

COLOR PROJECTION SLIDES 35 mm

PHOTOMICROGRAPHS

Our new Color Slide Series are designed for modern teaching. They cover all requirements for teaching in secondary schools, high schools and colleges as well as in elementary schools. These visual aids will be invaluable in preparing students for the recognised examinations.

The series of human biology are of great value in the training of nurses, medical technicians and for the students of physiotherapy and physical education. The study of the human body is the underlying theme of the series which is usually the most important section of the school biology syllabus. This bias is also emphasised in the selection of anatomical and histological materials.

The series of 35 mm slides consist of color pictures for histology and anatomy of the human body, color diagrams to illustrate the anatomical structures, color photomicrographs, human photographs, electron and scanning electron micrographs, X-ray photographs, drawings, diagrams, tables etc.

The color pictures and diagrams have been prepared by university illustrators specialising in this field. In order to obtain maximum quality most of the slides delivered are ORIGINAL EXPOSURES, i.e. they are individually photographed from the specimen.

The LIEDER series of projection slides will offer a complete range of slides covering all respects of school teaching in biology, physics and chemistry.

LIEDER Color Photomicrographs for projection (on 35 mm film) are taken from selected prepared microscope slides. They immediately show, on the screen, the details of the specimen required for demonstration at the most suitable magnification. The student subsequently find it easier to locate the relevant part of a prepared slide under the microscope.

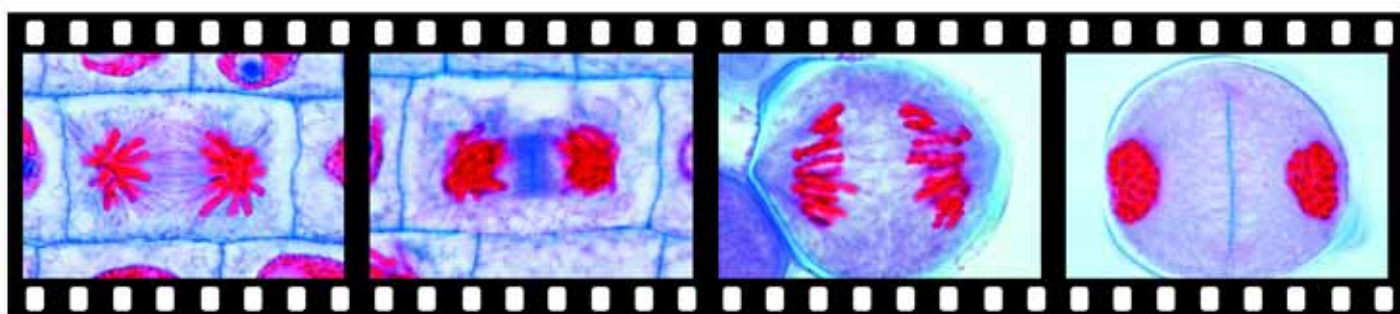
In order to obtain maximum quality all the transparencies delivered are ORIGINAL EXPOSURES i.e. each LIEDER color photomicrograph is individually photographed from the specimen. Consequently, there is no loss of quality which could arise from a copying process.

High quality photomicrographs can only be made from excellent, carefully selected microscope specimens. Every specimen used in the production of our photomicrographs has been either specially made or selected from many hundreds of preparations.

Similar high standards must, of course, be applied to the selection and use of the photomicrographic apparatus. Our color photomicrographs are taken through microscopes with automatic cameras of the most advanced technique. These instruments are equipped with highly corrected optical systems, including flat field apochromatic objectives.

LIEDER color photomicrographs are of high definition and clarity, coupled with color reproduction which has resulted in transparency slides of unsurpassed quality. They enable the maximum amount of information to be illustrated in such a manner that it can be readily appreciated by the student.

LIEDER color slides and photomicrographs are mounted between glass in solid dust-proof frames size 50 x 50 mm (2 x 2"). They are available in complete sets and series or as individual slides.





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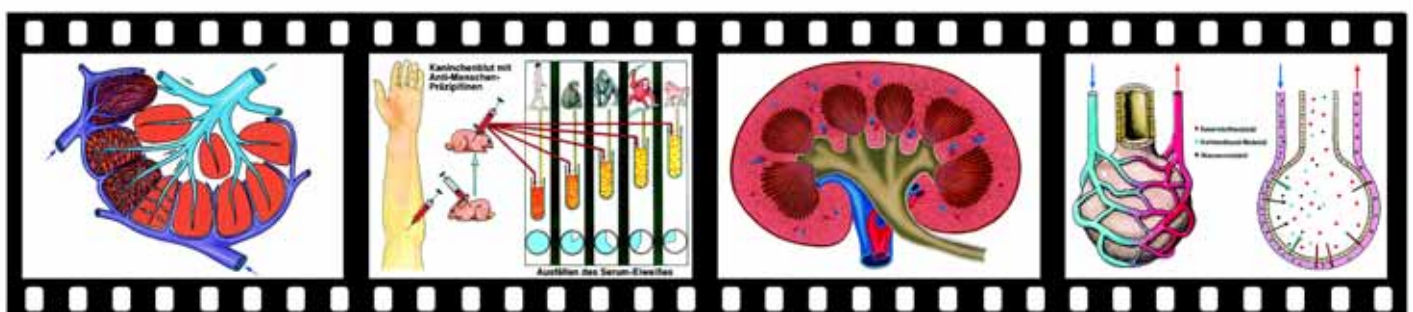
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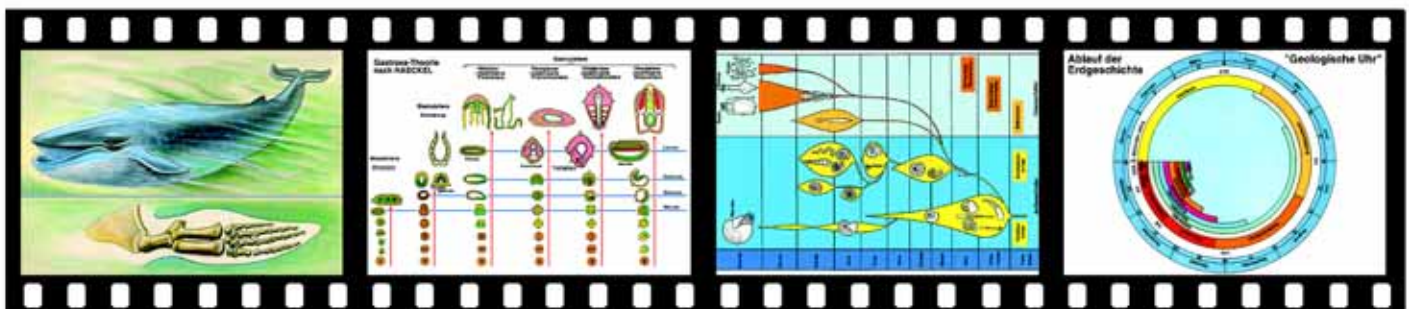
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HUMAN BIOLOGY

No. 760. The Human System of Movement, Part I: Connective and Supporting Tissues.

Compilation: Prof. Walter Mergenthaler. 19 Projection Slides

1. Embryonic connective tissue 2. Loose (areolar) connective tissue 3. Dense connective tissue, tendon I.s. 4. Hyaline cartilage 5. Human costal cartilage 6. Yellow elastic cartilage 7. Fibrous cartilage from an intervertebral disc 8. Bone cells with processes 9. Human tibia, t.s. general structure 10. Bone tissue, t.s. systems of lamellae 11. Bone tissue, I.s. Haversian canals 12. Haversian system, t.s. 13. Fine structure of bone, diagram 14. Finger of human embryo I.s. 15. Phalanx of human embryo I.s. 16. Development of bone. Zone of calcification, I.s. 17. Development of bone. Zone of ossification, t.s. 18. Osteoblasts (bone forming cells) 19. Red bone marrow with giant cells

No. 770. The Human System of Movement, Part II: The Skeleton.

Compilation: Prof. Walter Mergenthaler. 20 Projection Slides

1. The human skeleton, front view 2. The human skeleton, rear view 3. Sub-division of the skeleton into its functional parts 4. Joints: diagram, hinge, ball-and-socket joint 5. Finger joint, I.s. 6. Spinal column, cervical and thoracic vertebrae 7. Lumbar vertebrae, sacrum and coccyx 8. Articulations of the skull: skull, atlas, axis 9. Thorax and shoulder girdle, front and back view 10. Structure of a long bone 11. Skeleton of the arm, pronation and supination 12. The elbow joint, surface view and I.s. 13. The skeleton of the hand 14. The pelvic girdle with and without its ligaments 15. The knee joint: long. section, front view, back view, menisci 16. The skeleton of the foot: side view, frontal view, ankle joint 17. The skull: anterior and lateral view 18. Skull with separated bones 19. X-ray photograph of a dislocation 20. X-ray photograph of a fracture

No. 780. The Human System of Movement, Part III: The Muscular System.

Compilation: Prof. Walter Mergenthaler. 23 Projection Slides

1. Human body showing the skeletal muscles, front and rear views 2. The structure of a skeletal muscle, diagram 3. Skeletal (striated) muscle, t.s. 4. Skeletal muscle, I.s. low magnification 5. Skeletal muscle fibres, I.s. high magnification 6. Skeletal muscle fibres, t.s. high magnification 7. Capillaries and arteries of a skeletal muscle 8. The sensory and motor innervation of a muscle 9. Motor end plates on muscle fibres 10. Muscle with muscle spindle, t.s. 11. The muscles of the head and the neck, front and side view 12. The muscles of the trunk, front view 13. The superficial muscles of the back 14. The deeper muscles of the back 15. The muscles of the shoulder 16. The muscles of the arm 17. Pronating and supinating muscles of the forearm 18. The muscles of the hand 19. The muscles of the pelvis 20. The muscles of the leg 21. Flexors and extensors of the leg 22. The muscles of the lower leg and of the foot 23. Example of a complex muscular action

No. 810. The Human Digestive System, Part I: Mouth, Pharynx, Stomach.

Compilation: Prof. Walter Mergenthaler. 24 Projection Slides

1. The deciduous and the permanent set of teeth 2. The types of teeth: incisor, canine, premolar 3. Incisor tooth in the alveolus, I.s. 4. Jaw with dental root, t.s. 5. Head of pig embryo with dental primordia 6. Development of tooth: Dental lamina and early tooth primordium 7. Ditto: Older tooth primordium 8. Ditto: Dental sack with later tooth differentiation 9. Ditto: Apical part of crown 10. Ditto: Detail with ameloblasts, enamel, dentin etc. 11. Human tongue, t.s. 12. The position of the salivary glands in the head 13. Lobules of salivary gland 14. Human submaxillary gland, t.s. 15. Human submaxillary gland, higher magnification 16. The structure of the salivary glands, diagram 17. Human sublingual gland, t.s. 18. Human parotid gland, t.s. 19. Human esophagus, t.s., low magnification 20. Human esophagus, t.s., high magnification 21. Human stomach, I.s. 22. Wall of the stomach, t.s. 23. Gastric mucosa, I.s. 24. Gastric glands, I.s.

No. 820. The Human Digestive System, Part II: Intestine.

Compilation: Prof. Walter Mergenthaler. 16 Projection Slides

1. Position and fixation of the human abdominal digestive organs. 2. Small intestine of a newborn, t.s. total view 3. Small intestine, t.s., detail 4. Human duodenum, I.s. 5. Duodenal fold, I.s. 6. Duodenal wall, I.s. 7. Human jejunum, I.s. 8. Human jejunum, I.s. with villi 9. Intestinal epithelium with goblet cells 10. Intestinal loop with blood vessels 11. Small intestine with injected blood vessels, t.s. 12. Intestinal villi with injected blood vessels, surface view 13. Structure of an intestinal villus, diagram 14. Human colon, I.s. 15. Tubulous glands of the colon, I.s. 16. Tubulous glands of the colon, t.s.

No. 830. The Human Digestive System, Part III: Liver and Pancreas.

Compilation: Prof. Walter Mergenthaler. 14 Projection Slides

1. Liver and pancreas, surface view 2. Liver of pig, t.s. low magnification 3. General structure of a liver lobule, diagram 4. Structure of a hepatic cord, diagram 5. Vascular systems of a liver lobule, diagram 6. Capillaries of the liver, central vein, hepatic vein, diagram 7. The venous system of the liver, diagram 8. Liver of pig, higher magnification 9. Liver lobule, t.s. showing arrangement of the hepatic cords 10. Liver lobule, t.s. with injected bile canaliculi 11. Liver lobule, t.s. with injected blood vessels 12. Glisson's triangle; vein, artery, bile duct 13. Liver cells with glycogen granules 14. Human pancreas, t.s.

No. 840. The Human Excretory System

Compilation: Prof. Walter Mergenthaler. 12 Projection Slides

1. The urinary organs: situs 2. Kidney, I.s., diagram 3. Kidney from human embryo, I.s. 4. The blood vessels of the kidney, diagram 5. Human kidney, I.s., low magnification 6. Human renal cortex, I.s., higher magnification 7. Renal corpuscle (Malpighian corpuscle) 8. Renal cortex, I.s. with injected blood vessels 9. Human renal medulla, I.s. 10. Nephron and glomerulus, diagram 11. Human ureter, t.s. 12. Human urinary bladder, t.s.

No. 743. The Human Respiratory System.

Compilation: OStR Michael Duenckmann. 38 Projection Slides

1. The human respiratory organs 2. Sagittal section through head and neck, air passages 3. Head with nasal cavities 4. Nasal septum and hard palate of human 5. Swallowing and breathing 6. The larynx 7. Function of arytenoid cartilages, glottis and vocal cords 8. Human trachea, I.s. 9. Ciliated epithelium of the trachea, detail 10. Ciliated epithelial cells, electron micrograph 11. Position of lungs in the thorax 12. Inner lining of thorax 13. X-ray of thorax, inspired and expired position 14. Thorax showing inspiration and expiration, I.s. 15. Function of intercostal muscles 16. Detailed structure of the lung 17. Human pulmonary tissue 18. Human lung, t.s. bronchioles and alveoli 19. Lung, injected to show the blood vessels 20. The alveolar wall, electron micrograph 21. Lung, t.s. stained for elastic fibres 22. Comparison of inspired and expired air 23. Diagram of gaseous exchange in the alveoli 24. Volume of air respired, diagram 25. Connection between work and respiration 26. Lung of salamander t.s. 27. Lung of frog t.s. 28. Lung of lizard t.s. 29. Enlargement of pulmonary respiratory surface of various vertebrates 30. Influence of varying composition of the air on respiratory frequency 31. Position and function of the carotid bodies 32. Regulation of respiration, diagram 33. Feedback system of the regulation of respiration 34. Miliary tuberculosis in human lung t.s. 35. Deposition of dust in human lung 36. Dust concentration in different towns 37. Absorption of carbon monoxide and oxygen by hemoglobin 38. The London smog catastrophe of December 1952

No. 747. The Human Circulatory System, Part I: Blood and Lymphatic Organs.

Compilation: OStR Michael Duenckmann. 35 Projection Slides

1. Cylinders with precipitated and clotted blood 2. Composition of the blood 3. Human blood smear, general view 4. Human blood smear, detail of blood corpuscles 5. Shape and size of an erythrocyte 6. Pressure of oxygen and oxygen-saturated hemoglobin, diagram 7. Red bone marrow 8. Erythrocyte and erythroblast, electron micrograph 9. Blood smears of frog and chicken 10. Types of leucocytes 11. Blood smear from leukemic person and normal blood smear 12. The steps of blood clotting, diagram 13. Electrophoresis of protein fractions in blood 14. Human leucocytes with phagocytosed bacteria 15. Leucocyte, moving through the capillary wall 16. Antibodies with antigen binding sites 17. Serum reactions to show relationship 18. The AB0 blood groups 19. Positive and negative reactions of AB0-blood groups 20. Diagram of agglutination of the AB0-blood groups 21. Diagram of Rh-incompatibility 22. The human lymphatic system 23. Exchange of substances in capillaries 24. Human lymph node, general view 25. Follicle in human lymph node 26. Structure of a lymph node blood and lymph vessels 27. Human immune system, diagram 28. Development of lymphocytes. Memory cells 29. Plasma cell, electron micrograph 30. Human spleen, t.s. 31. The vascular system of human spleen 32. Splenic sinus, electron micrograph 33. Human palatine tonsil, t.s. 34. Thymus gland, t.s. Hassall bodies 35. Human pharyngeal tonsil, t.s.

No. 751. The Human Circulatory System, Part II: Heart and Blood Vessels.

Compilation: OStR Michael Duenckmann. 32 Projection Slides

1. Position of the heart in the human body 2. Front view of heart and big vessels 3. Human heart, I.s. 4. View of the cardiac valvular plane 5. Transection of the two cardiac ventricles 6. Structure of the cardiac muscle I.s. 7. Activity of the heart 8. Cardiac cycle. Diagram 9. Pressure and volume of the left ventricle 10. Human circulatory system 11. Stimulation and coordination of the heart 12. Human electrocardiogram 13. Diagram of human blood circulation 14. Catchment areas of the portal vein 15. Blood share of the different organs 16. Heart and blood circulation of vertebrates 17. Human artery and vein, t.s. low magnification 18.





Artery of muscular type, t.s. 19. Human carotid artery, t.s. 20. Carotid artery wall, t.s. stained for elastic fibres 21. Bagpipe function of the aorta 22. Arrangement for taking the human blood pressure 23. Pulse during reduction of the pressure in the bag 24. Blood capillaries in the mesenteries 25. Ultrastructure of the capillary wall 26. Interchange of substances between capillary and tissue 27. Pressure and volume in human circulation 28. Human vein, t.s. 29. The action of the valves of the veins 30. Position of the main baroreceptors 31. Analysis of manipulated blood pressure. 32. Regulation of arterial blood pressure. Negative feedback system

No. 710. Reproduction.

Compilation: Prof. Walter Mergenthaler. 37 Projection Slides

1. Asexual reproduction of Amoeba by amitotic division 2. Asexual reproduction of Hydra by budding 3. Sexual reproduction of Hydra 4. Reproduction of sea-urchin, life cycle 5. Fertilization of sea-urchin egg 6. Reproduction in fishes 7. Reproduction in salamanders 8. Female reproductive organs of vertebrates 9. The human male reproductive organs, side view 10. The human male reproductive organs, diagram 11. Testis, t.s. 12. Seminiferous tubule with spermatogenesis, t.s. 13. Testis, epididymis, spermatogenesis, diagrams 14. Spermatozoa of bull 15. Human hair, egg, and spermatozoon; comparison of sizes 16. The human female reproductive organs, side view 17. The human female reproductive organs, front view 18. Ovary, t.s. general structure 19. Egg development: primary follicles 20. Ditto. secondary follicle 21. Ditto. Graafian follicle, early stage 22. Ditto. Graafian follicle, mature stage 23. Ditto. mature egg 24. Corpus luteum t.s. 25. Fallopian tube t.s. 26. Ciliated epithelium of fallopian tube. t.s. 27. The yolk sac and the embryonic development of fishes 28. The embryonic membranes of the chicken egg 29. The embryonic membranes of mammals and humans 30. Uterus wall t.s. 31. Menstrual cycle, fertilization, changes of endometrium 32. Oogenesis, ovulation, fertilization, cleavage of fertilized egg, and implantation of blastocyst in the uterine wall 33. Growth of fetus in the uterus 34. Structure and function of the placenta 35. Fetus in uterus 36. Full term baby in maternal abdomen, normal cephalic presentation 37. Beginning of birth, entrance of amniotic sac into the birth canal

No. 755. Embryonic Development of Animals and Human.

Compilation: Dipl. Biol. Christine Himmelein. 36 Projection Slides

1. Fertilization of Ascaris egg, entrance of spermatozoon in the oocyte 2. Mature oocyte with male and female pronuclei 3. Metaphase of the first cleavage of Ascaris 4. Ditto. Telophase 5. Total equal cleavage: 2-, 4-, 8-cell stage, morula 6. Types of eggs and patterns of cleavage I: total-equal, total-inequal, discoidal and superficial up to 8-cell-stage 7. Ditto. II: morula and blastula 8. Blastula of sea urchin, after total equal cleavage 9. Blastula of frog, after total unequal cleavage 10. Insect, blastula after superficial cleavage 11. Gastrulation of sea urchin, diagram 12. Gastrula of sea urchin, photomicrograph 13. Neurulation in Amphioxus, diagram 14. Neurulation in frog, diagram 15. Neurulation in frog, t.s. 16. Neurula of frog, t.s. 17. Neurula of frog, mid-dorsal region, t.s., detail 18. Neurula of chicken, t.s. 19. Chicken embryo 33 hours of incubation, l.s. 20. Frog embryo, tail bud stage, l.s. 21. Ditto. t.s. 22. Frog larva, 3 days after hatching, l.s. 23. Frog larva after hatching, t.s. 24. Frog larva, t.s. of heart region 25. Chicken embryo, 48-hours, t.s. 26. Chicken embryo, 72-hours, l.s. 27. Chicken embryo, 72-hours chick, circular system injected 28. Chicken, older embryo, l.s. 29. Median l.s. through a human embryo 30. Development of the human heart 31. External changes in the human heart 32. Development of human lungs, t.s. of 6 weeks old embryo 33. Stages of human pulmonary development 34. Development of the human eyes 35. Head of mammalian embryo, sagittal section showing eyes 36. Mammalian embryo, sagittal section with primordia of organs

No. 730. Hormones Part I.

Compilation: Prof. Walter Mergenthaler. 25 Projection Slides

1. Effect of thyroxine therapy on a child 2. The human thyroid gland, situs 3. Exocrine and endocrine glands, diagrams 4. The human hormone glands 5. Human Thyroid gland t.s. 6. Effect of thyroxine on Amblystoma 7. Acceleration of tadpole development by thyroxine 8. Inhibition of growth of rabbits, thyroxine deficiency 9. Myxedema before and after thyroxine treatment 10. Cretinism caused by insufficiency of thyroid 11. Cretin with goiter 12. Endemic cretinism 13. Relations between iodine and goiter 14. Control of goiter with iodine salt 15. Basedow's disease 16. The parathyroid glands, situs 17. The pancreas, situs 18. Islet of Langerhans, t.s. 19. Control of blood sugar level by insulin and glucagon 20. Kidney and adrenal gland, l.s. 21. Kidneys and adrenal glands of rabbit, situs 22. Human kidney and adrenal gland 23. Adrenal gland, t.s. 24. Control of blood sugar level by adrenalin 25. Child with „moonface“ due to cortical tumor

No. 740. Hormones Part II.

Compilation: Prof. Walter Mergenthaler. 23 Projection Slides

1. Bull and ox, effect of castration 2. Castrated fowl, effect of castration on rooster and hen 3. Castrated rooster before and after treatment with sex hormone 4. Testis of mammal, t.s. 5. Interstitial cells of Leydig, t.s. 6. Human ovary, diagrammatic figure 7. Ovary with follicles t.s. 8. Effect of follicle hormone on growth of uterus 9. Corpus luteum t.s. 10. Location of pituitary gland and pineal

body 11. Human pituitary gland, l.s. 12. Human pituitary gland, t.s. of anterior lobe 13. Inhibition of growth of a dog by pituitary removal 14. Pituitary dwarfism in humans 15. Gigantism in humans 16. Acromegaly of human 17. Adiposogenital dystrophy (Froehlich's syndrome) 18. Gonadotrophic pituitary effects on ovary 19. Relations between endocrine glands, diagram 20. Thymus of juvenile and adult person 21. Thymus gland with Hassall bodies t.s. 22. Delayed development of tadpoles caused by feeding thymus 23. Comparison of feeding thyroid with feeding thymus

No. 763. Hormones Part III.

