM INDICES VALIDITY STUDY FOR PREDICTING INDIVIDUAL ADJUSTMENT RESPONSE TO ENVIRONMENTAL STRESS
AD-624783 N66-16991

WHALEN, R. E.
PROTECTIVE EFFECT OF HYPERBARIC OXYGENATION IN CEREBRAL ANOXIA IN DOGS A66-80556

WHEDON, G. D.
DETERMINING THICKNESS AND MINERAL CONTENT IN VERTEBRA AND OTHER BONES BY X-RAY AND OTHER DENSITOMETRY - APPLICATION OF TECHNIQUES TO HUMAN STUDIES
NASA-SP-64 N66-17666

WHERRY, R. J., JR.
PHYSIOLOGICAL RESPONSES TO ANTIMOTION SICKNESS DRUGS - ANTIHISTAMINES, BELLADONNAS, AND PHENOTHIAZINES
NASA-CR-70175 N66-16971

WHITE, R. M.
BODY MEASUREMENTS OF PILOTS MADE DURING ANTHROPOMETRIC SURVEY - APPLICATIONS TO EQUIPMENT DESIGN N66-16534

WHITFIELD, J. F.
RELATIONS BETWEEN LACTATE PRODUCTION, RESPIRATION, AND NUCLEAR DAMAGE IN IRRADIATED RAT THYMOCYTES
EUR-2623.E N66-18146

WHITTENBURG, J. A.
FIELD CRITERION TEST TO ASSESS SCANNING AND TARGET IDENTIFICATION SKILLS OF COMBAT ARMS OFFICERS

N66-16530

WILKINS, M. B.
EFFECT OF TEMPERATURE VARIATIONS ON BIOLOGICAL CLOCKS IN PLANTS AND ANIMALS A66-80530

WILL, D. H.
SITE OF PULMONARY VASOMOTOR ACTIVITY DURING HYPOXIA OR SEROTONIN ADMINISTRATION IN DOGS A66-80554

WILLIAMS, C. G.
ROLE OF PHYSICAL CONDITIONING IN ACCLIMATIZATION OF HUMAN SUBJECTS WORKING IN HUMID HEAT A66-80612

WILSON, C. L.
SOVIET HIGH ALTITUDE PRESSURE-SUIT DEVELOPMENT, TESTING AND USE, 1934-1955 A66-17666

WILSON, I. D.
TIME FOR ACCLIMATIZATION OF HEALTHY YOUNG EXERCISING MEN TO HOT, WET ENVIRONMENT A66-80616

WIRTA, R. W.
MYOELECTRIC POTENTIAL RESPONSE AND FORCE OF MUSCLE CONTRACTION
REPT.-2386 N66-16308

WIRZ, E.
NOREPINEPHRINE AND ANGIOTENSIN EFFECTS ON CORONARY FLOW AND MYOCARDIAL OXYGEN CONSUMPTION IN CAT A66-80635

WOLANSKI, N.
MINERAL CONTENT OF BONE CORTEX RELATED TO THICKNESS IN SECOND METACARPAL AS A FUNCTION OF AGE AND SEX N66-17673

WOLF, E.
EXCITATION OF PERIPHERAL RETINA WITH COINCIDENT AND DISPARATE TEST FIELDS A66-80575

WOLF, R. L.
PRESSURIZED SUITS USED IN WATER IMMERSION STUDIES WHICH SIMULATE ZERO GRAVITY EFFECTS N66-17390

WOLFSON, A.
CIRCADIAN RHYTHM AND PHOTOPERIODIC REGULATION OF ANNUAL REPRODUCTIVE CYCLE IN BIRDS A66-80544

WOLFSON, R. J.
PERFORMANCE OF IMPLANTED ELECTRODE FOR ELECTRO-NYSTAGMOGRAPHY IN SQUIRREL MONKEY A66-80621

WOOD, C. D.
HUMAN CENTRIFUGE STUDIES OF RELATIVE EFFECTIVENESS OF ANTIMOTION SICKNESS DRUGS, INCLUDING HYOSCINE D-AMPHETAMINE, MECLIZINE, CHLORPROMAZINE, THIETHYLPERAZINE, PROCHLORPERAZINE, AND TRIMETHOBENZAMIDE A66-80573