Compilation: OSTd Dr. Karl-Heinrich Meyer. 68 Projection Slides

1. Feedback on thyroid hormones, loop scheme 2. Ditto. hierarchic scheme 3. General scheme of feedback circuit 4. Feedback circuit for blood thyroxine level 5. Neurosecretory cells in hypothalamus (TRH) 6. Hypothalamus and pituitary gland l.s. 7. Neurosecretory cells and vessels for TRH and TSH 8. Development of pituitary and thyroid gland 9. Thyroid follicles and functional states 10. Effect of TSH on thyroid gland 11. Biosynthesis, storage, effect of thyroxine 12. Effect of inhibitors on secretion of thyroid 13. Blood calcium level, parathormone, calcitonin 14. Regulation of the blood calcium level 15. Synthesis of human insulin 16. Islet of Langerhans 17. Regulation of blood sugar level by A- and B-cells 18. Homeostatic regulating mechanism of the blood glucose 19. Development of the adrenal gland 20. The function of the adrenal medulla 21. Biosynthesis of adrenaline, Beta-receptor blocker 22. Effect of noradrenaline and adrenaline 23. Second messenger and cascade mechanism at glycogenolysis 24. Effect of catecholamines 25. Daily stress and lack of exercise 26. Structure and nomenclature of cortical hormones 27. Effects of renine and aldosterone 28. Feedback mechanism on the secretion of aldosterone 29. Ditto. corticosterone 30. Feedback mechanism in the production of corticosterone 31. Corticosterone affects gene activity 32. Effects of corticosterone 33. Increasing population density inhibits reproduction 34. Stress and animal breeding 35. Effects of nicotine and caffeine 36. Adrenal androgens 37. Development of the gonads 38. Leydig's cells and Sertoli's cells 39. Control of secretory action of male gonads 40. Secondary sex characters in humans 41. Recessive hereditary receptor defect causes female phenotype 42. The effect of anabolica 43. Control of ovarian functions 44. Processes during the menstrual cycle 45. Pregnancy: hormonal control by the blastocyst 46. Ditto. by the placenta 47. The antibody pill - hormonal contraception 48. Stimulation of milk production 49. Long bones with epiphyseal line 50. Growth in length of a long bone 51. Hormonal control of growth 52. Hormone release in the posterior pituitary 53. Structure and effect of oxytocin 54. Effects of vasopressin 55. Hormone production in an insect 56. Juvenile hormone and moulting hormone 57. The cooperation of hormones during moulting 58. Moulting hormone ecdysone influences pattern of puffs 59. Quantitative analysis of hormones 60. Gibberellines promote growth 61. Germinating grain (drawing) 62. Germinating grain (photomicrograph) 63. Growth of animal and plant cells 64. Somatotrophic hormone indolacetic acid 65. Polar movement of auxin in the coleoptile tip 66. Positive phototropism of coleoptile tip 67. Lateral illumination causes redistribution of auxin 68. Flavoprotein as a photoreceptor

No. 851. The Nervous Tissue.

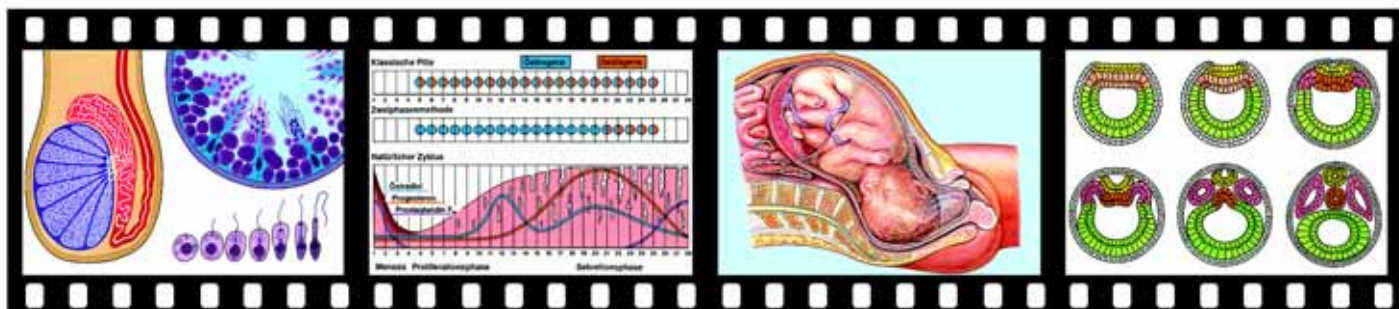
Compilation: Prof. Walter Mergenthaler. 24 Projection Slides

1. Human nervous system, entire 2. Human cerebellum, l.s. 3. Spinal ganglion, t.s. 4. Spinal cord of cat, t.s. silvered 5. Grey matter of spinal cord, t.s. 6. White matter of spinal cord, t.s. 7. Motor nerve cells from spinal cord 8. Purkinje cells from human cerebellum 9. Pyramidal cells from cerebral cortex 10. Pseudo-unipolar neuron (T-cell) from spinal ganglion 11. Bipolar neurons in the retina of the eye, diagram 12. Various shapes of human neurons 13. Nerve cell showing neurofibrils 14. Nissl granules in nerve cells 15. Diagram of a neuron 16. Neuron types of man 17. Human sciatic nerve, t.s. 18. Bundles of human sciatic nerve t.s. 19. Nerve fibres, t.s. axons and medullary sheaths 20. Nerve fibres, l.s. Ranvier's nodes 21. Structure of myelinated nerve fibre, diagram 22. Neuromuscular junction, motor end plate 23. Motor nerve end plates, diagrams 24. Glial cells from brain

No. 843. The Nervous Systems of the Invertebrates.

Compilation: Dr. K.-H. Meyer. 30 Projection Slides

1. Reactions of single cells to stimuli 2. The nervous system of hydra 3. Reaction of hydra to stimuli 4. The nervous system of jellyfish 5. The nervous system of planaria 6. The nervous system of nemathelminthes 7. The evolution of the nervous system in worms 8. The nervous system of the earthworm 9. Reflex arcs in the earth worm 10. Reactions of the earthworm to stimuli 11. The nervous system of insects 12. Concentration of ganglia in insects 13. Development of the nervous system of a beetle 14. Brain of a worker honey-bee, structure 15. Frontal section of insect brain, diagram 16. Head of a locust, l.s. 17. Head of a blow fly, l.s. 18. Unisegmental reflex arcs in insects 19. Intersegmental reflexes in insects 20. Antenna cleaning reflex of the cricket 21. Shape of body and nervous system





in arthropods 22. Nervous system of Chiton 23. Nervous system of freshwater mussel 24. Nervous system of freshwater snail, lateral view 25. Nervous system of freshwater snail, dorsal view 26. Nervous system of terrestrial snail (*Helix pomatia*) 27. Nervous system of cuttlefish 28. Brain of the cuttlefish 29. Nervous system of starfish 30. General structure of echinoderms

No. 847. The Nervous System of the Vertebrates.

Compilation: Dr. K.-H. Meyer. 22 Projection Slides

1. Nervous system of amphioxus, frog and human 2. Embryonic development of central nervous system of amphioxus 3. Ditto. of frog 4. Ditto. of frog, transverse sections 5. Ditto. of humans, transverse sections 6. Development of neural tube in humans, external appearance 7. Development of neural tube into brain 8. Median section through a mammalian embryo 9. Spinal cord of Branchiostoma, lamprey, and bony fish, t.s. 10. Spinal cord of salamander larva, t.s. 11. Spinal cord of the cow, t.s. 12. Comparison of the masses of brain and spinal cord in amphioxus, frog, rabbit, monkey, human 13. Brains of vertebrates (shark, bony fish, amphibian, reptile, bird, mammal), dorsal view 14. Brains of vertebrates, sagittal sections 15. Shift of the optic pathways to the endbrain 16. Formation of the neopallium from concentric growth rings 17. Pattern of mammalian cerebral convolutions, phylogenetic tree 18. Cranial nerves of frog and sheep 19. Human brain, ventral view with cranial nerves 20. Innervation of body regions by cranial nerves 21. Proportion between brain and head in vertebrates 22. Proportion between brain and head in mammals

No. 853. The Spinal Cord.

Compilation: Dr. K.-H. Meyer. 28 Projection Slides

1. The human nervous system. Central, peripheral, vegetative systems 2. Development of spinal cord of frog and man 3. Human vertebrae 4. Human central nervous system, lateral view 5. Human spinal cord in the spinal canal, lateral view 6. Human spinal cord and medulla oblongata 7. The membranes of the brain and spinal cord 8. Position of spinal cord in spinal canal 9. Spinal cord of cow, t.s. 10. The grey matter 11. The white matter 12. Evolution of the spinal cord 13. Proportion of gray to white matter 14. Entrance of dorsal root into spinal cord 15. Dorsal root ganglion, i.s. 16. Roots and branches of spinal nerves, diagram 17. Simple reflex arc, diagram 18. Knee jerk reflex 19. Stepping on a nail, not stimulated organ responds 20. Somatic dermatoms supplied by segments of the spinal cord 21. Polio: syndrome of the ventral gray matter 22. Tabes: tertiary syphilis: syndrome of the dorsal white matter 23. Sclerosis of the pyramidal tract 24. Hemisection of the spinal cord 25. Where do the tracts of somatic sensibility cross? 26. Complete section of the spinal cord 27. Course of typical sensory tracts 28. Course of typical motor tracts

No. 856. The Human Brain. An introduction to the reception, conduction and transmission of information.

Compilation: Dr. Karl-Heinrich Meyer. 45 Projection Slides

A. External structure of the brain 1. The human brain, side view 2. The human brain, sagittal section 3. The human brain, frontal section 4. Visible and in fissures hidden *B. Development of the brain* 5. Hierarchic structure of brain, embryonic development 6. Ditto., its segmentation *C. Reception, conduction and transmission of information* 7. Resting and action potential 8. Sensory input and transduction into action potentials 9. Intensity of stimulus and impulse frequency 10. Propagation of action potential 11. The myelin sheath 12. Fine structure of a Ranvier's node 13. Myelin and conduction of excitation in the axon 14. The myeline sheath in the brain 15. Fine structure of the myeline sheath 16. Diagram of nerve cell of cerebrum 17. Exciting and inhibiting synapses 18. Synapsis, spatial picture 19. Synaptic transmission, diagram *D. Blood supply of the brain* 20. The blood supply of the brain 21. The blood-vascular system, side view 22. Meninges and glia, spatial diagram 23. The blood-brain-barrier 24. The drainage of the brain 25. The reflections of the dura mater 26. The ventricles (liquor spaces) of the brain *E. Structure and function of the brain parts* 1. *Brain stem* 27. Brain stem, ventral and dorsal view *a. Myelencephalon* 28. Lesion caused by diving accident 29. Lesion caused by hemorrhage (stroke) 30. The course of sensory tracts through medulla oblongata 31. The course of motor tracts ditto. *b. Pons* 32. The course of sensory tracts through the pons 33. The course of motor tracts ditto. *c. Mesencephalon and diencephalon* 34. The course of sensory tracts through mid- and interbrain 35. The course of motor tracts ditto. 2. *Cerebrum* 36. Pyramidal cell of the cerebral cortex 37. Areas and tracts of the cerebrum 38. Lobes and areas of the left hemisphere 39. Sensomotor homunculus 40. Intersection of the corpus callosum cerebri: Different function of the cerebral hemispheres 3. *Cerebellum* 41. Cerebellum, views from various sides, sagittal section 42. Purkinje cell of cerebellar cortex 43. Cerebellar cortex and neuronal connections 44. Neuronal arcs of the cerebellar cortex 45. Connection tracts between cerebrum and cerebellum, scheme

No. 842. The Autonomic Nervous System.

Compilation: Dr. K.-H. Meyer. 9 Projection Slides

1. Effect of atropine on one eye 2. Innervation of the iris muscles. Antagonism of sympathetic and parasympathetic system 3. Control of urinary bladder 4. Antagonistic effect on glands and involuntary muscles 5. Tracts of somatic and autonomic nervous system 6. Transmitter and inhibiting substances of synapses and motor end plates 7. Location in relation to the vertebral column 8. Sensory and motor tracts of the autonomic nervous system 9. Regulation of the body temperature.

No. 785. Eye and Vision.

Compilation: Dr. Bernd Zucht. 34 Projection Slides

1. Range of visible light in the electromagnetic spectrum 2. The human eye 3. Sagittal section of the human eye 4. Front region of the human eye 5. Cornea of the human eye, t.s. detail 6. Wall of the human eye ball, t.s. detail 7. Human retina, t.s. detail 8. Human retina, diagram 9. Retina, rods i.s., electron micrograph 10. Central fovea of retina 11. Papilla of optic nerve 12. Retina seen through the ophthalmoscope 13. Developing eyes of young mammalian embryo, section 14. Ditto. older stage 15. Orbital muscles of the eyeball 16. Optic pathways, optic chiasm, diagram 17. Accommodation 18. Mechanism of pupillary light reflex 19. Vision of moving objects 20. Vision of motion explained by the principle of reafference 21. Formation of an image in a normal eye. The eye as a camera 22. Defects of vision: short-sighted and far-sighted eye 23. Image produced by an astigmatic cornea 24. Image produced by „normal“ and astigmatic glasses 25. Pathological turbidity of the lens (cataract) 26. Physiological contrast, simultaneous contrast 27. Optical illusions due to ambiguous information 28. Optical illusions due to surrounding area 29. Converging and diverging lines cause optical illusions 30. Nonconformity of rational interpretation and optical perception 31. Trichromatic triangle. Color vision 32. Spectral sensitivity of rods and cones 33. Tests for color-blindness. Red-green deficiency and blue weakness 34. Color perception and emotion, color test

No. 790. Ear and Auditory Mechanism, Sense of Equilibrium.

Compilation: Dr. Bernd Zucht. 25 Projection Slides

1. The formation of sound waves 2. Eardrum of the frog 3. Auditory ossicles at the skull of a frog 4. Auditory ossicles of human and cat compared with the size of a pin 5. Transformation of auditory ossicles during evolution 6. Development of the internal ear 7. Morphology of the human ear 8. Ear drum with healed up fissure 9. Middle ear and inner ear 10. Auditory canal, eardrum and cochlea, i.s. 11. Cochlea, i.s. showing organ of Corti 12. Organ of Corti, detail 13. Organ of Corti, diagram 14. Movement of Reissner's and basilar membrane 15. Broadening of the basilar membrane 16. Formation of damped waves in the membranous labyrinth 17. Displacement of the membranous labyrinth 18. Amplitude pattern of vibration for high and low frequencies 19. Detection of sound direction 20. Diagram of main auditory pathways 21. Relationship of the two sets of the semicircular canals 22. Semicircular canals, section 23. Ampullar crista, t-s- 24. Otolithic organ (macula), t.s. 25. Function of the vestibular system

No. 795. Sensory perception: Smell, Taste, Touch, Perception of Temperature and Movement.

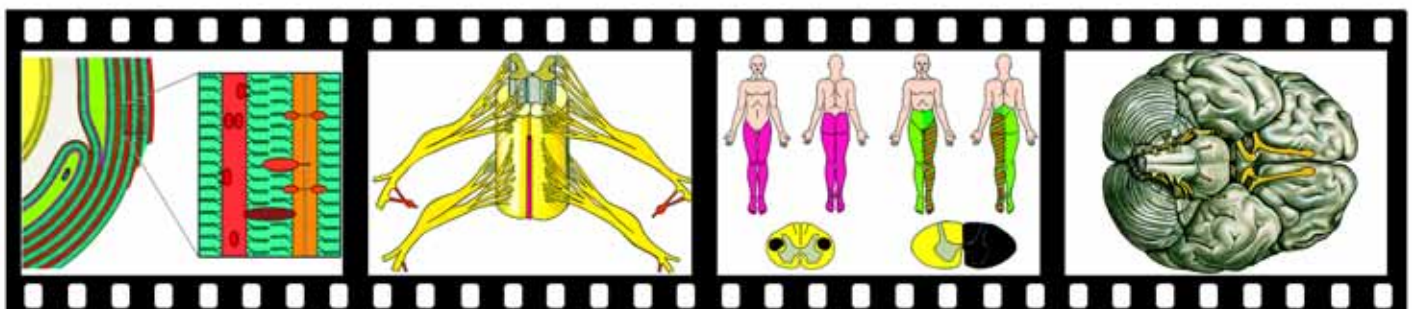
Compilation: Dr. Bernd Zucht. 24 Projection Slides

1. Nasal and pharyngeal cavity. Airstream of the breath 2. Olfactory and respiratory mucous membrane t.s. 3. Olfactory mucous membrane, t.s. detail of sensory cilia 4. Olfactory epithelium, electron micrograph 5. Nasal conchae of human and deer 6. Human tongue with taste buds 7. Tongue of rabbit, t.s. of papilla foliata 8. Papilla foliata t.s., taste buds 9. Vallate papilla t.s., taste buds 10. Fungiform papilla of the tongue t.s., detail 11. Human skin with receptors of touch, pressure and thermal sensation 12. Sinus hair of mouse, i.s. 13. Sinus hair of mouse, t.s. 14. Pacinian corpuscle from the pancreas 15. Meissner's corpuscle from human finger 16. Eimer's corpuscle from the mouth of mole 17. Grandry's and Herbst's touch corpuscles from beak of duck 18. Sensitivity differences caused by touch-stimulation 19. Ruffini's warmth receptor 20. Krause's corpuscle, cold receptor 21. Back of human hand marked with warmth and cold spots 22. Thermoreceptors of a infrared detector of rattle snake 23. Proprioceptors: muscle spindle and tendon apparatus 24. Muscle spindle in muscle, t.s.

No. 1858. Nerve Tissue and Organs of Sense (short set).

Compilation: Dr. K.-H. Meyer, B.S. 15 Projection Slides

1. Ganglion cell 2. Cerebellum with Purkinje cells 3. Cerebrum with pyramid cells 4. Spinal cord with motor nerve cells 5. Nerve fibres 6. Motor nerve end plates 7. Tactile corpuscles 8. Wallate papilla of tongue 9. Taste buds 10. Olfactory epithelium 11. Eye, i.s. 12. Entrance of optic nerve 13. Retina 14. Internal ear, Cochlea 15. Organ of Corti



No. 1850. Human Skin.

Compilation: Dr. K.-H. Meyer, B.S. 22 Projection Slides

1. Human skin from palm, diagram 2. Human skin from palm, t.s. 3. Zone of keratinization 4. Germative zone 5. Blood vessels in the skin 6. Pigmented cells in the skin 7. Human scalp, diagram 8. Human scalp, l.s. of hair 9. Human scalp, t.s. of hair follicles 10. Hair bulb with hair papilla, l.s. 11. Hair papilla, diagram 12. Hair papillae, t.s. 13. Hair shaft with arrector pili muscle and sebaceous gland 14. Sweat gland 15. Sebaceous gland 16. Pacinian corpuscle 17. Tactile organs in skin 18. Nail development, l.s. of fetal finger tip 19. Skin of fetus, sec. showing developing body skin 20. Eyelid, l.s. of eyelash and Meibomian gland 21. Mucous membrane of mouth 22. Mucous membrane of tongue

No. 1854. Ectoparasites of Man.

Compilation: Dr. Bernd Zucht. 29 Projection Slides

1. Stable fly, *Stomoxys calcitrans*, mouth parts 2. Tse-Tse fly, *Glossina brevipalpis*, sucking specimen on skin 3. Gadfly, *Tabanus*, head with eyes 4. Gadfly, *Chrysosoma*, head with mouth parts 5. Malaria mosquito, *Anopheles*, sucking specimen, male and female 6. Common mosquito, *Culex*, male and female 7. Malaria mosquito, *Anopheles*, and Common mosquito, *Culex*, both mouth parts for comparison 8. Common mosquito, *Culex*, life cycle 9. Gnat, *Simulium damnosum*, adult 10. Onchocercosis, infected eye and leg of human 11. Human flea, *Pulex irritans*, adult and lesions on human skin 12. Rat flea, *Xenopsylla cheopis*, w.m. of specimen, living adult and larva 13. Dog flea, *Ctenocephalides canis*, adult female and rat flea, *Nosopsyllus fasciatus*, adult male 14. Sand flea, *Tunga penetrans*, fully engorged specimen 15. Head louse, *Pediculus capitis*, adult 16. Head louse, adult sitting on woollen texture, and eggs attached to the hair 17. Body louse, *Pediculus corporis*, adult 18. Crab louse, *Phthirus pubis*, adult 19. Cone nose bug, *Rhodnius prolixus*, living adult. Carrier of trypanosomes 20. Bed bug, *Cimex lectularius*, adult sucking on human skin and photomicrograph 21. Tick, *Ixodes ricinus*, female with eggs and fully engorged specimen attached to skin 22. Tick, , mouth parts and larva 23. Ticks, *Dermacentor andersoni* and *Argas persicus*, adult specimens 24. Mite, life cycle of a three host type 25. Harvest mite (autumnal chigger), *Neotrombicula*, causes trombidosis 26. Itch mite, *Sarcoptes scabiei*, w.m. of adult specimen and t.s. of human skin with parasites 27. Follicle mite, *Demodex folliculorum*, w.m. of adult specimen and t.s. of infested human skin 28. Leech, *Hirudo medicinalis*, lesions on human skin caused by sucking leeches 29. Furcocercaria of *Schistosoma mansoni*

No. 715N. Anatomical Color Picture Plates, Diagrams and Life Cycles in Zoology, Parasitology and Botany.

122 Color Projection Slides 35 mm. Excellently drawn anatomical color plates serve as models for this series. For description purposes they are furnished with indication lines and a detailed legend.

Zoology, Histology, Parasitology. 1. Typical animal cell, all details 2. Cell division, nine stages 3. *Amoeba proteus*, life cycle 4. *Euglena*, life cycle 5. Noctiluca, marine flagellate, anatomy 6. *Paramecium*, common ciliate, anatomy 7. *Foraminifera*, many species 8. *Radiolaria*, many species 9. Parasitic Protozoa, 12 species 10. Sponge of the sycon type 11. Sponge of the ascon type 12. Hydra, anatomy and life cycle 13. Hydra, t.s., nematocysts 14. Polyp and medusa (*Obelia*), life cycle 15. Polyp (*Obelia*), polyps 16. *Dicrocoelium lanceolatum*, anatomy 17. *Fasciola hepatica*, anatomy 18. *Taenia saginata* (tapeworm), life history 19. *Taenia solium*, life history 20. *Ascaris lumbricoides*, structure and life history 21. *Ascaris*, schematic t.s. 22. *Ascaris*, reproductive, excretory system 23. *Trichinella spiralis*, structure and life history 24. *Lumbricus*, earthworm, schematic t.s. 25. *Lumbricus*, circulatory and digestive system 26. *Lumbricus*, reproductive system 27. *Daphnia* and *Cyclops*, small crustaceans, anatomy 28. *Astacus* (crayfish), habit and structure 29. *Astacus*, circulatory system 30. *Rotatoria* (rotifers) 31. *Blatta* (cockroach), habit, mouth parts 32. *Blatta*, adult female, dorsal view 33. *Blatta*, male and female sex organs 34. *Blatta*, circulatory, respiratory system 35. *Blatta*, digestive, nervous system 36. Stigma of insect 37. Compound eye of an insect, histology 38. Sting of honey bee, anatomy and function 39. Incomplete metamorphosis of insect, grasshopper 40. Complete metamorphosis of insect, butterfly 41. *Bombyx mori* (silkworm), habit, development 42. *Helix* (snail), reproduction 43. *Pecten* (mussel), simple lens eye 44. *Asterias* (starfish), habit, water vascular system, feeding 45. *Asterias*, schematic t.s. of arm (ray) 46. *Asterias*, life cycle 47. *Amphioxus* (*Branchiostoma lanceolatum*), block diagram 48. *Amphioxus*, circulatory system 49. *Amphioxus*, embryonic development 50. *Amphioxus*, young embryo, t.s. and l.s. 51. *Scyllium* (dogfish), circulatory system, diagram 52. *Scyllium*, digestive, reproductive system 53. *Perca* (perch), habit, internal organs, circulatory system, head and gills 54. Fish scales, the different types 55. Coelome types in fishes, reptiles, birds and mammals 56. *Rana* (frog), diagram of circulatory system 57. *Rana*, heart, respiratory organs 58. *Rana*, digestive organs 59. *Rana*, brain in dorsal and ventral view 60. *Rana*, male and female urogenital system 61. *Rana*, skeleton 62. Turtle (*Testudo*), digestive system 63. Turtle, male and female reproductive organs 64. Turtle, shield and bones 65. Bird (*Columba*), arterial and venous system 66. Bird, digestive system 67. Bird,

male and female reproductive systems 68. Bird, brain dorsal and ventral view 69. Bird, construction of egg 70. Bird, the different feather types 71. Bird, skeleton 72. Mammal (rabbit), circulatory system 73. Mammal, respiratory, digestive system 74. Mammal, brain, dorsal and ventral view 75. Mammal, skeleton of rabbit 76. Epithelium, 7 different types 77. Connective tissue, 6 different types 78. Adipose tissue, histology, development 79. Smooth (involuntary) muscles, histology 80. Striated muscles, histology and function 81. Red blood cells (erythrocytes) of 12 species for comparison 82. Retina from eye, diagram and t.s. 83. Skin with hairs from scalp, l.s.

Botany. 1. Typical Plant Cell, all details 2. Maturation divisions in pollen mother cells of *Lilium*, 18 stages 3. *Chlamydomonas*, sexual and asexual reproduction 4. *Volvox*, structure, reproduction 5. *Cladophora*, life cycle 6. *Spirogyra*, fine structure 7. Diatomaeae, marine and fresh water species 8. *Fucus* (brown alga), habit, reproduction 9. *Physcia* (lichen), apothecium 10. Mushroom, habit and fine structure 11. Mushroom, life cycle, + and -spores 12. *Rhizopus* (mold), sexual reproduction, zygospores 13. *Saccharomyces* (yeast), sexual and asexual reproduction 14. *Claviceps purpurea*, (ergot), life cycle 15. *Puccinia graminis*, development of spores 16. Liverwort (*Marchantia*) life cycle 17. Moss (*Mnium*) life cycle 18. Horse tail (*Equisetum*) life cycle 19. Fern life cycle 20. *Pinus* life cycle 21. Monocot root, diagram of *Zea mays* 22. Dicot root, diagram of *Ranunculus* 23. Monocot stem, diagram of *Zea mays* 24. Dicot stem, diagram of *Helianthus* 25. Vascular bundle of *Cucurbita*, diagram of l.s. 26. Coniferous wood, diagrams of three sections 27. Deciduous wood, diagrams of three sections 28. Plant adaptation, 20 figures showing adaptations in roots, stems, leaves, flowers and fruits 29. Stem adaptation, 17 figures show adaptation of stems 30. Leaf types of four plants, sections 31. Stomata of leaf, surface view and section 32. Leaf types, venation of 14 plant leaves 33. Pollination in different plants, 7 figures 34. Seeds and fruits, 24 figures 35. *Ricinus* plant, cotyledons and embryo 36. Hypogaeal germination in wheat, 5 stages 37. Epigeal germination in castor bean, 6 stages 38. Growth of bean, from semen to adult plant, 5 stages 39. Growth of wheat, from semen to adult plant, 6 stages

CYTOLOGY**No. 905. Cell Nucleus and Chromosomes.**

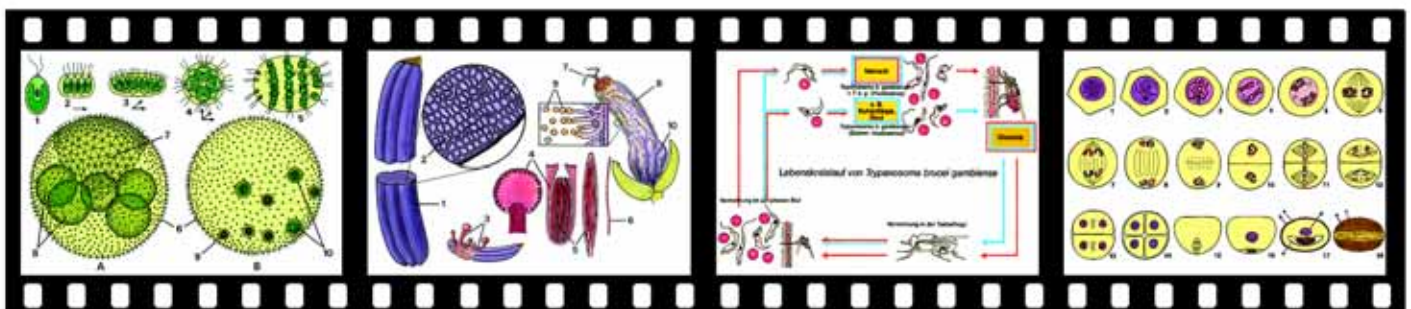
Compilation: Dr. Heinz Streble. 32 Projection Slides

1. Nuclei of *Spirogyra* and amoeba, live 2. Position of nucleus in plant cell, live 3. Onion epidermis: fixed and stained nucleus 4. Metabolically active nucleus of *Vicia faba* 5. Lambrush chromosomes in living egg cell of salamander 6. Polytene giant chromosomes from salivary gland of *Chironomus*, live 7. Sex chromosomes: spermatozoa without and with X-chromosomes 8. Arrangement and shape of nuclei due to tissue functions 9. Nuclear volume due to activity 10. Nuclear size due to synthesizing activity 11. Nuclear shape in cancer cells not due to function 12. Polynucleate cells: giant cells of Langerhans and macrophages 13. Position of nuclei in animal cells, classes of nuclear size 14. Polyploid nuclei of an insect 15. Polyploid chromosome sets of cultivated plants 16. Enlargement of nuclear surface 17. Fine structure of the nucleus, electron micrograph: nuclear membrane, nuclear content, nucleoli, 18. Ditto: nuclear membrane and RNA exit 19. Ditto: fibrillar structure of chromosomes 20. Rearrangement of nuclei in spermatozoa, electron micrograph 21. Mitosis: root tip of *Allium cepa*; all stages in one picture 22. Mitosis: root tip of *Hyacinth*; metabolically active nucleus and early prophase 23. Ditto. prophase and early metaphase 24. Ditto. equatorial plate and early anaphase 25. Ditto. telophase and reconstruction 26. Ditto. chromatid bridges with fragment during anaphase 27. Centrioles, centrospheres, spindle fibres 28. Mitosis: spindle apparatus and chromosomes, electron micrograph 29. Haploid and diploid chromosome sets of various plants and animals 30. Human chromosomes during metaphase 31. Individuality of chromosomes (*Ascaris*) I. Male and female pronucleus, chromosomes of pronuclei 32. Ditto. II. First cleavage spindle, first cleavage.

No. 910. Chromosomes and Genes.

Compilation: Dr. Heinz Streble. 26 Projection Slides

1. Diagram of a chromosome 2. Loop complex of a chromosomal puff 3. Giant chromosomes of *Chironomus*, DNA-RNA-staining 4. Inheritance of two linked genes in *Drosophila* 5. Gene exchange in *Drosophila*, chromosomal interpretation 6. Map of gene locations on chromosomes of *Drosophila* 7. Meiosis: section of mammalian testis 8. Meiosis: squash preparation of mammalian testis. Phases of reduction division 9. Meiosis: lily, pollen development; leptotene stage 10. Meiosis ditto. zygotene stage 11. Meiosis ditto. pachytene stage 12. Meiosis ditto. diplotene stage 13. Meiosis ditto. diakinesis stage 14. Meiosis ditto. metaphase stage 15. Meiosis ditto. anaphase stage 16. Causal relations between crossing-over and chiasmata 17. The crossing-over: breakages, healing 18. Fine structure of genes: crosses of mutants of the coli phage T4 19. Localization of genes, chromosome





aberrations 20. Chromosome mutations: ring-chromosomes, deletions, duplications, deletion of terminal segments, inversions, translocations 21. Extra chromosomes: karyotype of a human with Down's syndrome (trisomy 21, mongolism) 22. Sex chromatin: Barr body of woman 23. Replication: macronucleus before division 24. Replication of chromosomes: introduction of radioactively labelled thymidine 25. Ditto.: distribution of radioactively labelled thymidine by mitoses 26. Germ plasm, somatic cells: chromosome diminution in *Ascaris*

No. 915. Gene and Molecule.

Compilation: Dr. Horst Boehnke. 46 Projection Slides

I. DNA, the hereditary substance 1. Transformation in *Streptococcus pneumoniae* 2. DNA-content of various cells 3. Hereditary substances of bacteriophages (phages) 4. Electron micrograph of T2 phages 5. Reproduction of the phage T2 6. Transmission of DNA into human cells *II. Structure of DNA* 7. Nucleotides and their components 8. Relative components of bases in various DNA 9. Hydrogen bonding between bases 10. Structure of the double helix 11. Electron micrograph of phage-DNA 12. Electron micrograph of sections through bacterial cells (*E. coli*) *III. Replication of DNA* 13. Models of replication 14. Prediction of density of replicated DNA 15. Density gradient centrifugation 16. Replicating DNA molecule I. 17. Replicating DNA molecule II. *IV. DNA and RNA* 18. Differences between DNA and RNA 19. Fractionation of cell components by centrifugation 20. Synthesizing ability of components 21. Function of ribosomes 22. Structure of ribosomes 23. Amino acid-tRNA-complexes 24. Specificity of tRNA 25. Kinds of RNA in the cell 26. Experiments with artificial messengers 27. Polysomes on bacterial DNA 28. Electron micrograph of RNA-phages 29. Coat protein-gene of an RNA-phage 30. Summary: replication, transcription, translation *V. Genetic code and mutation* 31. Colinearity between nucleotide- and amino-acid sequence 32. Frame shift mutations 33. Triplet-binding test 34. The genetic code 35. Relations between codon and anticodon 36. Begin of protein synthesis 37. Section of phage RNA 38. Chemical mutagenesis 39. Effect of mutations *VI. Synthesis, structure, and function of proteins* 40. Protein-synthesizing complex I 41. Protein-synthesizing complex II 42. Secondary structure of proteins: α -helix 43. Secondary structure of proteins: β -pleated sheath 44. Tertiary structure of a protein: β -chain of hemoglobin 45. Sickle cell anemia, erythrocytes 46. Molecular interpretation

No. 890. Electron Micrographs of Animal Cells and Tissues.

Compilation: Dr. Heinz Strebbe. 29 Projection Slides

1. Production of ultra-thin sections for electron microscopy 2. Electron microscope: composition and function 3. Liver cell: distinctive marks of fine structure 4. Fine structure of an animal cell 5. Cell organelles and endoplasmic reticulum 6. Skin: desmosomes, tonofilaments 7. Ciliated epithelium: t.s. and l.s. 8. Cilia, flagella and their structures 9. Secretory cells: exocrine cells of pancreas 10. Ribosomes: fixed on membranes or free floating 11. Resorption: epithelium of intestine with microvilli 12. Resorption: active cells of kidney with long microvilli 13. Glomerulus of kidney, details 14. Lung: epithelial layer 15. Collagenous connective tissue 16. Cartilage: cells in matrix 17. Bone, osteocytes 18. Smooth muscle 19. Skeletal muscle, striated 20. Cardiac muscle, striated: intercalated discs 21. Nervous tissue: t.s. of axons 22. Nervous tissue: l.s. of axon, node of Ranvier 23. Neuro-muscular synapses in skeletal muscle 24. Blood: erythrocytes and erythroblast 25. Blood: granular leukocytes, eosinophils 26. Olfactory epithelium: sensory cells with cilia 27. Retina: rod cells in longitudinal view 28. Ovary: details of ovum 29. Testicles: spermatogenic epithelium

No. 895. Electron Micrographs of Plant Cells and Tissues.

Compilation: Dr. Heinz Strebbe. 29 Projection Slides

1. Typical plant cells: electron micrograph of low magnification 2. Meristematic plant cell: membrane systems 3. Plant cell: three dimensional reconstruction 4. Meristematic plant cell: organelles; high magnified 5. Cell of root tip: high magnified 6. Plasmodesmata 7. Cytokinesis and mitosis in early telophase 8. Mesophyll cell: cell walls, chloroplasts, starch 9. Mesophyll cell: chloroplast, grana, thylakoids 10. Mesophyll cell: details of grana 11. Epidermal cuticle of petiole 12. Leaf stoma: section parallel to surface of a leaf 13. Leaf stoma: transverse sections of stoma cells 14. Gland cells: from leaf of privet 15. Root: central cylinder, transverse section 16. Root: Casparian strip, detail 17. Primary xylem: l.s. 18. Vascular cambium: t.s. of a woody stem 19. Vascular cambium, detail: cambial initial cells 20. Primary phloem: l.s. with sieve plate 21. Fibres: t.s. of fibres 22. Secondary xylem: tracheids 23. Bordered pit: high magnified section 24. Pit membrane and torus: surface relief 25. Angular collenchyma 26. Stone cell: with plasmodesmata 27. Raphid cell: with raphidosomes and crystals 28. Sporogenous cells of anther: meiotic chromosomes 29. Pollen grain: exine, intine, vegetative and sperm nucleus

No. 681. Scanning Electron Micrographs (SEM) of Animals and Plants, Cells and Tissues.

Compilation: Dr. Heinz Strebbe. 70 Projection Slides containing 177 pictures 1. Optical axis of scanning electron microscope 2. The scanning electron

microscope (SEM) 3. Bacteria: spirillum. Two pictures for comparison 4. Diatoms, different species 5. Green alga, *Oedogonium*: Antheridium 6. Cell budding of yeast (*Saccharomyces*) 7. Molds (*Aspergillus* and *Penicillium*) 8. Capsule of moss with peristome and teeth 9. Leaf of corn (*Zea Mays*) 10. Surface of upper epidermis of maple leaf (*Acer*) 11. Stigma and pollen germination 12. Leaf hair of clover (*Trifolium*) 13. Surface of lower epidermis of maple leaf (*Acer*) 14. Flower of dandelion (*Taraxacum*) 15. Stellate hairs of *Elaeagnus* and *Tillandsia* 16. Glandular hairs of marijuana leaf (*Cannabis sativa*) 17. Glandular hairs of *Drosophyllum* 18. Digestive glands of Venus flytrap (*Dionaea*) 19. Monocot and dicot herbaceous stems for comparison 20. Wood cells of fir (*Abies*) 21. Bordered pits of fir (*Abies*) 22. Wood of lime (*Tilia*), tangential section 23. Wood of lime (*Tilia*), radial section 24. Male flower of corn (*Zea mays*), seven stages 25. Pollen grains of various plants 26. Development of a slime mold (*Dictyostelium*) I: amoebae, pseudoplasmodium 27. Ditto. II: basal disc, sporangium, stalk 28. Amoeba (*Pelomyxa carolinensis*) 29. Foraminifera, various species 30. *Didinium nasutum*, parasite of paramaecium 31. Paramaecium: the ciliary movement 32. Paramaecium: the trichocysts 33. Stentor, large ciliate 34. *Euplotes*, ciliate. Morphology, binary fission, pericell 35. *Vorticella*, stalked ciliate 36. Hydra, morphology, nematocysts 37. Planaria, structure 38. *Schistosoma mansoni* (Bilharzia), morphology 39. Nereis, marine polychaete, head and segments 40. Earthworm (*Lumbricus*), external anatomy 41. Nauplius larva of *Artemia* (brine-shrimp) 42. Centipede, head and segments 43. Ant, head and mouth parts 44. Ant, leg 45. Compound insect eye of the honey bee 46. Antenna and wing of a mosquito (*Culex*) 47. Head and thorax of a male gnat (*Chironomus*) 48. Frontal view of a moth fly 49. House fly: antenna, haltere, labellum 50. Sucking tube of a blowfly (*Brachycera*) 51. House fly (*Musca domestica*), leg and eye with facets 52. Mite (*Acarina*): total view, mouth parts and leg 53. Radula of snail, radula teeth 54. Cell division of cancer cells, six stages 55. Cell organelles: from KB-cells 56. White blood cells (leucocytes) 57. Red blood cells (erythrocytes) in thrombus 58. Human tongue, surface view with papillae 59. Ciliated epithelium in human trachea 60. Epithelium of fallopian tube with cilia and microvilli 61. Large intestine (colon), epithelial and goblet cells 62. Glomeruli of kidney 63. Striated cardiac muscles, intercalated discs 64. Ear (organ of Corti), with sensory hair cells 65. Ear (organ of Corti), detailed view of hair cells 66. Lens of the eye with lens fibres 67. Tooth, dentinal tubules, enamel prisms, canaliculi 68. Human hair, normal and damaged hair cuticle 69. Embryology of frog (*Rana*) I: egg to thirty-two-cells 70. Embryology of frog II: blastula to tailbud stage

No. 3300. Maturation and Cleavage of *Ascaris megalocephala* bivalens. 17 Color Photomicrographs

1. Primary germ cells in oviduct 2. Entrance of spermatozoon in the oocyte 3. Oocyte before beginning of reduction divisions 4. First maturation division in the oocyte 5. Formation of the first polar body 6. Second maturation division of the oocyte 7. Formation of the second polar body 8. Mature oocyte with male and female pronuclei 9. Fertilization of maternal and paternal chromosomes 10. Metaphase of first cleavage, frontal view 11. Metaphase, equatorial plate in side view 12. Anaphase, movement of the daughter chromosomes 13. Early telophase, constriction of cell body 14. Telophase, further division of cell body 15. Late telophase, complete division of the cell body 16. Second cleavage with two division figures 17. Later stage of development showing young embryo

No. 3610. Cell Division (Mitosis) in the Root Tip of the Hyacinth.

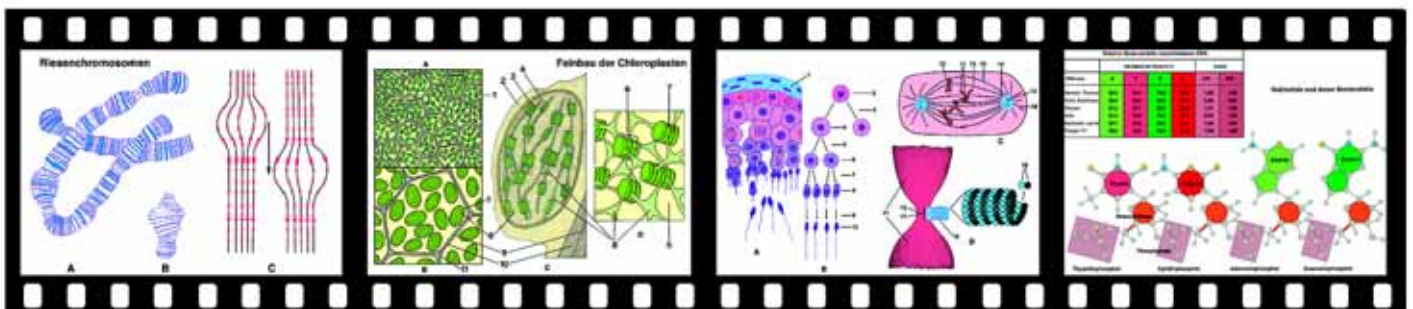
10 Color Photomicrographs

1. Interphase 2. Early prophase, chromosomes as fine threads 3. Late prophase, chromosomes shorten 4. Early metaphase, daughter chromosomes are formed 5. Metaphase, equatorial plate 6. Early anaphase, chromatids separate 7. Late anaphase, chromosomes reach the cell poles 8. Early telophase, chromosomes form daughter nuclei 9. Late telophase, new cell wall is formed 10. Reconstruction of interphase nuclei

No. 3620. Development of the Microspore Mother Cells of Lilium.

24 Color Photomicrographs

1. Young anther of lily, t.s. for general study 2. Microspore mother cells, resting stage 3. Leptotene, chromosomes as fine threads 4. Zygotene, homologous chromosomes associate in pairs 5. Pachytene, complete pairing 6. Diplotene, bivalent chromosomes split 7. Diakinesis, contraction of bivalents 8. Metaphase of the first (heterotypic) division 9. Equatorial plate, surface view 10. Metaphase, side view 11. Anaphase, side view 12. Telophase, new cell wall between daughter cells 13. Prophase of the second (homeotypic) division 14. Metaphase of the second division 15. Pollen tetrads 16. Uninuclear microspores 17. Prophase of third division 18. Metaphase of third division 19. Anaphase of third division 20. Telophase of third division 21. Mature two-nucleate pollen grain 22. Pollen grain, w.m. structure of cell wall 23. Growing pollen grain showing pollen tube 24. Growing pollen tube, l.s. division of generative cell



HUMAN GENETICS, HEREDITISM

No. 900. The Mendelian Laws.

Compilation: Prof. Walter Mergenthaler. 33 Projection Slides

1. Johann Gregor Mendel 2. Similarity of father and son 3. Identical (uniovular) twins 4. Intermediary inheritance in *Mirabilis jalapa* (Marvel of Peru) 5. Backcross in *Mirabilis jalapa* 6. Intermediary inheritance in chicken 7. Dominant inheritance of color in pea flowers 8. Ditto. in pea seeds 9. Yields of Mendel's monohybrid crosses of peas 10. Dominant inheritance in stinging nettles 11. Ditto. in corn (*Zea mays*) 12. Ditto. in the snail *Cepaea hortensis* 13. Ditto. in guinea pigs 14. Backcross of F1 in dominant inheritance 15. Backcross of F2 in dominant inheritance 16. Yields of pea crosses performed by various scientists 17. Dihybrid cross of peas 18. Distribution of characters in dihybrid cross of peas 19. Punnett square for dihybrid cross of peas 20. Backcross of dihybrid peas 21. Dihybrid inheritance in the snail *Cepaea hortensis* 22. Ditto. in guinea pigs 23. Ditto. in snapdragons 24. Punnett square for dihybrid cross 25. Distribution of characters in trihybrid crosses 26. Ratio of numbers in polyhybrid crosses 27. Distributing of parental genetic makeup to children 28. Genetic makeup common to a family 29. Additive factors 30. Supplementary factors in *Lathyrus odoratus* (Spanish vetch) 31. Polygeny in mammalian fur color 32. Lethal factor in canary (*Serinus canaria*) 33. Lethal factor in yellow mice

No. 920. Variability Part I: Modifications.

Compilation: OstR Heribert Schmid. 30 Projection Slides

1. Development of dandelion in mountains and lowlands (experiments of Bonnier) 2. Different shape of plantain growing on field and on forest margin 3. Different shape of pine growing singly and within the forest 4. Modifications of leaves on one branch 5. Modifications of leaves of a ginkgo tree 6. Gentiana plants from various sea levels 7. Stimulating and inhibiting effects on plants 8. Table of binomials and Pascal's triangle 9. Binomial distribution or normal curve of variation 10. Variation curve for number of tail fin rays and lateral scales in fish 11. Variation curve of the size of a single *Paramecium* 12. Unsuccessful selection in culturing *Paramecia* 13. Fingerprints of identical twins 14. Starvation and mast form in sheep 15. Length of tadpole intestine depending on type of food 16. Growth speed of plaice depending on population density 17. Queen and worker bee, nutritional modifications 18. Changing modifications: biastrepic and normal plants 19. Spring and summer form (seasonal dimorphism) 20. Cooling the pupa effects the color of butterfly wings 21. Change of temperature modifies color and size 22. Temperature and light modify the color of petunia flowers 23. Acromelany (temperature modification) in Russian rabbit 24. Forms transitional between submersed and floating 25. Leaves of young and old English ivy 26. Sex change depending on body length 27. Phenotypic sex determination in the worm *Bonellia* 28. Transplantation of frog tissue to salamander tadpole 29. Mossy rose gall 30. Pine galls produced by aphids

No. 925. Variability Part II: Mutations.

Compilation: OstR Heribert Schmid. 30 Projection Slides

1. Normal celandine and its laciniated mutant 2. Leaves of various plants and their laciniated mutant 3. Wild-type sheep and short-legged ancon mutant 4. Goldfish and its mutant 5. Wild-type carp and its mutants 6. Shape and skeleton of a normal and a brachydactylous human hand 7. Wild-type moth and its carbonaria mutant. Protective color 8. Industry melanism of *Biston betularia* in Great Britain 9. Tailless mutant of domestic cat 10. Beetle with duplicated legs 11. Biastrepis and fasciation 12. Normal corn plants and gravitation-blind mutants 13. Normal snapdragon and its cupuliform mutant 14. Factor mutation of snapdragon 15. Progressive reduction of wings in *Drosophila* 16. Fur color of guinea-pig 17. Diagram showing various types of gene mutations 18. Chromosome mutation in a female *Drosophila* 19. Relation between mutated chromosomes and eye size of *Drosophila* 20. Types of chromosome mutations. Diagrams 21. Inversion of chromosome segment in *Drosophila* 22. Chromosome mutations in two varieties of peas. Karyograms 23. Chromosome sets of haploid, diploid, and triploid salamander larvae 24. Haploid, diploid, triploid, and tetraploid plants of *Solanum* (nightshade) 25. Genome mutations in *Drosophila*. Diagram 26. Leaf shape due to various surplus chromosomes 27. Proof of development of a chimera and of somatic mutation 28. Mutagenic effect of nitrous acid on DNA 29. Selection of deficiency mutants in bacteria 30. Metabolic block and accumulation of products. Tracing of metabolic chains.

New Series of Color Slides for Human Genetics (3rd edition).

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No. 1900. Human Genetics Part I. Modes of inheritance.