PHYSIOLOGICAL RESPONSES TO ANTIMOTION SICKNESS DRUGS - ANTIHISTAMINES, BELLADONNAS, AND PHENOTHIAZINES
NASA-CR-70175 N66-16971

WOODS, A. R.
HELICOPTER RECONNAISSANCE TACTICS FOR AIR CAVALRY UNITS DURING WINTER ENVIRONMENT N66-16531

WORTZ, E. C.
METABOLIC RATES IN PRESSURIZED PRESSURE SUIT, AFFECTING HEAT BALANCE OF SUBJECTS METABOLIC HEAT WITH HEAT REMOVED BY ENVIRONMENTAL CONTROL A66-17657

WRIGHT, H.
PRECISION OF COLOR DIFFERENCES DERIVED FROM MULTIDIMENSIONAL SCALING EXPERIMENT A66-80672

WRIGHT, P. E.
DRINKING WATER RECLAMATION FROM URINE BY THERMOELECTRICS, INCLUDING OPERATIONAL THEORY AND DATA FOR WORKING MODELS A66-18730

WRIGHT, R. A.
AGE DEPENDENCE OF RESISTANCE OF CHICKENS TO 100 PERCENT OXYGEN AT ONE ATM / OAP/, NOTING DELAYED MORTALITY IN ADULT BIRDS A66-17458

EXPERIMENT TO DETERMINE CHICKEN REACTION TO 100 PERCENT OXYGEN AT ATMOSPHERIC PRESSURE
NASA-CR-60380 N66-18391

WRIGHT, R. H.
SEAT BELT INJURIES IN AIRCRAFT ACCIDENTS - CASE HISTORIES FOR EVIDENCE OF SYNDROME A66-80633

CONTROL ANALOG VERTICAL ATTITUDE INDICATOR AND VTOL FLIGHT DISPLAY FOR HELICOPTER PILOT TRAINING N66-16536

MISSION, PERSONNEL, AND HARDWARE DEMANDS OF LOW ALTITUDE NAVIGATION N66-16541

WUNSCHE, O.
REGENERATIVE PROCESSES AND ORGANIC CHANGES IN ANIMALS FOLLOWING SHOCK WAVES
DVL-481 N66-18131

WURSTER, R. D.
CUTANEOUS VASCULAR AND SWEATING RESPONSES TO TYMPANIC AND SKIN TEMPERATURES IN NUDE SUBJECTS A66-80609

WUSCHECH, H.
SERUM IRON IN ATHLETES AND UNTRAINED SUBJECTS AFTER PHYSICAL EXERCISE A66-80660

WYNDHAM, C. H.
ROLE OF PHYSICAL CONDITIONING IN ACCLIMATIZATION OF HUMAN SUBJECTS WORKING IN HUMID HEAT A66-80612

Y

YANKELEVICH, B. M.
LOGIC DIAGRAMS OF PILOT ACTION IN EMERGENCY SITUATION
JPRS-34200 N66-17638

YARNOLD, K. W.
SYSTEMS ANALYSIS NAVY ANTIAIRCRAFT WARFARE TRAINING PROGRAM
NAVTRADEVCEN-1574-1 N66-16640

YOUDALE, T.
RELATIONS BETWEEN LACTATE PRODUCTION, RESPIRATION, AND NUCLEAR DAMAGE IN IRRADIATED RAT THYMOCYTES
EUR-2623.E N66-18146

YUDAYEV, N. A.
REPORTS FROM U.S.S.R. ACADEMY OF MEDICAL SCIENCES ON CORTICOSTEROIDS, STEROID HORMONES, DIABETES, THYROID GLAND AND PANCREAS DISEASES, AUTORADIOGRAPHY, AND ELECTROCARDIOGRAPHY
JPRS-33643 N66-16244