Compilation: Dr. med. Klaus Zerres, Prof. Dr. Tiemo Grimm. 43 Projection Slides

1. Autosomal dominant inheritance 2. Clinical appearance of neurofibromatosis I: multiple fibromas 3. Ditto. II: Cafe au lait spots 4. Pedigree of a family with neurofibromatosis 5. Clinical appearance of cleft hand 6. Pedigree of a family with cleft hand 7. Pedigree with achondroplasia 8. Codominant mode of inheritance (ABO blood groups) 9. Autosomal recessive mode of inheritance 10. Probability of being heterozygous for the relatives of a homozygous 11. Clinical appearance of albinism 12. Albinism in animals 13. Pedigree of a family with albinism 14. The decomposition of phenylalanine 15. Pedigree with phenylketonuria 16. Pedigree with deafmutism 17. Examples of heterozygosity-effects 18. X-chromosomal recessive inheritance 19. Color plate for testing red-green-blindness 20. Pedigree of a family with red-green-blindness 21. Clinical appearance of muscular dystrophy of Duchenne type 22. The gene of muscular dystrophy of Duchenne type 23. Changes on deletions in the dystrophin gene 24. Pedigree of families with muscular dystrophy 25. Clinical appearance of hemophilia 26. Hemophilia A in the European aristocracy 27. X-chromosomal dominant inheritance 28. Clinical appearance of incontinentia pigmenti 29. Pedigree with incontinentia pigmenti 30. Multifactorial inheritance 31. Recurrence risks of multifactorial inheritance 32. Clinical appearance of harelip and cleft palate 33. Harelip and cleft palate due to amniotic bands 34. Different causes of harelip and cleft palate 35. Clinical appearance of the van der Woude syndrome 36. Pedigree with van der Woude syndrome 37. Clinical appearance of neural tube defects: spina bifida 38. Ditto.: anencephalus 39. Clinical appearance of clubfoot 40. Clinical appearance of psoriasis 41. Example of pyloric stenosis illustrating the „Carter-effect“ 42. Mitochondrial inheritance 43. Pedigree of a family with Leber's optic atrophy

No. 1905. Human Genetics Part II. Cytogenetics.

Compilation: Dipl.-Biol. U. Lukas, Prof. Dr. Gesa Schwanitz. 45 Projection Slides

1. Lymphocyte culture 2. Tissue culture 3. Clones in tissue culture 4. Mitotic activity in tissue culture 5. Barr bodies in cells of the hair bulb 6. Drumstick in a segmented granulocyte 7. Two Barr bodies; karyotype 47,XXX 8. F-body in a human lymphocyte 9. Two F-bodies; karyotype 47,XYY 10. Uniform staining 11. GTG-banding pattern 12. QFQ-banding pattern 13. RBA-banding pattern 14. C-banding pattern 15. SCE (sister-chromatid-exchange) 16. Nucleolus organizing region (NOR), silver staining 17. Normal karyotype with GAG banding pattern 18. Paris nomenclature of chromosomes 19. Trisomy 21; karyotype 20. Boy with Down's syndrome 21. Simian crease in a boy with Down's syndrome 22. Karyotype of a patient with translocation trisomy 21 23. Trisomy 13; karyotype 24. Trisomy 18; karyotype 25. Ring chromosome 18; karyotype 26. Isochromosome X; karyotype 27. Inversion 2; karyotype 28. Karyotype of a girl with „cri-du-chat“ syndrome 29. Child with „cri-du-chat“ syndrome 30. Pedigree of a family showing segregation of a reciprocal translocation 31. Monosomy X; karyotype 32. Patient with Turner's syndrome (monosomy X) 33. Klinefelter's syndrome; karyotype 34. Risk for the birth of a child with chromosome aneuploidy as a function of maternal age 35. Chromosomal findings in spontaneous abortions 36. Triploidy; karyotype 37. Typical alterations of chorionic villi due to triploidy 38. Increased SCE rate 39. Mitosis with multiple aberrations 40. Diagram of aberration types 41. Micronuclei 42. Unspecific chromosome aberrations 43. Table of chromosome breakage syndromes 44. Philadelphia chromosome in chronic myeloid leukemia 45. Marker chromosomes in solid tumors

No. 1910. Human Genetics Part III. Molecular genetics, statistic genetics, population genetics, mutations, blood groups.

Compilation: Dr. med. Klaus Zerres, Prof. Dr. Tiemo Grimm. 52 Projection Slides

1. From DNA to chromosomes 2. Genetic code 3. Restriction enzymes 4. Evidence of DNA sequences by Southern-blots 5. Polymorphisms of restriction fragments (RFLP) in Southern-blots 6. Ditto. and CA-repeats as molecular markers 7. Polymerase chain reaction (PCR) 8. Indirect diagnosis of genotypes, muscular dystrophy of Duchenne type 9. Direct diagnosis of genotypes, muscular dystrophy 10. Erythrocytes in sickle cell anemia 11. Indirect diagnosis of genotypes, sickle cell anemia 12. Ditto., spinal muscular atrophy 13. Direct diagnosis of genotypes, mucoviscidosis 14. Gene map of the X-chromosome 15. Diagram of fluorescence-in-situ-hybridization 16. Proof of a deletion in the elastin-gene on Williams-Beuren-Syndrom by FISH 17. Mode of operation and therapy of hereditary diseases 18. Therapy of mucoviscidosis 19. Germ line therapy and somatic gene therapy 20.





Problems and risks on gene transfer 21. Principles of somatic gene therapy 22. Crossing over 23. Linkage analysis, segregation of two loci with independent inheritance 24. Ditto. with dependent inheritance 25. Ditto. with possible crossing-over 26. Calculation of lodscore-data for linkage analysis 27. Linkage analysis, example Chorea Huntington 28. Law of Hardy and Weinberg 29. IQ of couples, an example of assortative mating 30. Rate of frequency of homozygotes and heterozygotes 31. Types of mutation 32. Mutation rates 33. Role of paternal age in case of new mutations 34. Newborn with Apert's syndrome 35. Pedigree with autosomal dominant mutation (aniridia) 36. Congenital lack of the iris (aniridia) 37. Diagram of oogenesis 38. Diagram of spermatogenesis 39. Molecular genetic evidence for germ cell mosaicism 40. Unstable trinucleotide-mutations, a new type of mutations 41. Imprinting, parent-specific loss of gene function causing hereditary diseases 42. Origin of tumors according to Knudson's two hit model 43. Determination of AB0 blood groups 44. Positive and negative reactions 45. Genotypes and phenotypes in AB0 blood groups 46. Inheritance of AB0 blood groups 47. Exclusion of paternity by AB0 blood groups 48. DNA fingerprints as evidence of paternity 49. Importance of Rh-incompatibility 50. The HLA gene complex on chromosome 6 51. HLA linkage with the adreno-genital syndrome (AGS) in a family 52. HLA associations in various diseases

No. 1920. Human Genetics Part IV. Genetic counselling and prenatal diagnosis, teratogenous injury of fetus, estimated risk, behaviour genetics, twin research.

Compilation: Dr. med. Klaus Zerres, Prof. Dr. Tiemo Grimm. 64 Projection Slides
1. Indications for genetic counselling 2. Concepts of genetic counselling 3. Recurrence risk in a family 4. Potential consequences after genetic counselling 5. Neural tube defect as seen with ultrasound 6. Maternal serum-AFP-level during normal pregnancy and with a neural tube defect 7. Indications for prenatal diagnosis 8. Biopsy of chorionic villi 9. Amniocentesis, fetal blood sampling 10. Diagram of germ cell development of a balanced 14;21 translocation 11. Ditto. of a balanced 12;21 translocation 12. Appearance of alcohol embryopathy 13. Characteristics of alcohol embryopathy 14. Appearance of hydantoin-barbiturate embryopathy 15. Appearance of thalidomide embryopathy 16. Influence of maternal PKU to the fetus 17. Appearance of rubella embryopathy 18. Time-table of teratogens 19. Everyday risks 20. Bayes' theorem 21. Balance between mutation and selection in case of lethal X-chromosomal inheritance 22. Ditto. estimated risk 23. Consanguinity (inbreeding coefficient) 24. Frequency of homozygotes and heterozygotes in autosomal-recessive inheritance 25. Ditto. estimated risk 26. Pedigree of the Bach family 27. Pedigree of the Darwin-Galton family 28. What is intelligence? 29. Frequency distribution of I.Q. values 30. I.Q. values in siblings of persons with mental defects 31. Cytogenetics and clinical appearance of the fragile-X-syndrome 32. Correlation of I.Q. depending on the degree of relationship 33. Heritability 34. I.Q. test data of identical twins 35. Twin data depending on school performance 36. I.Q. test data of female twins above 60 years of age 37. Position of twins in the uterus 38. Typical adult identical (monozygotic) twins, front view 39. Ditto., profile 40. Oral aspect of the identical twins 41. Atypical adult identical twins, front view 42. Ditto., profile 43. Eye regions of identical twins 44. Structure of the iris of identical twins 45. Noses of identical twins, view from the bottom 46. Siamese twins 47. Incomplete conjoined twins 48. Experimental production of complete and incomplete uniovular twins in amphibians 49. Fraternal (dizygotic) twins, front view 50. Ditto., profile 51. Eye regions of fraternal twins 52. Structure of the iris of fraternal twins 53. Ears of fraternal twins 54. Hands of fraternal twins 55. Dermatoglyphics of identical and fraternal twins 56. DNA-fingerprints of identical and fraternal twins 57. Identical (monozygotic) triplets 58. Eye regions of the identical triplets 59. Ears of identical triplets 60. Twin findings in endogenous psychosis 61. Family findings in schizophrenia 62. Concordance rates in manic-depressive twins 63. Family findings in manic-depressive psychosis 64. Reasons for and frequency of twin pregnancy.

EVOLUTION AND ORIGIN OF LIFE

The new slide series present current facts and ideas in order to acquaint the student with the most important views and models of evolution. The arrangement of the series is based on a general conception. The order in principle corresponds to the description of three fundamental subjects of evolution:

1. Problem of the self-organisation of bio-systems (stellar, chemical and organic evolution and development of the prokaryotes)
2. Problem of the reconstruction of phylogenesis (biological evolution of the prokaryotes up to the plant- and animal kingdom)
3. Problem of species variation (elements, mechanisms and ways of evolution in the plant- and animal kingdom)

No. 1411. Origin and Evolution of Life, Part I. Stellar, Chemical and Organic Evolution. Formation of Prokaryotes.

Compilation: Dr. Bernd Zucht. 48 Projection Slides

1. Nomenclature 2. Events, periods 3. Origin of the celestial bodies 4. Origin of the solar system 5. Origin of the lighter chemical elements 6. Origin of the heavy chemical elements 7. Landscape in primeval times of the earth 8. Primeval times of the earth as a chemical cooking pot 9. Apparatus of MILLER for synthesis of amino acids 10. Molecular structure of the primary atmospheres 11. Synthesis of organic compounds in simulated primary atmospheres 12. Possible abiotic synthesis of amino acids 13. Ditto. of oligopeptides 14. Ditto. of polypeptides (proteinoids) 15. Ditto. of purine- and pyrimidine-bases 16. Ditto. of important bio-molecules 17. Simulated polycondensation of amino acids to proteinoids I: Hot lava and amino acids 18. Ditto. II: Melting, generation of steam 19. Ditto. III: Condensation reaction 20. Ditto. IV: Removal of the polymers 21. Abiogenic production of proteinoid-microspheres 22. Origination and primitive metabolism of coacervate droplets 23. Origination of lipid double-films 24. Synthesis of longer nucleic acid frequencies 25. Polynucleotides 26. Polynucleotide aggregates 27. Specific polynucleotide aggregates 28. Net of catalytic protein reactions 29. Reproduction and evolution of nucleic acids 30. Hypercycle of EIGEN 31. Protobionts originated from random proteins 32. Hypothetic propagation of protobionts 33. Hypothetic evolutionary stages of reproduction of protobionts 34. Early metabolic processes of eobionts 35. Basic functions of the life of eobionts 36. Evolutionary stages of metabolism I: Primeval mud to protobionts 37. Ditto. II: Protobionts to prokaryotes 38. Ditto. III: Fermenting, breathing, and photosynthesizing prokaryotes 39. Metabolic processes of a cell 40. Precambrian evidences of life 41. Itabirite. Sedimentation under reducing atmosphere 42. Precambrian microfossils from the South African Precambrian 43. Ditto. from the North American Gunflint-formation and from the Australian Bitterspring-formation 44. Precambrian stromatolite blue-green alga 45. Stromatolite algal reefs 46. Primitive modern organisms: Blue-green algae 47. Ditto. : Bacteria 48. The course of evolution of the organisms, diagram

No. 1418. Origin and Evolution of Life, Part II. The Biological Evolution from the Prokaryotes to the Vegetable and Animal Kingdom.

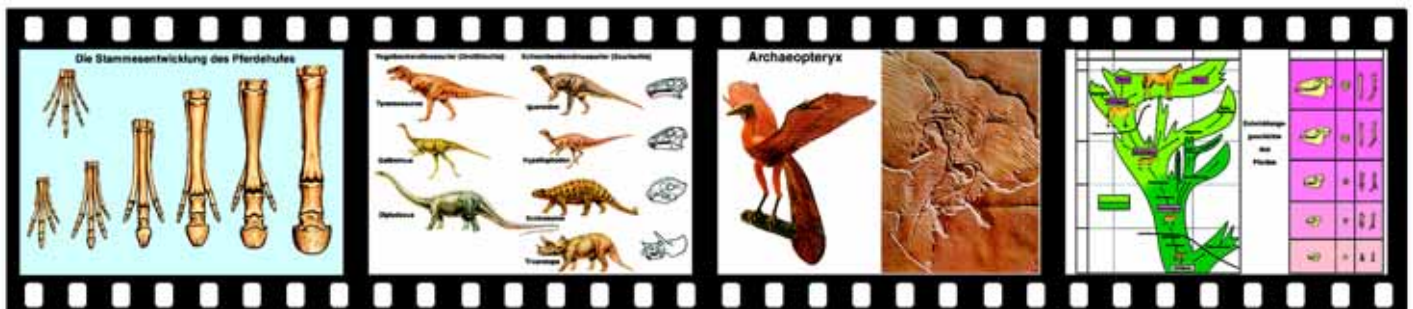
Compilation: Dr. Bernd Zucht. 45 Projection Slides

1. Abiogenic theories and knowledge 2. Christian Genesis 3. Descent of the five phyla of organisms 4. Theory of endosymbiosis 5. Bacterial endosymbiosis in Amoeba 6. Development of flagellate eucytes to algae 7. Colonial forms of unicellular organisms 8. Development from aquatic to terrestrial forms 9. Reconstruction of Rhynia 10. Evolutionary lines of spore-plants 11. The telome hypothesis 12. Phylogeny of leaves 13. Positions of sporangia after telome hypothesis I 14. Ditto. II 15. The stellar hypothesis 16. Fossil siphonostele 17. Psilotum, a modern primeval fern 18. Selaginella, a moss-fern 19. Ginkgo tree, leaves 20. Dicyema (Mesozoa) 21. Gastraea theory after HAECKEL 22. Noto-neuralia and gastroneuralia theory after HEIDER 23. Coelom theory after REMANE 24. Phylogenetic tree of Deuterostomia 25. Development of the coelome 26. Evolution of Chordata I: worm-like to lancet-like animal 27. Amphioxus, Branchiostoma, habit 28. Evolution of Chordata II: vertebrates 29. Ramifications in evolution of vertebrates 30. Morphological variety: cephalopoda 31. Saurians: Ornithischia and Saurischia 32. Establishing saurian relationships 33. Comparison of numbers of species of animals 34. Life history of the earth (life clock) 35. Earth history. Table of rock formations 36. Cambrian period: Scene of landscape with typical animals and plants 37. Silurian period: ditto. 38. Devonian period: ditto. 39. Carboniferous period: ditto. 40. Permian period: ditto. 41. Triassic period: ditto. 42. Jurassic period: ditto. 43. Cretaceous period: ditto. 44. Tertiary period: ditto. 45. Quaternary period: ditto.

No. 1424. Origin and Evolution of Life, Part III. Basis, Mechanisms and Ways of Evolution of the Vegetable and Animal Kingdom.

Compilation: Dr. Bernd Zucht. 56 Projection Slides

1. Courses of evolution 2. Morphological homologies I: Cellular structures 3. Ditto. II: Construction plans 4. Ditto. III: Notochord and vertebrae 5. Ditto. IV: Vertebrate brains 6. Homologies in metabolism I: Adenosine triphosphate (ATP) 7. Ditto. II: Photosynthesis and chemosynthesis 8. Homologous basic processes of life: Mitosis 9. Petrified tree-trunks (Arizona) 10. Fossilized horseshoe crab (Xiphosura) 11. Extinct intermediate animals: Ichthyostega and Archaeopteryx 12. Archaeopteryx: Reconstruction and fossil 13. Living fossil: horseshoe crab Limulus 14. Living fossils in animals and plants 15. Parallel evolution of the African and South American fauna 16. Nauplius larvae 17. Embryonic stages of vertebrate classes 18. Biogenetic law after HAECKEL 19. Pelvic rudiments of a whale 20. Irregular dewclaw of a horse (atavism) 21. Behavioural phylogenetic tree of ducks 22. Biochemic relationship of serum albumins 23. Catastrophe theory of CUVIER 24. Lamarckism (inheritance of acquired characters) and Darwinism (natural selection) 25. Modification: Curves of modification 26. Experiment by Bonnier and unsuccessful selection in culturing paramoecia 27. Modification and mutation 28. Mutagenous effects and mutability 29. Types of mutation 30. Frequency of gen mutations („hot spots“) 31. Mutagenic effect by nitrous acid on DNA 32.





Recombination in budgerigars 33. Allopolyploidy of wheat 34. Forms of selection 35. Natural selection and selection by humans 36. Cryptic appearance, warning coloration, mimicry 37. Quick selection by preadaptation. Industrial melanism 38. Extinction of whole animal groups by extreme selection 39. Isolation. The continental drift theory 40. Geographical and ecological isolation 41. Reproductive isolation among frogs 42. Speciation by geographic separation 43. Speed of evolution. Gene drift 44. Adaptive radiation of marsupials and mammals 45. Synthetic theory of evolution. Genetic landscape 46. Transspecific evolution 47. Forming principles I: Perfection 48. Forming principles II: Gigantism 49. Forming principles III: Hypertely of a l beetle 50. Ontogenic spirals 51. Evolution of the horse 52. Structural relationship of cytochrome C 53. Moss (Bryophytes). Life cycle 54. Fern (Pteridophytes). Life cycle 55. Pine (Gymnospermae). Life cycle 56. The evolution of languages

No. 880. Evolution in examples: Evidence from morphology.

Compilation: Prof. Walter Mergenthaler. 30 Projection Slides

1. Ancestral development of vertebrates I. *Gradations of organ development* 2. Graduation of Spinal column 3. Spinal region of salamander larva t.s. 4. Graduation of vertebrate heart 5. Graduation of vertebrate lung 6. Graduation of middle and outer ear 7. Graduation of inner ear 8. Graduation of vertebrate brain 9. Graduation of mammalian uterus 10. Graduation of snail eye 11. Graduation of intestines of platyhelminthes 12. Graduation of sponges II. *Common structure plans* 13. Echinodermata species 14. Structure plan of echinodermata 15. Coelenterate species 16. Structure plan of coelenterata 17. Jelly-fish pattern 18. Gonophores of jelly-fishes 19. Arm skeleton of blue whale 20. Arm skeleton of sea-turtle 21. Common structure plan of vertebrate limbs 22. Common structure plan of insect mouth parts III. *Rudiments* 23. Pelvis rudiments of a whale 24. Notochord rudiments of vertebrates 25. Arm skeleton of archaeopteryx and pigeon 26. Leg skeletons of horse 27. The ancestral development of the horse's foot 28. Foot skeletons of artiodactyla 29. Premolar teeth of the polar-bear 30. Wing rudiments of female night winter-moths

No. 885. Evolution in examples: Evidence from Embryology.

Compilation: Prof. Walter Mergenthaler. 26 Projection Slides

I. *Repetition of ancestral history in individual development* 1. Upper jaw of ox and ox embryo 2. Whale embryo with primordia of teeth 3. Whale embryo with primordia of posterior limbs 4. Chicken embryo with branchial clefts 5. Human embryo with branchial clefts 6. Frog larva with gills 7. European salamander with gills 8. Development of plaice 9. Development of eel 10. Development of spinal column in fish and reptile 11. Development of pharyngeal arch vessels in vertebrates 12. Development of vertebrate kidneys 13. Development of wing skeleton of birds 14. Embryonic and complete leg of birds 15. Retrogression of tail in bird embryo 16. Irregular dew-claw of a horse 17. Development of stag's antlers 18. Young seal with wool fur 19. Development of nerve system of beetles 20. Development of intestine in liver fluke 21. Sea-lily and its settled juvenile form II. *Common larva forms of related animal groups* 22. Worm-shaped larvae of various insect orders 23. From worm to insect 24. Trochophora larvae 25. Nauplius larvae 26. Embryonic stages of vertebrate classes

No. 1990. Evolution in examples: Evolutionary Model Galapagos Islands.

Compilation: Juergen Grueneberg. 30 Projection Slides

1. Galapagos Islands geographic 2. Insular vulcanism 3. Vegetation 4. Giant Galapagos tortoise; habitus, mode of life, insular endemics, fig. 1 5. Ditto. fig. 2 6. Tropicbird lizard, ethospesies and insular endemics, fig. 1 7. Ditto. fig. 2 8. Land iguana, habitus, co-evolution, fig. 1 9. Land iguana, search for food, fig. 2 10. Land iguana, insular endemics 11. Marine iguana, habitus, adaptations 12. Marine iguana, detail view 13. Marine iguana, insular variety 14. Small ground finch, ecological niches 15. Medium ground finch, ecological niches 16. Cactus finch, ecological niches 17. Woodpecker finch, ecological niches 18. Charles Darwin, biography 19. Species of Darwin's finches, the various bills 20. Swallow-tailed gull, competitive exclusion principle 21. Lava gull, ditto. 22. Galapagos hawk, insular tameness 23. Galapagos penguin, Bergmann's law 24. Albatros, ethogram, courtship behaviour, fig. 1 25. Ditto. fig. 2 26. Ditto. fig. 3 27. Galapagos sea lion, habitus, life and social behaviour, fig. 1 28. Ditto. fig. 2 29. Ditto. fig. 3 30. Ditto. 4

No. 1996. Evolution in examples: Plants of the Canary Islands.

Compilation: Dr. Bernd Zucht. 31 Projection Slides

1. Canary Islands; plant regions 2. Origin by vulcanism 3. Climatic zones 4. Regions of botanical interest and national parks 5. Pioneer plants on young lave 6. Ecological niche I: sandy coastal zone, rocky coast 7. Refuge biotop 8. Ecological niche II: arid zone 9. Homology: Euphorbia canariense and E. regis-jubae 10. Convergence: Euphorbia obtusifolia and Kleinia neriifolia 11. Related species, Ceropegia fusca, and C. dichotoma 12. Ecological niche III: Laurel forest (living paleoflora) 13. Laurel forest and laurel species 14. Tree heath (Erica arborea) 15. Endemites of moist regions 16. Ecological niche IV: Pine forest, natural monoculture 17. Old Canary pine (Pinus canariensis); drip water 18. Rock rose (Cistus sym-

phytoliolus) 19. Ecological niche V: Subalpine region 20. Endemites of small areas 21. Adaptation to extreme habitats: Teide Violet 22. Tenerife, a starting point of endemics 23. Adaptive radiation of Aeonium 24. Different ways of reproduction: Aeonium holochrysum and A. canariense 25. Various species of Aeonium 26. The Dragon Tree, a living fossil 27. Canary Date Palm, beginning species-differentiation 28. Canary Islands, centre of adaptation of cultivated plants 29. Canary plants as mother plants of ornamental plants: 30. Influence of animals to the flora 31. Influence of man to the flora

ENVIRONMENT, POLLUTION CONTROL

No. 1820. Our Environment - Threats and Protection

The newly curricula of all types of schools provide instruction of the subject complex „Environment - threats to environment - protection of environment“. This series of Projection Slides offers visual aids to improve this instruction. Typical examples show which processes are changing the natural structure of our environment and how the dangers arising from this can be counteracted.

Compilation: Dr. Joachim Mueller. 74 Projection Slides. The complete set consists of 3 partial series which can be delivered individually also.

No. 1821. The Landscape. 21 Projection Slides

1. Old type of land cultivated by humans 2. Monoculture 3. Culture steppe 4. Woodland 5. Healthy trees 6. Sick forest 7. Distinctive marks of damaged trees 8. Stages of damaged tree 9. Natural course of a running water 10. Straightened course of a running water 11. Recultivation of a closed waste disposal site, general view 12. Ditto. diagram 13. Stag heap 14. Incorporation of stag heap into the landscape 15. Nature reserves 16. Water reservation 17. Drinking water dams 18. Animals extinct in the 20th century 19. Heavily endangered animals 20. Plants extinct in the 20th century 21. Heavily endangered plants

No. 1823. Soil and Water. 31 Projection Slides

1. Average number of small animals in the top layer of soil 2. Unightly open dumping 3. Controlled waste disposal site, general vie of site 4. Ditto., detail view 5. Ditto., diagram 6. Compostable and non-compostable components of waste (graph) 7. Composting of waste 8. Wild burning of waste in the open country 9. Incinerating plant, function 10. Introduction of sewage into a flowing water 11. Change of oxygen content by introduction of sewage 12. Full biological sewage plant 13. Primary, mechanical treatment in a sewage plant: grit, sand catch 14. Ditto.: primary sludge basin 15. Ditto.: function (diagram) 16. Biological treatment in a sewage plant: activated sludge basin 17. Ditto.: activated sludge basin 18. Ditto.: function of activated sludge 19. Ditto.: organisms of the activated sludge 20. Ditto.: drip towers 21. Ditto.: drip towers, function 22. Basin for secondary clarification 23. Chemical clarification of sewage 24. Causes for salting of surface- and ground water 25. Dangerous concentrations of harmful substances in the water 26. Chemical pest control 27. Biological chain of pesticides 28. Biological pest control, pests and their natural enemies 29. Biological pest control by plants 30. Contamination of the environment with heavy metals 31. Accumulation of heavy metals in the food chain

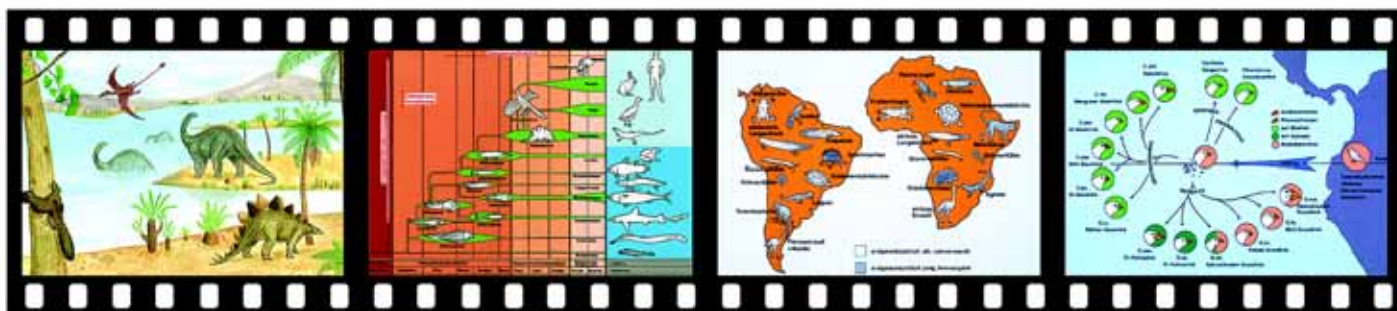
No. 1827. The Air. 22 Projection Slides

1. Structure of the terrestrial atmosphere 2. Importance of the ozone layer 3. Exposure to natural and human-made radiation 4. Half-life of radioactive isotopes 5. Main storage organs for radioactive isotopes 6. Various radiations 7. Sensitivity to radiation 8. Types of smog 9. Development of smog 10. Effect of smog on humans 11. Consumption of air and oxygen by humans and motor vehicles 12. Dangerous substances in exhausts from combustion motors 13. CO-concentration in the air of a main thoroughfare 14. Effect of CO on humans 15. Plants damaged by polluted air 16. Buildings damaged by polluted air 17. Lichens indicate air pollution 18. Harmful substances in tobacco smoke and their effect on humans 19. Mortality by lung cancer of cigarette-smokers and non-smokers 20. Power of various noises 21. Noise map of a big town 22. Effect of noise on humans

No. 1800. Our Waters, Problems of Pollution, Methods of Protection and Recycling.

This series of Projection Slides provides examples and explains the dangers resulting from water pollution. It deals with general aspects of pollution and water purification. The importance of analytical control is demonstrated and the various methods of water purification are described.

Compilation: Prof. Dr. Otto Klee. 121 Projection Slides. The complete set consists of 10 partial series which can be delivered individually also.





No. 1801. Running and standing waters in land developed and cultivated by humans. 8 Projection Slides

1. Dynamic hydrosphere 2. Natural water cycle 3. Natural dynamic of water: waterfall 4. Clear mountain creek. Natural oxygenation 5. Big stones on the banks of mountain creek 6. Creeks and rivers coming from wooded areas ensure steady flow and deep temperature 7. Consequences of correcting of the course of a river 8. Cutting down trees and shrubs on river banks, a wrong step

No. 1802. Natural structure of a running water. 12 Projection Slides

1. Subdivision of a running water, diagram 2. Morphology of a running 3. Protecting from high water 4. Line of water-level duration and profile of bank vegetation 5. Change of the transverse profile shade the water and lower its temperature 6. Installation of small steps on the bed to raise the water-level 7. Protected by trees and shrubs, the water runs a natural course 8. Fish ladders improve biotope 9. Measures to protect flat and steep coasts 10. Active cliff 11. Marram grass *Amphiphila fixes shores* 12. Marram grass fixes dunes

No. 1804. Water tests and survey. 5 Projection Slides

1. Test of water quality: temperature 2. Test of water quality: oxygen content, conductivity, and pH 3. Taking water samples 4. Analysis of water in the laboratory 5. Fully automatic testing of water in laboratory

No. 1805. Grades of waters. 13 Projection Slides

1. Grade I: pure water zone (oligosaprobic zone) 2. Organisms of grade I 3. Grade II: moderately polluted water (beta-mesosaprobic zone) 4. Organisms of grade II 5. Grade III: heavily, critically polluted water (alpha-mesosaprobic zone) 6. Organisms of grade III 7. Grade IV: extremely polluted water (polysaprobic zone) 8. Organisms of grade IV 9. Extremely polluted water (grade IV) of an oasis 10. Water grades between source and mouth of a river 11. Subdivision of a running water according to degree of organic pollution 12. Chemical criteria for grades of pollution 13. Classification of according to bacteriological findings

No. 1807. Pollution of waters by introduction of sewage. 17 Projection Slides

1. Cycle of organic substances in the water 2. Sewage drain on the Mediterranean shore 3. Same place of shore with bathing persons. Extreme danger of infection 4. Introduction of sewage of a town with 100 000 inhabitants into a river 5. Introduction of dairy sewage 6. Introduction of dyes 7. Creek, totally destroyed by hot effluents containing stains 8. Creek, extremely polluted 9. Effluents of an iron factory color the water 10. Destruction of natural bioocenosis by metal sludge 11. Use of wood for poison dump killed trees 12. Introduction of liquid manure causes scum 13. Highly polluted effluents drawing out of cellulose plant 14. Cellulose effluents colors creek dark 15. Consequence of introducing cellulose effluents 16. Oil floating on water 17. Physical, chemical, and biological processes decompose oil floating on water

No. 1809. Eutrophication of lakes and running water. 9 Projection Slides

1. Eutrophication by introduction of phosphates and nitrates 2. Eutrophication and pollution cause death of fish 3. Completely eutrophicated lake 4. Odours caused by microorganisms forming alga bloom 5. Mass reproduction of algae I: *Euglena* 6. Ditto. II: *Asterionella* 7. Production of methane and hydrogen sulphide in an eutrophicated lake 8. Mass reproduction indicates unbalanced biological equilibrium 9. Jellyfish

No. 1810. Redevelopment and restoration of lakes. 13 Projection Slides

1. Unspoiled oligotrophic mountain lake 2. Polysaprobic lake with extreme alga growth 3. Phosphorus cycle in a lake 4. The lake, a phosphate trap 5. Reoligotrophication of lakes, reduction of nutrient spiral 6. Reoligotrophication I 7. Installation of deep water drain 8. Biomass of alga groups after deep water drainage 9. Reoligotrophication II: addition of oxygen 10. Reoligotrophication III: injection of nitrates 11. Manipulation of the food chain, fishing of zooplankton-eating fish 12. Increasing number of predaceous fish 13. Fishing manipulates food chain

No. 1812. Purification and protection of waters, methods. 32 Projection Slides

1. Removal of organic substances in sewage plants 2. Function of a sewage plant 3. Retention of coarse particles by the grit 4. Size of particles in sewage 5. Fluctuations of urban sewage quantity during 24 hours 6. Long sand catch 7. Basin for primary sedimentation 8. Drip tower 9. Section through a drip tower 10. Decrease of biochemical oxygen while trickling through the drip tower 11. Biological clarification with diving cylinders 12. Drip towers to clear effluents from a paper mill 13. Drip tower with water circulation 14. General view of a modern full biological activated sludge plant 15. Turbines swirl and aerate 16. Aeration of activated sludge by bubbles 17. Ditto. by tubes 18. Organisms in the activated sludge basin 19. Organisms: *Vorticella microstoma* 20. Organisms: *Rotaria rotatoria* 21. Clarification of sewage with pure oxygen 22. Supply with pure oxygen in closed system (Detroit, USA) 23. Mass reproduction of *Carchesium* in activated sludge 24. Biocenosis of activated sludge: *Vorticella* 25. Basin for secondary sludge in

sewage plant (Detroit, USA) 26. Flow-over of the purified water 27. Function test 28. Phosphate elimination by chemical precipitation 29. Denitrification eliminates nitrogen 30. Fermentation of sludge in fermentation towers 31. Fermentation in separate towers 32. Efficiency of various clarification steps

No. 1816. Acidification of surface waters - Biocides in waters. 6 Projection Slides

1. Effects of sour rain on aquatic ecosystems 2. Lake in Sweden with high acidification 3. Toxic pH-limit in acid and basic range 4. Summary of contacts of biocides with water 5. Accumulation of biocides in the food chain 6. Direct entry of biocide sprays into the water

No. 1817. Drinking water - Summary. 6 Projection Slides

1. Future demand of water (industrial, domestic) 2. Introduction of surface water into a drinking water plant 3. Precipitation of unwelcome substances 4. Filtration with sand 5. Inconsiderate exploitation of water 6. Good use and processing of water

No. 1310. The Forest - Essential to Life.

The forest as an ecological system. Plants and animals of the wood. The multifarious functions of the forest.

Compilation: Hartmut Dietle. 80 Projection Slides. *The complete set consists of 5 partial series which can be delivered individually also.*

No. 1311. Trees of the forest. 15 Projection Slides

1. Mixed deciduous forest 2. Spruce (*Picea excelsa*) monoculture 3. Silver fir (*Abies alba*) 4. Spruce (*Picea excelsa*) 5. Pine (*Pinus silvestris*) 6. Douglas fir (*Pseudotsuga taxifolia*) 7. European larch (*Larix decidua*) 8. Common beech (*Fagus*) 9. Stone oak (*Quercus sessilis*) 10. Winter lime (*Tilia ulmifolia*) 11. Black alder (*Alnus glutinosa*) 12. Ash (*Fraxinus excelsior*) 13. Mountain ash (*Sorbus aucuparia*) 14. White or canoe birch (*Betula pendula*) 15. European mountain maple (*Acer platanoides*)

No. 1313. The layers of the forest. 19 Projection Slides

1. Moss cushion (*Polytrichum*) 2. Moss (*Mnium*) with capsules 3. Horsetail (*Equisetum*) 4. Horsetail, spores with hapters 5. Shield fern (*Aspidium*), leaflets with sori 6. Fern gametophyte (Prothallium) with antheridia and archegonia 7. Mushroom (*Xerocomus*) 8. Mushroom: basidia of ink-cap (*Coprinus*) 9. Flowering plants: anemones (*Anemone*) and woodruff (*Asperula*) 10. Wood sorrel (*Oxalis*): soil indicator 11. Mezereum (*Daphne*): soil indicator 12. Arum (*Arum maculatum*) 13. Blueberry (*Vaccinium myrtillus*) 14. Shrub layer: blackthorn (*Prunus spinosa*), whitethorn (*Crataegus*) 15. Shrub layer: hazel (*Corylus avellana*), wild rose (*Rosa*) 16. Step-shaped forest margin 17. Layers of the forest, graph 18. Flat and deep rooting plants, graph 19. Ladies tresses (*Neottia*), root with mycorrhiza, t.s.

No. 1315. The forest during the seasons. 14 Projection Slides

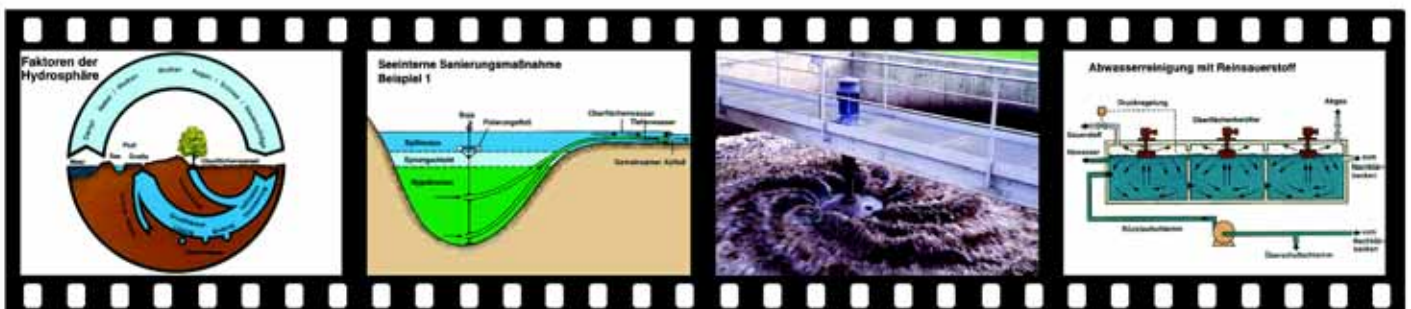
1. Opening bud 2. Beech seedling 3. Maple seedling (*Acer platanoides*) 4. Seedling of silver fir (*Abies*) and pine (*Pinus*) 5. Male flower of pine 6. Female flowers of pine 7. Cones of silver fir and spruce 8. Natural regeneration of forest 9. Summer aspect of forest 10. Sun- and shade-leaf of beech, t.s. 11. Annual rings, t.s. of oak stem 12. Coloring of leaves in autumn 13. Dispersal of fruits and seeds 14. Forest in winter: protection of animals

No. 1317. Animals of the forest. 16 Projection Slides

1. Life on and in the forest floor 2. Red wood ant (*Formica rufa*) 3. Wood snipe (*Scolopax rusticola*) 4. European fir titmouse (*Parus ater*) 5. Black woodpecker (*Dryocopus martius*) 6. Crossbill (*Loxia curvirostra*) 7. Pellets of an owl (*Strix aluco*) 8. Spruce engraver-beetle (*Cryphalus picea*) 9. Engraving pattern of spruce engraver-beetle 10. Gypsy moth (*Lymantria monacha*), imago (pest) 11. Roebuck and roe (*Capreolus*) 12. Fraying roebuck 13. Silver fir damaged by roes 14. Red fox (*Vulpes vulpes*) 15. European squirrel (*Sciurus vulgaris*) 16. Tree marten (*Martes martes*)

No. 1319. Functions and endangering of the forest. 17 Projection Slides

1. Erosion caused by deforestation 2. Fireweed (*Epilobium angustifolium*) growing on clearings 3. Forest holds the soil on steep slopes 4. Forest stores water: wood brook 5. Filter effect of forest, graph 6. Forest and residential areas, exchange of air 7. Forests are sound absorbents 8. Forest improves climate 9. Forest, a recovering resort 10. Wild waste disposal at forest margin 11. Wilful destruction of tree bark 12. Offence against forest law 13. Destruction of forest by ski-lifts 14. Effects of environmental pollution: yellowed needles 15. Effects of sour rain: dying spruces 16. Dying forest („waldsterben“) due to air pollution 17. Lichens on trees are bioindicators for air pollution



No. 1320. Protection of Plants and Pest Control.

Compilation: Hartmut Dietle, 78 Projection Slides *The complete series consists of 5 partial series which can be delivered individually also.*

No. 1321. Economically important diseases of plants 14 Projection Slides

1. Powdery mildew of grain (Erysiphe) 2. Breaking stem of grain (Pseudocercospora) 3. Brown spelt of grain (Septoria nodorum) 4. Bunt of wheat (Tilletia tritici) 5. Ergot on rye (Claviceps purpurea) 6. Reduction disease of potato (viruses) 7. Rottenness of potato (Phytophthora infestans) 8. False mildew on vegetables (Peronospora) 9. Mildew of cucumber (Erysiphe) 10. Bean rust (Uromyces appendiculatus) 11. Scab on fruit (Venturia inaequalis) 12. Gray mold on fruit (Botrytis cinerea) 13. Fungus, a heterotrophic plant 14. Polynucleate sprout of Botrytis spore allows gen combination

No. 1322. Vegetable pests: weeds 13 Projection Slides

1. Table of weeds 2. Some common weeds 3. Four grasses competing with cultivated plants 4. Chalky soil loving plant: Charlock (Sinapis arvensis) 5. Acid soil loving plant: Wild radish (Raphanus) 6. Nitrogen loving plant: Common chickweed (Stellaria) 7. Indicator of wetness: Horsetail (Equisetum) 8. Weed in meadowland: Common dandelion (Taraxacum) 9. Weed germinating in spring (Avena fatua) 10. Weeds germinating in summer: many seeded goosefoot (Chenopodium) 11. Weed germinating in autumn: chamomile (Matricaria chamomilla) 12. Weeds damage by deprivation of light, water, nutrients, space 13. Erosion

No. 1324. Economically important animal pests 22 Projection Slides

1. Piercing-sucking mouth parts of a bug 2. Red spiders, Tetranychidae, on leaf of fruit tree 3. Codlin moth (Laspeyresia) 4. Apple weevil (Anthonomus pomorum), snout beetle 5. White fly (Trialeurodes) 6. Scale insect (Coccidae) on salad 7. Grain aphid (Sitobium) 8. Biting-chewing mouth parts of cockroach (Periplaneta) 9. Radish-root maggot (Phorbia) 10. Beet leaf-miner (Pegomyia betae) 11. Rape beetle (Meligethes aeneus) 12. Flea-beetle (Phyllotreta vittata) 13. European corn-borer (Ostrinia nubilalis) 14. Frit-fly (Oscinella frit) 15. Caterpillar of Pieris brassicae 16. Colorado potato beetle (Leptinotarsa decemlineata) 17. Radula of the slug Deroceras 18. Common garden slug (Deroceras agreste) 19. Field mouse (Microtus arvalis) 20. Vole (Arvicola terrestris) 21. Sparrow, pheasant 22. Muskrat (Ondatra cibethica)

No. 1327. Measures and methods of plant protection 20 Projection Slides

1. Cultivating the soil (plowing, harrowing) 2. Preparation of the seed bed 3. Selection of type 4. Disinfection, treatment of seed 5. Rotation of crops: sugar beets, winter wheat, summer grain, corn, field forage 6. Physical method of weeding 7. Mechanical method of weeding 8. Chemical methods of weeding 9. Steaming of the soil 10. Chemical measures 11. Law of plant protection; procedure of authorization 12. Permissible consumer level 13. Importance of plant protection for business management and work 14. What happens with pesticides in nature? 15. Protection of environment and bees 16. Research on metabolites, gas chromatography 17. Biological measures: Ichneumon fly in greenhouse 18. Biological measures: Predative mites in greenhouse 19. Biological measures: Ladybird beetles against aphids 20. Biotechnical methods: Frightening by bang

No. 1329. Integrated protection of plants 9 Projection Slides

1. What is integrated protection of plants? 2. Integrated protection of plants in apple plantations 3. Economic damage limit 4. Light trap 5. Knocking method 6. Pheromone trap 7. Electronic scab warning instrument 8. Conventional method: Mills'table 9. Protection of useful animals

No. 1840. Useful Insects and Biological Pest Control.

The series presents color macrophotographs of insects, mites, nematodes and fungi, which are able to control, reduce or kill destructive animals and pests. The advantage of biological pest control consists in saving considerable amounts of chemicals, insecticides and fungicides..

Compilation: Rolf Buehl and Dr. Bernd Zucht 27 Projection Slides

1. Ground beetle (Carabus sp.) 2. Ladybird (Coccinella septempunctata) 3. Clutch of eggs and larva of ladybird with plant lice (Aphididae) 4. Green lacewings (Chrysopa carnea) 5. Eggs, larva of green lacewings and plant lice 6. Gall midge (Aphidoletes) and plant louse 7. Larva of gall midge on plant louse 8. Eggs of gall midge between plant lice 9. Ichneumon fly (Aphidius sp.) on eggs of butterfly 10. Larva of cabbage butterfly (Pieris brassicae) with pupae of an ichneumon fly 11. Plant louse parasitized by ichneumon flies 12. Woolly apple aphids parasitized by ichneumon flies 13. Leaf with larval galleries of leaf miners (Phytomyza sp.) 14. Ichneumon fly and larva of leaf miner with larva of ichneumon fly as an ectoparasite 15. Ichneumon fly laying eggs on mealy wings (Aleurodes) 16. Larva of mealy wings parasitized by ichneumon flies 17. Distribution of ichneumon fly larvae versus mealy wings 18. Hover flies (Syrphus sp.) on flower 19. Larva of hover fly on plant louse and eggs 20. Chigger sucking on mite 21. Chigger sucking on thrips 22. Larva of Weevil killed by threadworms (nematodes) 23. Mailing package

of threadworms 24. Plant lice (aphids) infested by fungus (Verticillium lecanii) 25. Caterpillar infested by fungus (Metarhizium anisopliae) 26. Dead of caterpillars, caused by Bacterium thuringiensis 27. Control of snails by domestic ducks

ECOSYSTEMS

Natural biological communities become rarer and rarer. Their abundance of species, the problems of their preservation as well as their importance for the whole ecological structure, even for inconspicuous microhabitats, are treated in these series on hand and documented by characteristic examples. Almost all of the details are photographed in their natural site to secure the greatest possible authenticity.

No. 1843. Ecosystem Forest.

Compilation: Dr. R. Ertel and Dr. B. Zucht 35 Projection Slides

1. Schematic figure of the sections of the wood 2. Moss, Polytrichum (soil protection) 3. Clubmoss, Lycopodium (soil protection) 4. Fern, Aspidium, (soil protection) 5. Blueberry, Vaccinium myrtillus, (soil protection) 6. Privet, Ligustrum 7. Whitethorn, Crataegus oxyacantha 8. Holly, Ilex 9. Spruce, Picea 10. Beech, Fagus 11. Red Ant, Formica rufa 12. Shepherd Spider, Opilio sp. 13. Crab Spider, Thomisus sp. 14. Camberwell beauty (butterfly), Nymphalis antiopa 15. Common Yellow Underwing (butterfly), Noctua pronuba 16. Long Horned Beetle, Cerambyx cerdo 17. Stag Beetle, Lucanus cervus 18. Scolytid Beetle, Ips typographus, gallery design 19. Grass Frog, Rana temporaria 20. Toad, Bufo bufo 21. Common Lizard, Lacerta vivipara 22. Heron, Ardea cinerea 23. Goosander, Mergus merganser, breeding place 24. Goshawk, Accipiter gentilis 25. Capercaillie, Tetrao urogallus 26. European Woodcock, Scolopax rusticola 27. Tengmalm's Owl, Aegolius funereus 28. Black Woodpecker, Dryocopus martius 29. Crossbill, Loxia curvirostra 30. Common Shrew, Sorex araneus 31. Bank Vole, Clethrionomys glareolus 32. Yellow-necked Field Mouse, Apodemus flavicollis 33. Red Squirrel, Sciurus vulgaris 34. Beach Marten, Martes foina 35. Red Deer, Cervus elaphus

No. 1847. Ecosystem Alpine Meadows. Plants.

Compilation: Dr. R. Ertel and Dr. B. Zucht 22 Projection Slides

1. Alpine meadow zone, graph 2. Alpine meadow zone, landscape 3. Flora destroyed by winter sports 4. Crustose lichen, Rhizocarpon geographicum 5. Foliose lichen, Haematomma sp. 6. Alpine meadow grass, Poa alpina 7. Grassland, Nardus stricta 8. Fern, Botrychium lunaria 9. Alpine birch, Betula nana 10. Gentian, Gentiana verna 11. Gentian, Gentiana punctata 12. Alpine Rose, Rhododendron ferrugineum 13. Alpine Soldanel, Soldanella sp. 14. Biscutella laevigata, an Alpine crucifere 15. Rampion, Phyteuma sp. 16. Pasqueflower, Anemona pulsatilla 17. Mountain Avens, Dryas octopetala 18. Lion's Foot, (edelweiss), Leontopodium alpinum 19. Liliium martagon, an alpine lily 20. Nigritella nigra 21. Orchis globosus, an alpine orchid 22. Dwarf Pine, Pinus mugo

No. 1860. Ecosystem Alpine Meadows. Animals.