YUROVA, K. S.
PHYSIOLOGICAL RESPONSES IN RABBITS TO ARTIFICIAL EMBOLISM DUE TO INJECTIONS OF CARBON DIOXIDE, OXYGEN, AIR, AND HELIUM-OXYGEN MIXTURE N66-17134

INCREASED TOLERANCE TO AIR EMBOLISM IN ANIMALS BY REPEATED INJECTIONS N66-17135

TEMPERATURE EFFECTS ON DECOMPRESSION SICKNESS AND AIR EMBOLISM IN ANIMALS N66-17137

CIRCULATORY AND RESPIRATORY REACTIONS IN DOGS TO DECOMPRESSION AND ARTIFICIAL AIR EMBOLISM N66-17138

Z

ZAGRYADSKII, V. P.
INCREASED CARBON DIOXIDE CONTENT EFFECT ON ANIMAL BREATHING IN GAS PRESSURE CHAMBER N66-17151

ZALTSMAN, G. L.
PERMISSIBLE SUPERSATURATION VALUE AFTER INHALATION OF AIR-HELIUM-OXYGEN MIXTURES AND DECOMPRESSION SICKNESS SYMPTOMS N66-17130

PRESSURE CHAMBER EXPERIMENTS FOR STUDYING CHANGES IN MOTOR, CADIOVASCULAR, RESPIRATORY, AND CENTRAL NERVOUS SYSTEMS DURING OXYGEN TOXICITY N66-17145

TOXIC EFFECT OF HIGH PARTIAL OXYGEN PRESSURE NOTED IN CONSTRICTION OF PERIPHERAL VISUAL FIELD N66-17162

ZANCHETTI, A.
BEHAVIOR REFLEX REGULATION OF DECORTICATE CAT, NEURAL MECHANISMS RESPONSIBLE FOR DEEP SLEEP, AND REFLEXES IN CIRCULATION REGULATION DURING SLEEP AFOSR-65-1579 N66-16469

ZAZO, F.
USEFULNESS AND LIMITATIONS OF NELSON TEST METHOD FOR SYPHILIS IN DETERMINING FLIGHT FITNESS IN PILOTS A66-80720

ZENZ, C.
HEART RATE, VENTILATORY VOLUME, OXYGEN COMSUMPTION AND ENERGY EXPENDITURE OF MEN BEFORE, DURING, AND AFTER CLIMBING A66-80687

ZHELUDKOVA, T. N.
INCREASED CARBON DIOXIDE CONTENT EFFECT ON ANIMAL BREATHING IN GAS PRESSURE CHAMBER N66-17151

ZIEDMAN, K.
UNAIDED VISUAL DETECTION OF TARGET SATELLITE FOR RENDEZVOUS PURPOSES, DISCUSSING INTENSITY AND ANGULAR VELOCITY IN STAR FIELD A66-18815

ZIGLER, M. J.
EXCITATION OF PERIPHERAL RETINA WITH COINCIDENT AND DISPARATE TEST FIELDS A66-80575

ZINOVEVA, I. D.
PERMISSIBLE SUPERSATURATION VALUE AFTER INHALATION OF AIR-HELIUM-OXYGEN MIXTURES AND DECOMPRESSION SICKNESS SYMPTOMS N66-17130

PRESSURE CHAMBER EXPERIMENTS FOR STUDYING CHANGES IN MOTOR, CADIOVASCULAR, RESPIRATORY, AND CENTRAL NERVOUS SYSTEMS DURING OXYGEN TOXICITY N66-17145

TOXIC EFFECT OF HIGH PARTIAL OXYGEN PRESSURE NOTED IN CONSTRICTION OF PERIPHERAL VISUAL FIELD N66-17162

ZOLOTOV, P. A.
ECOLOGICAL AND SEASONAL VARIATIONS OF SKIN TEMPERATURE IN MAN A66-80736

ZVORYKIN, V. N.
HIGHER NERVOUS ACTIVITY CHANGES IN STIMULUS RESPONSE FOR DOGS UNDER RAREFIED AIR AND ANOXIC CONDITIONS N66-17148