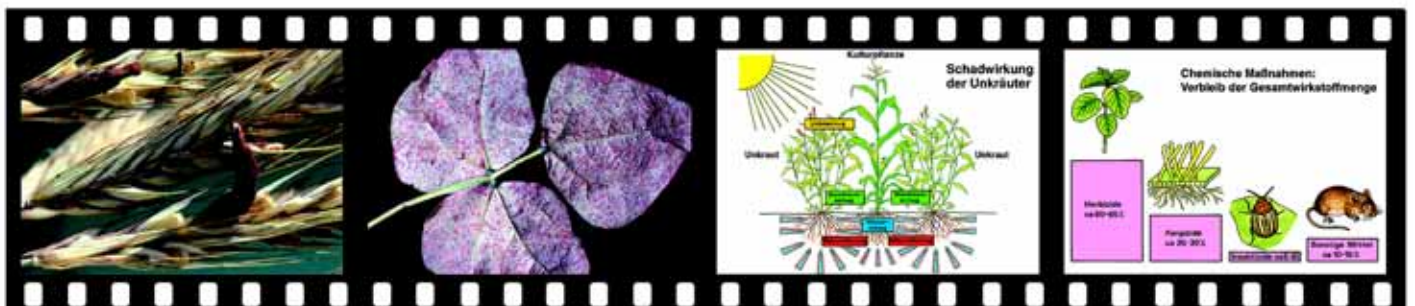
Compilation: Dr. R. Ertel and Dr. B. Zucht 20 Projection Slides

1. Ecological niches for the animals of the high mountain region 2. Alpine Blue Butterfly, Lycaena sp. 3. Painted Lady, Vanessa cardui 4. Gaurotes virginea 5. Alpine Carabid Beetle, Carabus sp. 6. Siberian Grasshopper, Gomphocerus sibiricus 7. European Black Salamander, Salamandra atra 8. Mountain Lizard, Lacerta vivipara 9. Golden Eagle, Aquila chrysaetos 10. Alpine Ptarmigan, Lagopus mutus 11. Water Pipit, Anthus spinoletta 12. Alpine Accentor, Prunella collaris 13. Wheatear, Oenanthe oenanthe 14. Snow Finch, Montifringilla nivalis 15. Alpine Chough, Pyrrhocorax graculus 16. Raven, Corvus corax 17. Snow Vole, Microtus nivalis 18. Blue Hare, Lepus timidus 19. Marmot, Marmota marmota 20. Ibex (Steinbock), Capra ibex

No. 1835. Ecosystem Pond. Plant Society.

Compilation: Dr. R. Ertel and Dr. B. Zucht 24 Projection Slides

1. Pond on working days 2. Pond on weekends 3. Zone of warping (picture) 4. Zone of warping (diagram) 5. Plant living submerged: Chara sp. 6. Plant with submersed leaves: water buttercup (Ranunculus aquatilis) 7. Ditto.: water milfoil (Myriophyllum sp.) 8. Ditto.: water pest (Elodea canadensis) 9. Plant with floating leaves: yellow and white pond lily (Nuphar sp.) 10. Ditto.: water aloe (Stratiotes aloides) 11. Reed bed: reed (Phragmites communis) 12. Reed bed: cat-tail (Typha latifolia) 13. Reed bed: bur-reed (Sparganium erectum) 14. Shallow water: water plantain (Alisma) and duck weed (Lemna) 15. Shallow water: arrow head (Sagittaria) 16. Shallow water: iris (Iris sibirica) 17. Shallow water: marsh trefoil (Menyanthes trifoliata) 18. Shallow water: horsetail (Equisetum fluviatile) 19. Shallow water: mare's tail (Hippuris vulgaris) 20. Sedge belt: swamp-rush (Helophachis sp.) 21. Forest peat 22. Village pond 23. Artificial scenery with ponds 24. School pond



**No. 1875. Ecosystem Pond. Animal Society.**

Compilation: Dr. R. Ertel and Dr. B. Zucht. 24 Projection Slides

1. Zone of warping of a pond with animals 2. Fresh-water jellyfish, *Craspedacusta* sp. 3. Moss animal (Bryozoa) 4. Fresh water Snail, *Planorbis* 5. Fresh water Snail, *Puccinea* 6. Fresh water Mussel, *Unio* 7. Reed Spider, *Aranea cornuta* 8. Malaria Mosquito, *Anopheles* 9. Alder Fly (Drone Fly), *Sialis lutaris* 10. Damselfly, *Coenagrion* 11. Dragonfly, *Aeschna cyanea* 12. Water Strider (Skipper), *Gerris* 13. Carp, *Cyprinus carpio* 14. Pike, *Esox lucius* 15. Frog, *Rana esculenta* 16. Frog spawn, *Rana esculenta* 17. Ring Snake (Common Grass Snake), *Natrix* 18. Great Reed Warbler, *Acrocephalus* 19. Little Bittern, *Ixobrychus minutus* 20. Coot, *Fulica atra* 21. Gadwall, *Anas strepera* 22. Great Crested Grebe, *Podiceps cristatus* 23. Muskrat, *Ondatra zibethica* 24. Water Shrew, *Neomys fodiens*

No. 1830. Ecosystem Moor.

Compilation: Dr. R. Ertel and Dr. B. Zucht. 28 Projection Slides

1. Formation of an upland moor I: zones of warping of ponds (diagram) 2. Ditto. II: low moor and forest peat (diagram) 3. Ditto. III: raised bog (diagram) 4. Bog with wool grass, *Eriophorum* 5. Forest peat 6. Upland moor (Raised bog) 7. Marginal slope of an upland moor 8. Peat Moss, *Sphagnum*, habitus 9. Leaf of peat moss, *Sphagnum*, with water-storage cells 10. Dying wood at the edge of a moor 11. Protection against suffocation by peat moss *Sphagnum* 12. Hummoks and hollows 13. Fenberry, *Vaccinium oxycoccus* 14. Blueberry, *Vaccinium myrtillus* 15. Cranberry, *Vaccinium vitis-idaea* 16. Heather, *Erica*. Ling, *Calluna* 17. Black Crowberry, *Empetrum nigrum* 18. Star Moos, *Mnium* 19. Sedge Grass, *Carex pauciflora* 20. Sundew, *Drosera* 21. Butterwort, *Pinguicula* 22. White Birch, *Betula pubescens* 23. Moor pine, *Pinus montana* 24. Peat cut 25. Back-swimmers, *Notonecta glauca* 26. Moor Frog, *Rana arvalis* 27. Common Viper, *Vipera berus* 28. Black Crouse, *Lyrurus tetrix*

No. 1838. Ecosystem Puddle.

Compilation: Dr. R. Ertel and Dr. B. Zucht. 13 Projection Slides

1. Melt-water puddle in the mountains 2. Frogs in snow-puddle 3. Red colored puddle, caused by flagellates 4. *Euglena sanguinea*, red flagellate 5. Lowland puddle 6. Branchipus 7. Water-flea, *Daphnia* and *Ephippium* with winter eggs 8. Cartwheel trace with toads, *Bombina* 9. Fire-bellied Toad, *Bombina variegata* 10. Wood puddle 11. Molge in wood puddle, *Triturus alpestris* 12. Small puddle in root region of fallen tree 13. Water Striders in a puddle, *Gerris* sp.

No. 1888. Ecosystem Mud-flats (Shallows).

Compilation: Dr. R. Ertel and Dr. B. Zucht. 28 Projection Slides

1. Shallow coast, schematic figure 2. Shallow coast, photograph 3. Shoal sand 4. Shoal mud 5. Animals, living in the shoal sand and mud 6. Lugworm, *Arenicola marina* 7. Sea Annelid, *Nereis diversicolor* 8. Annelid, *Lanice conchilega* 9. Annelid, *Heteromastus filiformis* 10. Sea Mussel, *Mytilus edulis* 11. Mussels, *Scrobicularia plana* (Hen) and *Solenidae* sp. 12. Soft-shelled Clam, *Mya arenaria* 13. Common Periwinkle, *Littorina littorea* 14. Shallow Snail, *Hydrobia ulvae* 15. Common Cockle, *Cardium edule* 16. Shore Crab, *Carcinus maenas* 17. Shrimp, *Crangon crangon* 18. Shrimp fishing-boat 19. Plaice, *Pleuronectes platessa* 20. Marine Polychaete, *Nereis diversicolor* 21. Common Shellduck, *Tadorna tadorna* 22. Ringed Plover, *Charadrius hiaticula* 23. Dunlin, *Calidris alpina* 24. Oystercatcher, *Haematopus ostralegus* 25. Avocet, *Recurvirostra avosetta* 26. Curlew Sandpiper, *Calidris ferruginea* 27. Seal, *Phoca vitulina* 28. Baby-seal, *Phoca vitulina*, juv.

ANIMALS AND PLANTS

No. 1994. The Structure of Animals.

Compilation: Dr. K.-H. Meyer, B.S. 30 Projection Slides with 75 pictures.

A. Color schematic figures: 1. Structure of a coelenterate, hydra 2. Structure of a flatworm, liver fluke 3. Structure of a roundworm, ascaris 4. Structure of an annelid, earthworm 5. Structure of a mollusc, snail 6. Structure of a crustacean, crayfish 7. Structure of an arachnid, spider 8. Structure of an insect, cockroach 9. Structure of an echinoderm, starfish 10. Structure of a cartilaginous fish, shark 11. Structure of a bony fish, carp 12. Structure of an amphibian, frog 13. Structure of a reptile, lizard 14. Structure of a bird, pigeon 15. Structure of a mammal, dog
B. Color photographs from nature 16. Coelenterates, 4 color photographs 17. Flatworms, 4 color photographs 18. Roundworms, 4 color photographs 19. Annelids, 4 color photographs 20. Molluscs, 4 color photographs 21. Crustaceans, 4 color photographs 22. Arachnids, 4 color photographs 23. Insects, 4 color photographs 24. Echinoderms, 4 color photographs 25. Bony fishes, 4 color photographs 26. Cartilaginous fishes, 4 color photographs 27. Amphibians, 4 color photographs 28. Reptiles, 4 color photographs 29. Birds, 4 color photographs 30. Mammals, 4 color photographs

No. 1933. Birds in Gardens, Parks, and Towns.

Compilation: Dr. R. Ertel and Dr. B. Zucht. 25 Projection Slides

1. Blackbird, *Turdus merula* 2. Sing Thrush, *Turdus philomelos* 3. Oxeye-tit, *Parus major* 4. Blue Titmouse, *Parus caeruleus* 5. Chaffinch, *Fringilla coelebs* 6. Greenfinch, *Chloris chloris* 7. Bullfinch, *Pyrrhula pyrrhula* 8. House Sparrow, *Passer domesticus* 9. Blackcap, *Sylvia atricapilla* 10. Starling, *Sturnus vulgaris* 11. Robin, *Eriothraupis rubecula* 12. Black Redstart, *Phoenicurus ochruros* 13. Hawfinch, *Coccothraustes coccothraustes* 14. House Martin, *Dilichon urbica* 15. Common Swallow, *Hirundo rustica* 16. Phylloscopus collybita 17. White Wagtail, *Motacilla alba* 18. Nuthatch, *Sitta europaea* 19. Great spotted Woodpecker, *Picoides major* 20. Green Woodpecker, *Picus viridis* 21. Collared Turtle-dove, *Streptopelia decaocto* 22. Magpie, *Pica pica* 23. Carrion Crow, *Corvus corone* 24. Old World Kestrel, *Falco tinnunculus* 25. Tawny Owl, *Strix aluco*

No. 1937. Ecological Importance of Insects.

Compilation: Dr. K.-H. Meyer B.S. 17 Projection Slides

1. Structure of an insect (schematic figure) 2. Honey Bee, *Apis mellifica* 3. Bumble Bee, *Bombus terrestris* 4. Wasp, *Paravespula* sp. 5. Hornet, *Vespa crabro* 6. Ichneumon Fly, *Rhyssa persuasoria*, gallnut and imago 7. Brimstone, *Gonepteryx rhamni* 8. Small Tortoiseshell, *Aglais urticae* 9. Peacock, *Inachis io* 10. Hover Fly, *Syrphidae* sp. 11. Green Lacewing, *Chrysopa perla* 12. Lady Bird, *Coccinella septempunctata* 13. Carrion Beetle, *Necrophorus* sp. 14. Colorado Beetle, *Leptinotarsa decemlineata* 15. Red Ant, *Formica rufa* 16. Earwig, *Forficula auricularia* 17. Aphids (plant lice), *Aphis fabae*

No. 1979. Butterflies (Lepidoptera).

Compilation: Dr. R. Ertel and Dr. B. Zucht. 22 Projection Slides

1. Common Swallowtail, *Papilio machaon* 2. Iphiclides (*Papilio*) *podalirius* 3. Apollo, *Parnassius apollo* 4. Marbled White, *Melanargia galathea* 5. Meadow Browns, *Hipparchia* (*Erebia*) sp. 6. Silver-washed Fritillary, *Argynnis paphia* 7. Small Tortoiseshell, *Vanessa (Aglais) urticae* 8. Red Admiral, *Vanessa atalanta* 9. Camberwell Beauty, *Nymphalis (Vanessa) antiopa* 10. Peacock, *Vanessa (Inachis) io* 11. Comma, *Polygona c-album* 12. Small Viceroy, *Limenitis rivularis* 13. Brimstone, *Gonepteryx rhamni* 14. Anthocharis cardamines 15. Blue, male (blue colored), *Lycaenidae* 16. Blue, female (brown colored), *Lycaenidae* 17. Painted Lady, *Vanessa cardui* 18. Hair-streaks, *Zephyrus* (*Thecla*) sp. 19. Skipper, *Hesperia* sp. 20. Cabbage White, *Pieris brassicae* 21. Green-veined White, *Pieris napi* 22. Burnet, *Zygaena* sp.

No. 1943. Useful Herbs and Grasses (Cereals).

Compilation: Dr. K.-H. Meyer B.S. 14 Projection Slides

1. Fodder Beet, *Beta vulgaris* var. *crassa* 2. Sugar Beet, *Beta vulgaris* var. *altissima* 3. Buckwheat, *Fagopyrum esculentum* 4. Rape, *Brassica napus* var. *oleifera* 5. Swede (trunip, rutabaga), *Brassica napus* 6. Potato, *Solanum tuberosum* 7. Sunflower, *Helianthus annuus* 8. Corn (maize), *Zea mays* 9. Millet, *Panicum miliaceum* 10. Oats, *Avena sativa* 11. Spelt, *Triticum spelta* 12. Wheat, *Triticum aestivum* 13. Rye, *Secale cereale* 14. Barley, *Hordeum vulgare*

No. 1945. Medical plants.

Compilation: Dr. K.-H. Meyer B.S. 27 Projection Slides

1. Hawthorn, *Crataegus oxyacantha* 2. Agrimony, *Agrimonia eupatoria* 3. Restharrow, *Ononis spinosa* 4. Mistletoe, *Viscum album* 5. Fennel, *Foeniculum vulgare* 6. St.-John's wort, *Hypericum perforatum* 7. Indian cress, *nasturtium*, *Tropaeolum maius* 8. Linden (Lime), *Tilia platyphyllos* 9. Bearberry, *Arctostaphylos uva-ursi* 10. Elder, *Sambucus nigra* 11. Valerian, *Valeriana officinalis* 12. Lesser centaury, *Centaurium erythraea* 13. Comfrey, *Symphitum officinale* 14. Mullein, *Verbascum thapsus* 15. Ribwort, *Plantago lanceolata* 16. Lavender, *Lavandula angustifolia* 17. Sage, *Salvia officinalis* 18. Balm-mint, *Melissa officinalis* 19. Thyme, *Thymus vulgaris* 20. Peppermint, *Mentha piperita* 21. Milfoil (Yarrow), *Achillea millefolium* 22. Camomile, *Matricaria chamomilla* 23. Tansy, *Tanacetum vulgare* 24. Coltsfoot, *Tussilago farfara* 25. Arnica, *Arnica montana* 26. Marigold, *Calendula officinalis* 27. Dandelion, *Taraxacum officinale*

No. 1949. Poisonous Plants.

Compilation: Dr. K.-H. Meyer B.S. 13 Projection Slides

1. Yew, *Taxus baccata* 2. Monkshood, *Aconitum napellus* 3. Yellow Wolf's Bane, *Aconitum vulparia* 4. Golden Chain, *Laburnum vulgare* (*Cytisus laburnum*) 5. Mezereon (spurge olive), *Daphne mezereum* 6. Deadly Nightshade, *Atropa belladonna* 7. Black Henbane, *Hyoscyamus niger* 8. Bittersweet (Woody Nightshade), *Solanum dulcamara* 9. Thorn apple, *stramonium*, *Datura stramonium* 10. Purple Foxglove, *Digitalis purpurea* 11. Meadow Saffron, *Colchicum autumnale* 12. Lily of the Valley, *Convallaria majalis* 13. Herb Paris, *oneberry*, *Paris quadrifolia*





Compilation: Dr. K.-H. Meyer B.S. 18 Projection Slides

A. *Schematic figures (diagrams)*: 1. Wind pollination (Hazel flower, *Corylus*) 2. Typical flower (Cherry blossom, *Prunus*) 3. Insect pollination 4. Flower of Cruciferae (Cuckoo flower, *Cardamine*) 5. Flower of Labiatae (Sage, *Salvia*), lever mechanism of stamens 6. Flower of Leguminosae (Pea, *Pisum*), style brush 7. Flower of Broom, (*Sarothamnus*), catapult mechanism before and after pollination 8. Flower of Orchis (with Bumble bee), adhesion mechanism B. *Structure of Flowers. Photographs from nature* 9. Hazel, *Corylus avellana* 10. Great willow, *Salix caprea* 11. Dog Rose, *Rosa canina* 12. Rape, *Brassica napus* 13. Cherry, *Prunus avium* 14. Apple, *Malus domestica* 15. Poppy, *Papaver* sp. 16. *Primula*, *Primula officinalis* 17. Sunflower, *Helianthus annuus* 18. Cuckoopint, *Arum maculatum*, (slippery-trap flower)

No. 1954. Biology of Flowers II (Insect Flowers).

Compilation: Dr. K.-H. Meyer B.S. 29 Projection Slides

A. *Beetle flowers*: 1. *Magnolia*, *Magnolia* sp. 2. Cow Parsnip, *Heracleum sphondylium* 3. *Cornelian cherry*, *Cornus mas* 4. *Viburnum*, *Viburnum opulus* B. *Fly flowers*: 5. Fennel, *Foeniculum vulgare* 6. Cleavers (goose grass), *Galium aparine* 7. Bittersweet (woody nightshade), *Solanum dulcamara* 8. Birthwort, *Aristolochia clematis* 9. Birthwort, schematic design of the flower 10. Cuckoopint, *Arum maculatum* 11. Cuckoopint, schematic design of the flower C. *Bee and bumble bee flowers*: 12. Cowslip, *Caltha palustris* 13. Columbine, *Aquilegia vulgaris* 14. Broom Flower, *Sarothamnus scoparius* 15. Bird's-foot trefoil, *Lotus corniculatus* 16. Lime (Linden), *Tilia platyphyllos* 17. Bindweed, *Convolvulus arvensis* 18. Purple Foxglove, *Digitalis purpurea* 19. Blind nettle, *Lamium maculatum* 20. Sage, *Salvia glutinosa* 21. Sage, *Salvia glutinosa*, diagram of the pollination D. *Butterfly flowers*: 22. *Cartusian Pink*, *Dianthus carthusianorum* 23. Summer Lilac, *Buddleja* 24. Stork's-bill, *Geranium pratense* 25. Horse thistle, *Cirsium arvense* E. *Moth flowers*: 26. Evening primrose, *Oenothera biennis* 27. Catchfly, *Silene nutans* (night moth flower) 28. Honeysuckle, *Lonicera periclymenum* (night moth flower) 29. Thorn apple, stramonium, *Datura stramonium*

No. 1957. From Flower to Fruit.

Compilation: Dr. K.-H. Meyer B.S. 14 Projection Slides

1. Cherry, *Prunus avium*, flower and fruit, photographs 2. Ditto., graphic figures 3. Apple, *Malus domestica*, flower and fruit, photographs 4. Ditto., graphic figures 5. Dandelion, *Taraxacum officinale*, flower and fruit, photographs 6. Burdock, *Arctium lappa*, flower and fruit, photographs 7. Touch me not, *Impatiens glandulifera*, flower and fruit, photographs 8. Legume, photograph 9. Legume, graphic figure 10. Siliqua, photograph 11. Siliqua, graphic figure 12. Crane's-bill, *Erodium cicutarium*, flower and fruit, photographs 13. Ditto., fruit, graphic figures 14. Water lily, *Nuphar lutea*, fruit and floating seed, photographs

No. 1330. The Most Important Mushrooms and Toadstools.

Color photographs of an outstanding quality illustrate typical specimens in their habitat. To make determination easier all mushrooms are shown in side and top view and from the bottom side.

Compilation: G. Woelfel. 30 Projection Slides

1. *Boletus edulis*, yellow boletus 2. *Tylopilus felleus* 3. *Boletus erythropus* 4. *Suillus grevillei* 5. *Suillus bovinus* 6. *Suillus luteus* 7. *Suillus variegatus* 8. *Xerocomus badius* 9. *Leccinum scabrum* 10. *Leccinum quercinum* 11. *Paxillus involutus* 12. *Tricholoma auratum* 13. *Tricholoma sulphureum* 14. *Calocybe gambosa* 15. *Inocybe patouillardii* 16. *Amanita phalloides*, death cup (green) 17. *Amanita ritirina*, death cup (yellow) 18. *Amanita muscaria*, fly agaric 19. *Amanita pantherina* 20. *Amanita rubescens* 21. *Macrolepiota procera* 22. *Agaricus campester*, champignon 23. *Agaricus xanthoderma* 24. *Coprinus comatus*, ink cup 25. *Lactarius deliciosus* 26. *Cantharellus cibarius*, chanterelle 27. *Hygrophoropsis aurantiaca* 28. *Hydnum rapandum* 29. *Morchella esculenta*, morel 30. *Gyromitra esculenta*

SCHOOL SETS OF GENERAL BIOLOGY

School Sets I, II, III

The color photomicrographs of our school sets I, II, and III have been selected in cooperation with experienced teachers and scientists. These collections follow the subject matter of well-known textbooks of biology and thereby represent a valuable biological training aid. Each slide has been carefully examined for instructional relevance. The highest technical and scientific standards were applied to the specimens used in the production of the photomicrographs. The sharpness and brilliance of color which distinguish the images on the projection screen are due to the high quality of the original photomicrographs.

No. 100. School Set I. Zoology and Botany. 42 Color Photomicrographs

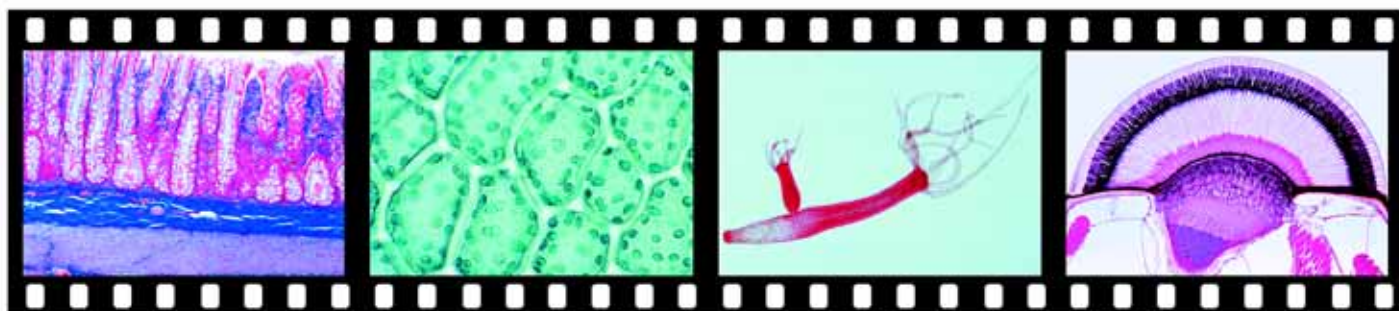
1. *Musca domestica*, house fly, sucking mouth parts 2. *Periplaneta*, cockroach, chewing mouth parts 3. *Apis mellifica*, honey bee, mouth parts of worker 4. *Culex pipiens*, common mosquito, piercing sucking mouth parts of adult female 5. *Periplaneta*, cockroach, typical insect leg 6. *Apis mellifica*, honey bee, hind leg of worker 7. *Apis mellifica*, wings 8. *Pieris*, butterfly, wing with scales 9. *Apis mellifica*, sting and poison sac 10. *Daphnia*, water flea 11. *Araneus*, spider, cephalothorax with mouth parts 12. *Araneus*, spinneret 13. *Ixodes*, tick, piercing sucking mouth parts 14. *Radula* of snail 15. *Lumbricus*, earthworm, t.s. of body 16. *Taenia saginata*, tapeworm, w.m. of gravid proglottid 17. *Distomum lanceolatum*, liver fluke, w.m. 18. *Planaria*, t.s. 19. *Trichinella*, muscle with encysted larvae 20. *Hydra*, w.m. of extended specimen with bud 21. *Hydra*, t.s. through the body. Ectoderm, entoderm 22. *Paramecium*, macro- and micronucleus 23. *Amoeba proteus*, nucleus, pseudopodia, food vacuoles 24. Typical animal cell in t.s. of salamander liver 25. Bacteria, mixed. Cocci, bacilli, spirilla and spirochaetae 26. *Mucor*, pin mold. Mycelium and sporangia 27. *Coprinus*, mushroom, section with basidia and spores 28. *Spirogyra*, vegetative with spiral chloroplasts 29. *Mnium*, moss, w.m. of leaf with chloroplasts 30. Diatoms, different species 31. *Physcia*, lichen, t.s. of thallus showing symbiosis 32. *Aspidium*, fern, t.s. of rachis with bundles 33. Fern prothallium, w.m. with young sporophyte 34. *Aspidium*, fern, t.s. of frond with sori 35. *Pinus*, pine, young female cone, l.s. 36. *Pinus*, male cone, l.s. 37. *Zea mays*, corn, t.s. typical monocot stem 38. *Aristolochia*, t.s. of one-year dicot stem 39. *Aristolochia*, t.s. of older stem. Secondary growth 40. *Aristolochia*, l.s. of older stem with vessels 41. *Syringa*, lilac, t.s. of leaf 42. *Triticum*, wheat, sagittal l.s. of embryo

No. 110. School Set II. Histology. 32 Color Photomicrographs

1. Areolar connective tissue 2. Hyaline cartilage t.s. 3. Compact bone t.s. Haversian canals 4. Striated muscle l.s. detailed structures 5. Smooth muscle l.s. detailed structures 6. Cardiac (heart) muscles, intercalated discs 7. Artery t.s. stained for elastic fibres 8. Vein t.s. stained for elastic fibres 9. Human blood smear 10. Lung t.s. alveoli, bronchial tubes 11. Esophagus t.s. 12. Stomach, fundic region t.s. 13. Small intestine, t.s. showing villi 14. Small intestine, t.s. injected to show blood vessels 15. Large intestine (colon) t.s., with goblet cells 16. Vermiform appendix, t.s. 17. Liver of pig, t.s. 18. Pancreas t.s. islets of Langerhans 19. Kidney of mouse, l.s. complete organ 20. Malpighian corpuscle of kidney, detail view 21. Testis t.s. to show spermatogenesis 22. Ovary t.s. Graafian follicle, corpus luteum 23. Cerebrum, t.s. pyramidal cells 24. Cerebellum, t.s. Purkinje cells 25. Spinal cord t.s. motor nerve cells 26. Eye, median sag. s. with entrance of optic nerve 27. Internal ear, median l.s. of cochlea organ of Corti 28. Thyroid gland t.s. with colloid 29. Human scalp l.s. of hair follicles, sebaceous glands 30. Human skin from finger tip, l.s. 31. Nail development from human embryo, l.s. 32. Tooth development, l.s.

No. 120. School Set III. General Biology. 68 Color Photomicrographs

1. *Euglena*, green flagellate 2. *Paramecium* in binary fission 3. *Trypanosoma gambiense*, sleeping sickness, blood smear 4. *Plasmodium falciparum*, tertian malaria, ring stages and gametocytes 5. *Plasmodium*, infected mosquito stomach with oocysts 6. *Plasmodium*, salivary gland of mosquito with sporozoites 7. *Obelia* hydroid, colony 8. *Obelia medusa* 9. Nephrostome of nephridium from earthworm 10. *Asterias*, starfish, arm t.s. 11. *Branchiostoma* (*Amphioxus*), t.s. 12. *Rana*, frog, blood smear 13. Capillary vessels in mesentery 14. Gills of fish, t.s. 15. Lung of frog, t.s. 16. Lung of lizard, t.s. 17. Eyespot of *Planaria* l.s. 18. Eye of *Helix*, snail l.s. 19. Compound eye of an insect, l.s. 20. Retina from monkey, l.s. detail view 21. Statocyst of a crustacean 22. Organ of Corti, detail view 23. Olfactory epithelium 24. Organ of taste, sec. foliate papilla of rabbit tongue 25. Motor nerve endings in striated muscle 26. Spinal cord, t.s. 27. Motor nerve cell, from spinal cord 28. Purkinje cells, silver stain 29. Medullated nerve fibres, l.s. Ranvier's nodes 30. Mitochondria in sec. of Amphibian liver 31. *Eudorina*, small colonies of flagellates 32. *Volvox*, daughter colonies and gametes 33. *Fucus vesiculosus*, brown alga, conceptacle with oogonia 34. *Fucus vesiculosus*, conceptacle with antheridia 35. *Marchantia*, liverwort, median l.s. of archegonium 36. *Marchantia*, median l.s. of antheridium 37. Stone cells with pit canals 38. Stem apex of *Elodea*, median l.s. 39. *Helianthus*, sunflower, t.s. of typical herbaceous dicot stem 40. *Cucurbita*, pumpkin, t.s. of vascular bundle 41. *Cucurbita*, l.s. of a vascular bundle 42. Leaf epidermis with stomata and guard cells 43. *Nerium*, oleander, leaf t.s. with sunken stomata 44. *Convallaria*, t.s. typical monocot root 45. *Ranunculus*, buttercup, t.s. typical dicot root 46. *Neottia*, orchid, t.s. root with endotrophic mycorrhiza 47. *Cuscuta*, dodder, host with parasitic haustoria, sec. 48. *Ascaris megalocephala*, ovum in early cleavage 49. Ditto. ovum in later cleavage 50. *Hyacinthus*, l.s. of root tips showing mitosis, prophase 51. Ditto. mitosis, anaphase 52. Ditto. mitosis, telophase 53. *Lilium*, ovary t.s., embryonic with megaspore mother cell 54. Ditto. embryonic with anaphase of second division 55. Ditto. mature eight nucleate embryonic 56. *Lilium*, anther t.s. microspore mother cells in early prophase 57. Ditto. diplotene stage 58. Ditto. metaphase of first (heterotypic) division 59. Ditto. metaphase of second (homeotypic) division 60. Ditto. pollen tetrad 61. *Psammechinus*, sea urchin, embryology, two-cell stage





62. Ditto. four-cell stage 63. Ditto. eight-cell stage 64. Ditto. morula 65. Ditto. blastula 66. Ditto. gastrula 67. Giant chromosomes from Chironomus, genes and puffs 68. Human chromosomes in stage of metaphase

No. 130. General Biology College Set.

The selection of 75 color photomicrographs contained herein corresponds to primary and secondary school syllabuses. The series is intended to help the teacher design modern biology teaching programmes and it serves as a means of both visual and practical teaching. 75 Color Photomicrographs

1. Typical animal cells 2. Amoeba proteus 3. Paramecium 4. Hydra w.m. 5. Hydra t.s. of body 6. Trypanosoma gambiense, blood smear 7. Taenia, tapeworm, mature proglottid 8. Trichinella, larvae in muscle l.s. 9. Lumbricus, earthworm, t.s. back of clitellum 10. Apis, mouth parts 11. Apis, hind leg with pollen basket 12. Apis, sting and poison sac 13. Musca, house fly, mouth parts 14. Spider, mouth parts 15. Spider, spinneret 16. Snail, radula 17. Bacteria, mixed species 18. Volvox 19. Coprinus, mushroom, typical basidia and spores t.s. 20. Aspidium, fern, leaf with sori t.s. 21. Fern prothallium 22. Lichen, thallus with symbiotic algae t.s. 23. Moss, archegonium l.s. 24. Moss, antheridium l.s. 25. Lupinus, root nodules with symbiotic bacteria t.s. 26. Pinus, pine, ovulate cone l.s. 27. Pinus, staminate cone l.s. 28. Triticum, wheat, embryo median l.s. 29. Helianthus, sunflower, dicot stem t.s. 30. Cucurbita, pumpkin, vascular bundle t.s. 31. Epidermis of leaf with stomata and guard cells 32. Syringa, lilac, leaf t.s. 33. Elodea, stem apex l.s. 34. Hyaline cartilage t.s. 35. Compact bone t.s. 36. Smooth muscle l.s. 37. Striated muscle l.s. 38. Heart muscle l.s. 39. Artery t.s. 40. Vein t.s. 41. Human blood smear 42. Lung t.s. 43. Esophagus t.s. 44. Stomach t.s. 45. Small intestine t.s. 46. Small intestine injected to show blood vessels 47. Large intestine t.s. 48. Pancreas t.s. 49. Kidney t.s. 50. Malpighian corpuscle from kidney 51. Ovary with follicles t.s. 52. Testis with spermatogenesis t.s. 53. Thyroid gland t.s. 54. Human scalp l.s. of hair follicles 55. Human finger tip sagittal l.s. 56. Spinal cord t.s. 57. Purkinje cells in t.s. of cerebellum 58. Motor nerve cells 59. Isolated nerve fibres, osmic acid 60. Motor end plates in muscle 61. Insect compound eye, median l.s. 62. Snail, eye l.s. 63. Mammal, eye median sagittal l.s. 64. Retina, t.s. for fine detail 65. Cochlea, median l.s. 66. Taste buds of tongue t.s. 67. Fish, gills t.s. 68. Animal mitosis, various stages 69. Ascaris embryology, cleavage early stage 70. Ascaris embryology, cleavage later stage 71. Sea urchin embryology, two cell stage 72. Sea urchin, four cell stage 73. Sea urchin, morula 74. Sea urchin, blastula 75. Giant chromosomes

HUMAN HISTOLOGY AND PATHOLOGY

No. 3280. Normal Human Histology.

Our series No. 3150 and 100 supply fundamental knowledge of general histology and of the minute structure of the organs of the mammal organism. This series is designed to meet the often expressed demand for an illustration of special human conditions. 58 Color Photomicrographs.

Skeleton: 1. Femur (thigh-bone), t.s. of entire 2. Fibula (calf-bone), t.s. of entire 3. Upper end of tibia (shin-bone), l.s. 4. Joint of finger with joint-capsule, l.s. **Respiratory, circulatory, and lymphatic systems, endocrine glands** 5. Bronchus of lung, l.s. 6. Lung showing alveoli t.s. 7. Blood smear 8. Aorta t.s. shows muscular layers 9. Spleen, t.s. 10. Thymus gland from child, t.s. with Hassall bodies 11. Thyroid gland, t.s. shows colloid 12. Parathyroid gland t.s. 13. Adrenal gland, t.s. cortex and medulla 14. Pituitary gland (Hypophysis), l.s. 15. Pineal body (Epiphysis), t.s. 16. Islets of Langerhans in t.s. of pancreas **Digestive system** 17. Lip, t.s. 18. Incisor tooth, median l.s. 19. Tongue, t.s. showing various papillae 20. Tongue, t.s. showing lingual follicles 21. Parotid gland t.s. 22. Pancreas t.s. 23. Esophagus, t.s. 24. Stomach, fundic region t.s. 25. Duodenum, t.s. with Brunner's glands 26. Jejunum, t.s. 27. Colon t.s. 28. Liver, t.s. for hepatic lobes **Urogenital system** 29. Kidney, t.s. cortex and medulla 30. Ureter t.s. 31. Ovary with follicles t.s. 32. Ovary with Corpus luteum t.s. 33. Fallopian tube t.s. 34. Uterus, secretory phase t.s. 35. Uterus, menstrual phase t.s. 36. Uterus, early post-menstrual phase t.s. 37. Uterus, two weeks post-menstrual phase t.s. 38. Uterus, pregnant t.s. 39. Vagina t.s. 40. Testis, t.s. seminal canals 41. Sperm smear 42. Spermatid duct t.s. **Nervous system and organs of sense** 43. Nervus ischiadicus, t.s. 44. Motor nerve cell with processes 45. Spinal cord, t.s. cervical region 46. Spinal cord, t.s. thoracic region 47. Spinal cord, t.s. lumbar region 48. Ganglion semilunare l.s. 49. Cerebral cortex t.s. 50. Cerebellum t.s. 51. Papilla circumvallata, l.s. to show taste buds 52. Taste buds, t.s. for fine detail 53. Retina with entrance of optic nerve, l.s. **Integument** 54. Skin of finger tip, t.s. 55. Tactile corpuscles in skin of finger l.s. 56. Scalp, showing l.s. of hair follicles 57. Scalp, showing t.s. of hair follicles 58. Mammary gland, active, t.s.

No. 3290. Human Pathology.

Detail and microscopic enlargement of the individual photomicrographs of this series have been selected so as to optimally illustrate the pathological changes in diseased cells, tissues and organs. 50 Color Photomicrographs.

Abnormal alterations of cells and tissues 1. Parenchymatous and fatty degeneration of liver 2. Hemosiderosis of liver 3. Glycogenosis of liver 4. Pigmentary cirrhosis of liver 5. Necrotic esophagitis 6. Foreign body granuloma 7. Tonsillitis 8. Liver cirrhosis **Injury of circulatory organs and blood-forming organs** 9. Adiposis of heart 10. Cardiac callosity 11. Myocarditis chronica acuta recidivans 12. Organized venous thrombosis 13. Infarct of spleen 14. Chronic myeloid leukemia of spleen 15. Malarial melanemia of spleen **Pathologic alterations of lung and liver, tuberculosis, pneumonia** 16. Anthracosis of lung 17. Hemorrhagic infarct of lung 18. Influenzal pneumonia 19. Croupous pneumonia 20. Chronic pneumonia 21. Necrotic (cheesy) pneumonia 22. Miliary tuberculosis of lung 23. Chronic tuberculous pulmonary cavity with bacteria 24. Icterus hepatis **Reactions or kidney after arteriosclerosis, disturbance of metabolism, and inflammation, colitis** 25. Glomerular atrophy of kidney 26. Amyloid degeneration of kidney 27. Acute hemorrhagic nephritis 28. Chronic glomerulonephritis 29. Septic embolic nephritis 30. Colitis dysenterica Shiga-Kruse Specific inflammations after infection with syphilis spirochaetes 31. Congenital syphilis of liver, spirochaetes silvered 32. Congenital syphilis of liver (Feuerstein liver), routine stained 33. Gumma of testicle **Progressive alteration of injured tissues and organs (Hypertrophy and hyperplasia)** 34. Atheroma of head 35. Struma colloidosa 36. Undescended testicle, hyperplasia of Leydig's cells 37. Hypertrophy of the prostate 38. Giant cell sarcoma of maxilla **Benign and malignant tumors** 39. Chondroma of pubic bone 40. Myoma of uterus 41. Fibroadenoma of breast 42. Fibroepithelial mixed tumor of parotid 43. Melanosarcoma of skin 44. Spindle cell sarcoma 45. Carcinoma cervicis uteri 46. Sarcoma of testicle 47. Cystadenoma papilliferum of ovary 48. Gelatinous carcinoma of rectum 49. Lymphosarcoma mediastini 50. Metastatic carcinoma of liver.

HISTOLOGY AND PHYSIOLOGY OF ANIMALS

No. 3150. Comparative Histology and Physiology of Animals.

260 Color Photomicrographs. The complete series consists of 16 partial series which can be delivered individually also.

No. 3151. Animal cell and cell division. 18 Color Photomicrographs

1. Simple animal cells in salamander liver 2. Giant chromosomes from salivary gland of Chironomus 3. Human chromosomes in stage of metaphase 4. Barr bodies 5. Large oocytes in sec. of crayfish liver 6. Yolk granules in eggs of salamander 7. Mature egg cell of mammal 8. Pigment cells in skin of salamander 9. Mitochondria in thin sec. of amphibian liver 10. Golgi apparatus in epithelial cells 11. Metaphase of first cleavage of Ascaris 12. Nuclear spindles in side-view, Astacus 13. Whitefish mitosis, anaphase and telophase 14. Two-cell stage of sea urchin egg 15. Amitosis (direct division) t.s. of liver cell 16. Amoeba proteus, showing amitotic division 17. Syncytium 18. Plasma cells

No. 3152. Epithelial tissues. 9 Color Photomicrographs

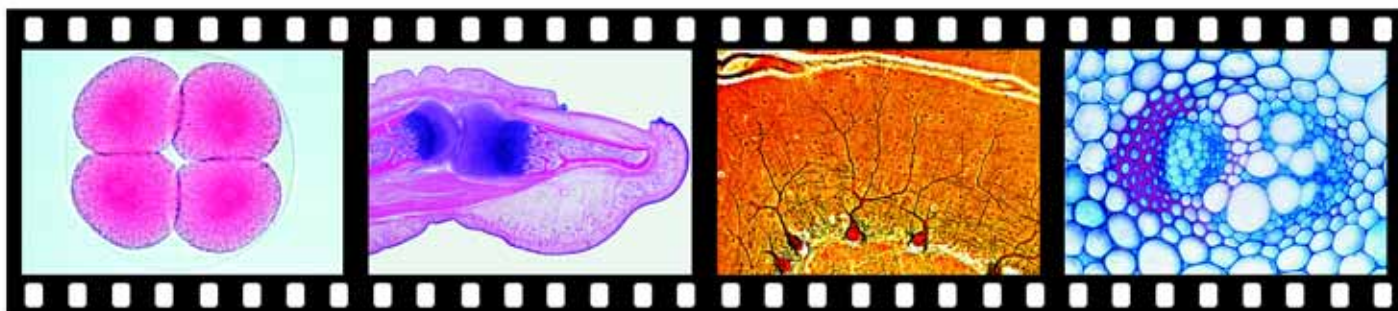
1. Squamous epithelium, isolated 2. Stratified squamous epithelium 3. Intercellular bridges 4. Cuboidal epithelium 5. Simple columnar epithelium 6. Transitional epithelium 7. Ciliated epithelium 8. Endothelial cells, cell walls silver stained 9. Glandular epithelium showing goblet cells

No. 3153. Connective and supporting tissues. 20 Color Photomicrographs

1. Embryonic connective tissue 2. Mucous tissue 3. Reticular tissue, silver stained 4. Areolar connective tissue 5. Lattice fibres, sec. silver stained 6. White fibrous tissue, l.s. of tendon 7. Yellow elastic fibrous tissue 8. Adipose tissue, fat in situ 9. Vesicular tissue 10. Hyaline cartilage, t.s. 11. Yellow elastic cartilage, elastic fibres 12. Fibrocartilage l.s. 13. Compact bone, t.s. Haversian canals 14. Compact bone, l.s. 15. Cancellous bone, t.s. 16. Long hollow bone, entire t.s. 17. Long hollow bone, entire epiphysis l.s. 18. Intracartilaginous ossification 19. Intermembraneous ossification 20. Exoskeleton of arthropods, t.s.

No. 3155. Muscular tissues. 7 Color Photomicrographs

1. Striated muscle, l.s. detail view 2. Striated muscle, t.s. detail view 3. Capillary blood vessels in striated muscle 4. Smooth muscle l.s. detail view 5. Cardiac (heart) muscle l.s. detail view 6. Epithelio-muscular cells of Ascaris 7. Primitive muscle fibres of Hvdra



**No. 3156. Respiratory system.** 17 Color Photomicrographs

1. Gill lamellae of Gammarus 2. Tracheal tubes of insect 3. Spiracle from insect 4. Clam gill, t.s. of gill filaments 5. Air chamber of snail (Helix) 6. Book or trachea lung of spider, l.s. 7. Gill of Branchiostoma, t.s. 8. Gill of fish t.s. 9. Lung of frog (Rana), t.s. sac-like lung 10. Lung of frog, t.s. detail of vessels and epithelium 11. Lung of mammal (cat) t.s. for general study 12. Alveolus of mammalian lung 13. Lung of mammal, elastic fibres 14. Bronchiole, cartilage and artery t.s. 15. Trachea of cat, t.s. general study 16. Wall of trachea, t.s. detail view 17. Larynx of mammal, l.s.

No. 3158. Circulatory and lymphatic systems. 17 Color Photomicrographs

1. Heart of snail, t.s. 2. Vein of mammal, t.s. elastic fibres 3. Artery of mammal, t.s. elastic fibres 4. Artery and vein, t.s. routine stained 5. Human blood smear, high magnification 6. Blood platelets (thrombocytes) in human blood 7. Eosinophilic granulocyte in human blood 8. Frog blood smear 9. Amphiuma blood smear, extra large red blood cells 10. Heart of fish (Cyprinus), l.s. 11. Heart of frog (Rana), l.s. 12. Heart of mouse (Mus), l.s. 13. Spleen of cat, t.s. 14. Malpighian body of spleen 15. Lymph node of mammal, t.s. 16. Red bone marrow with 17. Tonsil, human l.s.

No. 3161. Endocrine glands. 14 color photo micrographs

1. Thyroid gland of mammal, t.s. 2. Parathyroid gland of mammal, t.s. 3. Thymus gland of young cat, t.s. Hassall bodies 4. Pituitary body (hypophysis), human l.s. 5. Adenohypophysis, t.s. for cell types 6. Pineal body (epiphysis), t.s. 7. Adrenal gland of monkey, t.s. general study 8. Adrenal gland of monkey, t.s. detail 9. Islet of Langerhans, t.s. cellular detail 10. Corpus luteum, t.s. 11. Pronephros (head kidney) of fish, t.s. endocrine organ 12. Neurosecretory cells in cerebral ganglion of spider 13. Corpora cardiaca of insect, t.s. storing neurosecretes 14. Corpora allata of insect, t.s. neuroendocrine glands

No. 3162. Digestive system. 32 Color Photomicrographs

1. Amoeba proteus, digesting within food vacuoles 2. Paramecium, food vacuoles stained 3. Hydra, l.s. hypostome and gastrovascular cavity 4. Hydra, l.s. with food 5. Intestinal wall of earthworm 6. Intestine of crayfish, t.s. folds increase surface 7. Intestinal gland of crayfish, t.s. Reabsorption of food 8. Gizzard of cockroach with chitinous teeth 9. Chylus of cockroach, l.s. reabsorption of food 10. Radula of snail, organ of mastication 11. Small intestine of frog, t.s. general view 12. Tongue of cat, l.s. rasping off food material 13. Esophagus of mammal t.s. 14. Stomach of mammal t.s. general view 15. Mucous membrane of stomach, fundic glands 16. Stomach of mammal, injected blood vessels 17. Small intestine, t.s. general view 18. Intestinal villus of duodenum, t.s. detail view 19. Large intestine of mammal, t.s. goblet cells 20. Vermiform appendix, t.s. lymphoid tissue 21. Recto-anal junction, l.s. 22. Liver of pig, t.s. general study 23. Kupffer's star cells with phagocytosis 24. Storage of glycogen in liver cells 25. Submandibular gland 26. Pancreas, t.s. serous gland 27. Small intestine of dog, injected blood vessels 28. Tooth development, l.s. 29. Human tooth in gum, l.s. 30. Human tooth (molar), l.s. 31. Human tooth, ground 32. Gum with root of tooth, t.s.

No. 3165. Excretory system. 13 Color Photomicrographs

1. Nephrostome of nephridium from earthworm 2. Kidney of snail, t.s. 3. Malpighian tubules of insect t.s. 4. Kidney of newt, primordial kidney, t.s. 5. Nephrostome with ciliated funnel in kidney of frog 6. Kidney of mouse, l.s. complete organ 7. Malpighian corpuscle of mammalian kidney 8. Kidney of mammal, t.s. of cortex 9. Ditto. t.s. of marrow 10. Ditto. t.s. injected blood vessels 11. Ditto. t.s. to show storage 12. Urinary bladder of rabbit, t.s. 13. Ureter of rabbit, t.s.

No. 3167. Reproductive system. 24 Color Photomicrographs

1. Paramecium in binary fission 2. Paramecium in conjugation 3. Hydra with bud, w.m. Asexual reproduction 4. Regeneration of Hydra 5. Hermaphrodite gland of snail 6. Uterus of Ascaris, t.s. stages of embryology 7. Ovary of mammal, t.s. primary follicles 8. Ditto. t.s. developing follicle 9. Ditto. t.s. mature Graafian follicle 10. Ditto. t.s. ruptured Graafian follicle 11. Testis of mammal, t.s. general view 12. Ditto. t.s. spermatogenesis 13. Epididymis of mammal, t.s. 14. Mature spermatozoa of bull 15. Fallopian tube of mammal t.s. 16. Uterus of mammal, resting stage t.s. 17. Placenta of pig, t.s. 18. Uterus of mouse with embryo, t.s. general view 19. Ditto. l.s. of navel string 20. Navel string of calf, t.s. 21. Prostate gland of monkey, t.s. 22. Seminal vesicle of mammal, t.s. 23. Penis of pig, t.s. 24. Vagina of pig, t.s.