EFFECT OF GAS EXPANSION IN GASTROINTESTINAL TRACT DURING BAROMETRIC PRESSURE CHANGES ON RESPIRATORY AND CARDIOVASCULAR REFLEXES N66-17159

Collections of NASA Documents

NASA is depositing its technical documents and bibliographic tools in eleven Federal Regional Technical Report Centers. Each center, located in one of the organizations listed below, is prepared to furnish the general public such services as personal reference, inter-library loans, photocopy service, and assistance in obtaining retention copies of NASA documents.

California: University of California, Berkeley
Colorado: University of Colorado, Boulder
District of Columbia: Library of Congress
Georgia: Georgia Institute of Technology, Atlanta
Illinois: The John Crerar Library, Chicago
Massachusetts: Massachusetts Institute of Technology, Cambridge
Missouri: Linda Hall Library, Kansas City
New York: Columbia University, New York
Pennsylvania: Carnegie Library of Pittsburgh
Texas: Southern Methodist University, Dallas
Washington: University of Washington, Seattle

NASA publications are currently being forwarded to the public libraries in the cities listed below:

Alabama: Birmingham
Alaska: Anchorage
Arizona: Phoenix
Arkansas: Little Rock
California: Los Angeles, Oakland, San Diego, and San Francisco
Colorado: Denver
Connecticut: Hartford and Bridgeport
Delaware: Wilmington
Florida: Miami
Louisiana: New Orleans
Massachusetts: Boston
Michigan: Detroit
Minnesota: St. Paul
Missouri: Kansas City and St. Louis
New Jersey: Trenton
New York: Brooklyn, Buffalo, and Rochester
North Carolina: Charlotte
Ohio: Cleveland, Cincinnati, Dayton, and Toledo
Oklahoma: Oklahoma City
Pennsylvania: Pittsburgh
Tennessee: Memphis
Texas: Fort Worth and San Antonio
Washington: Seattle
Wisconsin: Milwaukee

In addition, NASA regularly sends its publications to the Enoch Pratt Free Library located in Baltimore, Maryland.

An extensive collection of NASA and NASA-sponsored scientific and technical publications available to the public for reference purposes is maintained at the Technical Information Service, American Institute of Aeronautics and Astronautics, 750 Third Avenue, New York, New York 10017.

"The aeronautical and space activities of the United States shall be conducted so as to contribute . . . to the expansion of human knowledge of phenomena in the atmosphere and space. The Administration shall provide for the widest practicable and appropriate dissemination of information concerning its activities and the results thereof."

—NATIONAL AERONAUTICS AND SPACE ACT OF 1958

NASA SCIENTIFIC AND TECHNICAL PUBLICATIONS

TECHNICAL REPORTS: Scientific and technical information considered important, complete, and a lasting contribution to existing knowledge.

TECHNICAL NOTES: Information less broad in scope but nevertheless of importance as a contribution to existing knowledge.

TECHNICAL MEMORANDUMS: Information receiving limited distribution because of preliminary data, security classification, or other reasons.

CONTRACTOR REPORTS: Technical information generated in connection with a NASA contract or grant and released under NASA auspices.

TECHNICAL TRANSLATIONS: Information published in a foreign language considered to merit NASA distribution in English.

SPECIAL PUBLICATIONS: Information derived from or of value to NASA activities. Publications include conference proceedings, monographs, data compilations, handbooks, sourcebooks, and special bibliographies.

TECHNOLOGY UTILIZATION PUBLICATIONS: Information on technology used by NASA that may be of particular interest in commercial and other nonaerospace applications. Publications include Tech Briefs; Technology Utilization Reports and Notes; and Technology Surveys.

Details on the availability of these publications may be obtained from:

SCIENTIFIC AND TECHNICAL INFORMATION DIVISION

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

Washington, D.C. 20546