No. 3171. Nervous system. 25 Color Photomicrographs

1. Paramecium neuromotor system 2. Ventral nerve cord of earthworm, t.s. 3. Brain of insect, frontal section. 4. Giant nerve fibres of Sepia 5. Brain of frog, t.s. 6. Motor nerve cell 7. Nerve cells, t.s. Nissl's granules 8. Sympathetic ganglion, t.s. 9. Medullated nerve fibres, l.s. of Ranvier's nodes 10. Peripheral nerve, t.s. 11. Cerebrum of mammal, t.s. of cortex 12. Pyramidal cells silvered 13. Cerebellum of mammal, t.s. 14. Purkinje cells silvered 15. Brain of mouse, sagittal section 16. Brain of mouse, horizontal section 17. Spinal cord of mammal, t.s. 18. Spinal cord, t.s. nerve cells silvered 19. Spinal cord with ganglia 20. Optic nerve of

monkey, t.s. 21. Neuroglia, silvered 22. Motor innervation of muscle, general survey 23. Motor nerve endings in striated muscle 24. Muscle spindle, t.s. 25. Corpuscle of Herbst, l.s.

No. 3172. Light-perceptive organs. 23 Color Photomicrographs

1. Eyespot of Planaria 2. Eyespot of leech 3. Eye and brain of Nereis l.s. 4. Eye of clam (Pecten), l.s. 5. Compound eye of an insect, l.s. 6. Eye of May fly, l.s. superposed eye 7. Ommatidia of insect l.s. 8. Cornea of insect eye, w.m. facets 9. Ocelli of insect, l.s. 10. Eye of spider (Salticus), l.s. 11. Camera eye of cephalopode (Sepia), l.s. 12. Retina of cephalopode, t.s. detail 13. Simple eye of marine snail (Patella), l.s. 14. Pinhole camera eye of marine snail (Haliotis), l.s. 15. Eye of snail (Helix), l.s. 16. Eyespots of Branchiostoma t.s. 17. Eye of mammal, median sagittal l.s. 18. Retina of monkey, t.s. 19. Retina of mammal, horizontal section 20. Cornea of mammal, t.s. 21. Developing eyes of mammal, l.s. 22. Yellow spot in human retina, t.s. 23. Parietal or pineal eye, l.s. head of lizard

No. 3174. Organs of hearing and equilibration. 9 Color Photomicrographs

1. Johnston's organ, l.s. insect auditory organ 2. Antenna of fly (Brachycera), speed indicator 3. Leg of locust with organ of hearing 4. Chordotonal organ in l.s. leg of insect 5. Internal ear of mammal l.s. 6. Organ of Corti, t.s. 7. Statocyst of a crustacean 8. Organ of balance from frog, macula 9. Lateral-line organ of fish, t.s.

No. 3175. Tactile organs. 4 Color Photomicrographs

1. Pacinian corpuscle l.s. 2. Corpuscles of Herbst and Grandry 3. Tactile hair, l.s. mammalian mouth 4. Corpuscle of Eimer in mouth of mole, l.s.

No. 3176. Organs of taste and smell. 8 Color Photomicrographs

1. Olfactory organs of insect antenna 2. Organ of Jakobson in l.s. head of lizard 3. Nasal region of mouse, t.s. 4. Olfactory region of mammal, t.s. 5. Tongue of rabbit, t.s. papilla foliata 6. Taste bud, detail 7. Wallate papilla of human tongue, l.s. 8. Barbel of fish, t.s.

No. 3177. Integument (skin). 20 Color Photomicrographs

1. Skin of dogfish, t.s. placoid scales 2. Skin of frog, t.s. 3. Skin of salamander, t.s. 4. Skin of lizard, t.s. scales 5. Skin of bird, t.s. feather development 6. Human skin from finger tip, t.s. general view 7. Ditto. t.s. of zone of keratinization 8. Human skin from body, negro, t.s. 9. Human skin from body, t.s. injected blood vessels 10. Human scalp, l.s. of a hair follicle 11. Human scalp, l.s. hair shaft 12. Human scalp, l.s. hair bulb 13. Human scalp, t.s. of hair bulbs, general view 14. Human scalp, t.s. hair follicle, detail 15. Human scalp, l.s. injected blood vessels 16. Scalp from human fetus l.s. hair development 17. Nail development of human embryo, l.s. 18. Eyelid, l.s. 19. Hoof development, l.s. calf embryo 20. Mammary gland, t.s.

ZOOLOGY

No. 3200. The Characteristic Structure and Histology of Animals.

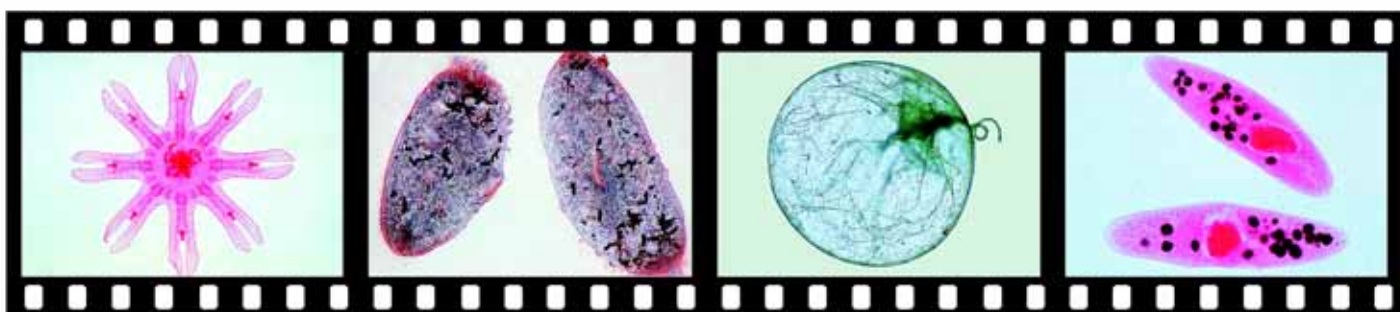
This collection is designed to illustrate zoological classification by using typical representatives from each phylum. 314 Color Photomicrographs. *The complete series consists of 17 partial series which can be delivered individually also.*

No. 3201. Protozoa. 17 Color Photomicrographs

1. Amoeba proteus 2. Arcella, shelled ameba 3. Radiolaria, different forms 4. Foraminifera, different forms 5. Noctiluca miliaris, marine phosphorescence 6. Ceratium hirundinella, dinoflagellate 7. Trypanosoma lewisi, blood flagellates, smear 8. Plasmodium berghei, blood parasite, smear 9. Gregarina from mealworm intestine, l.s. 10. Paramecium, general structure 11. Paramecium, pellicle structures 12. Paramecium, discharged trichocysts 13. Opalina ranarum, in frog intestine 14. Spirostomum, ciliate with large nucleus 15. Stylylonchia, ciliate from hay infusions 16. Euplotes, stained for cilia 17. Vorticella, stalked ciliate

No. 3203. Porifera and Coelenterata. 22 Color Photomicrographs

1. Sycon, marine sponge, l.s. 2. Sycon, t.s. 3. Sycon, calcareous spicules 4. Sycon, development 5. Euspongia, skeleton 6. Spongilla, winter bodies (gemmulae) 7. Hydra, w.m. 8. Hydra, t.s. 9. Hydra, male with testis t.s. 10. Hydra, female with ovary t.s. 11. Hydra, w.m. of male and female 12. Obelia hydroid, colony 13. Obelia medusa 14. Aurelia, ephyra 15. Actinia, sea anemone, t.s. 16. Actinia, l.s. 17. Nematocysts and zoochlorellae of sea anemone 18. Sertularia cupressina 19. Plumularia setacea 20. Campanularia johnstoni 21. Tubularia larynx, l.s. of polyp 22. Dicyema, simple from Sepia





No. 3205. Platyhelminthes and Aschelminthes. 8 Color Photomicrographs
1. Planaria, w.m. 2. Planaria, t.s. region of pharynx 3. Planaria, t.s. region of gonads 4. Dicrocoelium lanceolatum, sheep liver fluke, w.m. 5. Fasciola hepatica, beef liver fluke, w.m. excretory system 6. Ascaris megalocephala, t.s. female 7. Ascaris megalocephala, t.s. region of esophagus 8. Taenia saginata, tapeworm, t.s. of proglottid

No. 3206. Annelida and various species. 20 Color Photomicrographs
1. Nereis, polychaete worm, t.s. 2. Nereis, parapodium 3. Hirudo, leech, t.s. 4. Hirudo, l.s. oral sucker 5. Hirudo, l.s. posterior sucker 6. Lumbricus, earthworm, t.s. typhlosole 7. Lumbricus, l.s. of setae 8. Lumbricus, mouth region with pharynx t.s. 9. Lumbricus, sec. ovary 10. Lumbricus, sec. testis 11. Lumbricus, sec. seminal vesicles 12. Lumbricus, t.s. clitellum 13. Lumbricus, l.s. 1st to 9th segment 14. Lumbricus, l.s. 9th to 16th segment 15. Lumbricus, l.s. 16th to 23rd segment 16. Lumbricus, sperm smear 17. Plumatella, moss animal 18. Plumatella, statoblasts 19. Membraniphora, marine moss animals 20. Peripatus, body t.s.

No. 3209. Crustacea. 22 Color Photomicrographs
1. Daphnia, water flea 2. Daphnia, ephippia 3. Cyclops, copepod with egg sacs 4. Cyclops, nauplius larva 5. Caprella, marine amphipod 6. Leptodora, cladoceran 7. Bythotrephes, cladoceran 8. Polyphemus, predaceous cladoceran 9. Gammarus, fresh water amphipod 10. Carcinus, crab, zoea 11. Carcinus, megalopa 12. Astacus, crayfish, l.s. compound eye 13. Astacus, gills t.s. 14. Astacus, antenna t.s. 15. Astacus, green gland t.s. 16. Astacus, stomach t.s. 17. Astacus, ovary t.s. large oocytes 18. Astacus, testis t.s. spermatogenesis 19. Astacus, liver t.s. 20. Astacus, intestine t.s. 21. Balanus, barnacle, nauplius larva 22. Balanus, cypris

No. 3212. Arachnida and Myriapoda. 22 Color Photomicrographs
1. Spider, young specimen 2. Spider, leg 3. Spider, comb of leg 4. Spider, spinneret 5. Spider, l.s. of spinneret 6. Spider, l.s. of spinning gland 7. Spider, l.s. abdomen 8. Spider, mouth parts with chelicerae 9. Spider, pedipalpus of male 10. Spider, epigyne of female 11. Spider, t.s. of nervous system 12. Scorpion, young specimen 13. Scorpion, l.s. young specimen 14. Scorpion, poison gland 15. Ixodes, tick, mouth parts 16. Tyroglyphus, mite from meal 17. Chelifer, book scorpion, adult 18. Scolopendra, centipede, t.s. body 19. Lithobius, head with poison fangs 20. Julus, millipede, t.s. body 21. Julus, head with mouth parts 22. Julus, diplosegment with legs

No. 3214. Insecta, head and mouth parts. 19 Color Photomicrographs
1. Musca domestica, house fly, head with sucking tube 2. Pieris brassicae, butterfly, proboscis 3. Culex pipiens, mosquito, mouth parts of female 4. Pyrrhocoris, bug, mouth parts 5. Vespa, wasp, mouth parts of carnivore 6. Blatta, cockroach, mouth parts of herbivore 7. Melolontha, cockchafer, mouth parts dissected 8. Bombyx mori, silkworm moth, mouth parts 9. Pieris brassicae, mouth parts of larva 10. Apis mellifica, honey bee, mouth parts of worker 11. Apis mellifica, t.s. mouth parts 12. Apis mellifica, mouth parts of drone 13. Stomoxys calcitrans, stable fly, mouth parts 14. Chrysozona, gadfly, mouth parts 15. Pulex, flea, mouth parts with stylets 16. Carabus, beetle, mouth parts of carnivore 17. Curculionidae, weevil, head with mouth parts 18. Odonata, dragonfly, mouth parts of larva 19. Corethra, gnat, mouth parts of larva

No. 3215. Insecta, antennae, legs, wings, internal organs. 41 Color Photomicrographs
1. Carabus, beetle, filiform antenna 2. Melolontha, cockchafer, laminate antenna 3. Pieris brassicae, butterfly, clubbed antenna 4. Chironomus, gnat, antenna with Johnston's organ 5. Gyrinus, whirling beetle, antenna 6. Bombyx mori, silkworm moth, feathered antenna 7. Apis mellifica, honey bee, foreleg 8. Apis mellifica, hind leg 9. Melolontha, cockchafer, digging leg 10. Mantis religiosa, praying mantis, grasping leg 11. Reduviidae, bug, raptorial leg 12. Corixa, aquatic insect, swimming leg 13. Grasshopper, leg with stridulatory organ 14. Musca domestica, leg with pulvilli 15. Apis mellifica, wings 16. Musca domestica, wing with halteres 17. Odonata, dragonfly, wings 18. Chrysopa, neuroptera wing 19. Forficula, earwig, folded wing 20. Periplaneta, cockroach, chitinous and membranous wings 21. Pieris, butterfly, wing with scales 22. Butterfly, wing showing frenulum 23. Apis, sting with poison sac 24. Apis, wax plate 25. Periplaneta, gizzard 26. Carabus, beetle, t.s. of gizzard 27. Trachea in insect intestine 28. Apis, head eyes and brain, t.s. 29. Apis, eye with optic ganglion, l.s. 30. Apis, ocelli 31. Melolontha, l.s. compound eye, ommatidia 32. Carausius, t.s. abdomen 33. Insect Malpighian tubules, l.s. 34. Insect rectum with ampullae, t.s. 35. Grasshopper, t.s. of testis spermatogenesis 36. Insect striated muscle, l.s. 37. Apis, t.s. abdomen of queen with ovaries 38. Apis, t.s. abdomen of drone with testis 39. Ovary of insect with panoistic egg tubes l.s. 40. Ditto. telotrophic egg tubes l.s. 41. Ditto. polytrophic egg tubes l.s.

No. 3216. Insecta, whole mounts of entire insects. 13 Color Photomicrographs
1. Drosophila, fruit fly, adult 2. Drosophila, l.s. of adult 3. Drosophila, larva 4. Ephemeroptera, May fly, adult 5. Ephemeroptera, nymph 6. Ephemeroptera, larva

7. Embia sp., adult 8. Nemura, stone-fly, adult 9. Isoptera, termite, worker 10. Isoptera, termite, soldier 11. Formicidae, ant, worker 12. Colembola, springtail, adult 13. Thysanoptera, thrips, adult

No. 3218. Mollusca. 20 Color Photomicrographs
1. Chiton, marine mollusc, t.s. 2. Snail, t.s. through body of small specimen 3. Snail, l.s. through head 4. Alloteuthis, cuttlefish, young specimen w.m 5. Alloteuthis, horizontal sec. young specimen 6. Alloteuthis, t.s. of suctorial disc 7. Helix pomatia, snail, foot t.s. 8. Helix, stomach with glands t.s. 9. Helix, liver t.s. 10. Helix, hermaphrodite gland t.s. 11. Helix, flagellum t.s. 12. Helix, spermatid t.s. 13. Helix, dart 14. Helix, eye l.s. 15. Anodonta, fresh water mussel, glochidia larva 16. Dreissena, mussel, veliger larva 17. Pisidium, fresh water mussel, t.s. with embryos 18. Pisidium, t.s. formation of shell 19. Shell of mussel ground thin, prismatic calcareous layer 20. Dreissena, mussel, t.s.

No. 3220. Echinodermata. 10 Color Photomicrographs
1. Asterias, starfish, small specimen w.m. 2. Asterias, t.s. of arm 3. Asterias, bipinnaria larva 4. Asterias, pedicellaria 5. Asterias, horizontal section young specimen 6. Asterias, regeneration 7. Psammechinus, sea urchin, l.s. 8. Psammechinus, pluteus larva 9. Balanoglossus, acorn worm, t.s. 10. Balanoglossus, tornaria larva

No. 3222. Acrania and Tunicata. 14 Color Photomicrographs
1. Branchiostoma lanceolatum (Amphioxus), w.m. adult 2. Ditto. w.m. young larva 3. Ditto. anterior end of adult l.s. 4. Ditto. mouth region t.s. 5. Ditto. anterior pharynx t.s. 6. Ditto. t.s. of male 7. Ditto. t.s. of female 8. Ditto. region of intestine t.s. 9. Ditto. typical t.s. through midbody 10. Ditto. t.s. of endostyle, detail 11. Ascidia, sea squirt, region of gills t.s. 12. Ascidia, general body plan 13. Salpa, asexual form 14. Salpa, sexual form

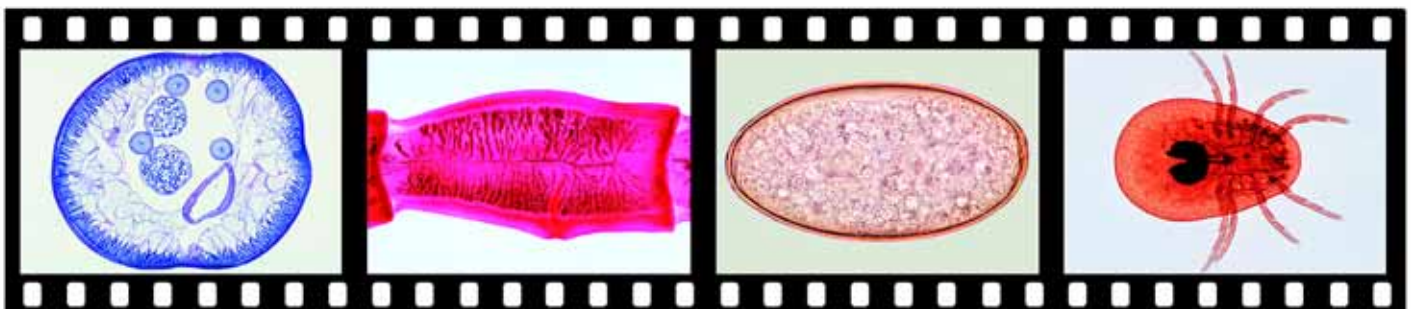
No. 3224. Pisces. 27 Color Photomicrographs
1. Petromyzon, lamprey, region of gills t.s. 2. Petromyzon, lamprey, region of abdomen t.s. 3. Scyllium, dogfish, t.s. young in region of gills 4. Scyllium, t.s. young in region of spiral intestine 5. Fresh water fish (small specimen), region of mouth t.s. 6. Ditto. tooth development 7. Ditto. t.s. head and eyes 8. Ditto. l.s. through head 9. Ditto. region of gills t.s. 10. Ditto. region of abdomen t.s. 11. Cyprinus, carp, skin t.s. 12. Cyprinus, liver t.s. 13. Cyprinus, small intestine t.s. 14. Cyprinus, testis with spermatozoa t.s. 15. Cyprinus, ovary with ova t.s. 16. Cyprinus, kidney t.s. 17. Cyprinus, air bladder t.s. 18. Cyprinus, brain, t.s. 19. Cyprinus, gill arch t.s. 20. Cyprinus, blood smear 21. Torpedo marmorata, t.s. electric organ 22. Hippocampus, sea horse, agglomerulous kidney t.s. 23. Elasmobranchii, cartilaginous fish, horizontal sec. of head 24. Teleostei, bony fish, horizontal sec. of head 25. Cycloid scale 26. Ctenoid scale 27. Placoid scale

No. 3227. Amphibia. 24 Color Photomicrographs
1. Salamandra larva, head and eyes t.s. 2. Salamandra larva, external gills t.s. 3. Salamandra larva, abdomen t.s. 4. Salamandra, adult, ovary t.s. 5. Salamandra, testis t.s. spermatogenesis 6. Salamandra, blood smear large erythrocytes 7. Rana, frog, blood smear 8. Rana, tongue l.s. 9. Rana, esophagus t.s. 10. Rana, stomach t.s. 11. Rana, small intestine t.s. 12. Rana, large intestine t.s. 13. Rana, liver t.s. bile ducts 14. Rana, pancreas t.s. 15. Rana, spleen t.s. 16. Rana, lung t.s., sac-like 17. Rana, kidney t.s. 18. Rana, ovary t.s. follicles 19. Rana, fallopian tube t.s. 20. Rana, testis t.s. spermatogenesis 21. Rana, spinal cord t.s. 22. Rana, brain l.s. 23. Rana, retina t.s. 24. Rana, skin t.s.

No. 3231. Reptilia. 7 Color Photomicrographs
1. Lacerta, lizard, skin, l.s. 2. Lacerta, t.s. young specimen 3. Lacerta, t.s. of jaw, changing of teeth 4. Lacerta, l.s. of brain 5. Lacerta, l.s. of heart 6. Lacerta, gland pore on femur of male, l.s. 7. Lacerta, blood smear

No. 3233. Aves. 20 Color Photomicrographs
1. Gallus, chicken, blood smear 2. Gallus, lung t.s. parabronchi 3. Gallus, glandular stomach t.s. 4. Gallus, gizzard t.s. 5. Gallus, ovary t.s. 6. Gallus, liver t.s. 7. Gallus, kidney t.s. 8. Gallus, tongue t.s. 9. Gallus, retina t.s. pecten 10. Gallus, skin of foot, t.s. 11. Gallus, skin of body, l.s. feather development 12. Gallus, skin of body, t.s. feather quills 13. Gallus, vane feather 14. Gallus, down feather 15. Gallus, plume feather 16. Gallus, chick embryo t.s. 24 hour 17. Gallus, chick embryo t.s. 72 hour 18. Bird brain, l.s. of 19. Young bird, l.s. of head and bill 20. Singing bird, l.s. of syrinx

No. 3236. Mammalia. 8 Color Photomicrographs
1. Young mouse, median sagittal l.s. entire specimen 2. Young mouse, horizontal l.s. entire specimen 3. Young mouse, median sagittal l.s. of head 4. Young mouse, thorax t.s. 5. Young mouse, abdomen t.s. 6. Young mouse, leg t.s. 7. Young mouse, l.s. through female gonads 8. Young mouse, l.s. through male gonads



PARASITOLOGY

No. 3250. Parasites and Pathogenic Bacteria.

164 Color Photomicrographs. *The complete series consists of 4 partial series which can be delivered individually also.*

No. 3251. Protozoa. 35 Color Photomicrographs

1. Entamoeba histolytica, vegetative 2. Entamoeba histolytica, infected intestine t.s. 3. Entamoeba histolytica, diseased liver t.s. 4. Entamoeba coli, smear from faeces 5. Lamblia (Giardia) intestinalis, vegetative 6. Trichomonas, smear 7. Trypanosoma gambiense, blood smear 8. Trypanosoma cruzi, Chagas disease, blood smear 9. Trypanosoma cruzi, t.s. of infected heart muscle 10. Trypanosoma brucei, nagana, blood smear 11. Trypanosoma equiperdum, dourine, blood smear 12. Leishmania donovani, Kala-azar, smear from spleen 13. Plasmodium falciparum, malaria, ring stages 14. Plasmodium falciparum, gametocytes 15. Plasmodium vivax, malaria, ring stages and merozoites 16. Plasmodium malariae, malaria, blood smear 17. Plasmodium berghel, schizogony stages 18. Plasmodium, exflagellation of microgametes 19. Plasmodium, mosquito stomach with oocysts 20. Plasmodium, salivary gland of mosquito with sporozoites 21. Plasmodium, exo-erythrocytic stages 22. Plasmodium gallinaceum, chicken malaria, blood smear 23. Plasmodium cathemerium, bird malaria, blood smear 24. Leucocytozoon, bird malaria, infected lymphocytes 25. Haemoproteus columbae, pigeon malaria, blood smear 26. Nosema apis, honey bee dysentery 27. Monocystis lumbrici, from seminal vesicles of earthworm 28. Gregarina, from mealworm intestine 29. Eimeria stiedae, coccidiosis, section of liver 30. Babesia canis, piroplasmosis, blood smear 31. Toxoplasma gondii, smear from tissue 32. Toxoplasma gondii, t.s. with parasite cysts 33. Sarcocystis tenella, section of Miescher's tubes 34. Trichodina domerguel, ciliate on fish gills 35. Balantidium coli, in human colon

No. 3255. Platyhelminthes. 44 Color Photomicrographs

1. Dicrocoelium lanceolatum, sheep liver fluke, w.m. 2. Fasciola hepatica, beef liver fluke, w.m. 3. Ditto. l.s. of anterior end 4. Ditto. t.s. of body 5. Ditto. ova 6. Ditto. miracidium 7. Ditto. t.s. of snail liver with sporocysts 8. Ditto. sporocyst with redia 9. Ditto. redia with cercaria 10. Ditto. cercaria 11. Clonorchis sinensis, Chinese liver fluke, w.m. 12. Opisthorchis felinus, cat liver fluke, w.m. 13. Schistosoma mansoni, bilharzia, male w.m. 14. Ditto. female w.m. 15. Ditto. male and female in copula w.m. 16. Ditto. t.s. of vein with parasites 17. Ditto. cercaria 18. Ditto. infected intestine with ova t.s. 19. Ditto. ova with subterminal spine 20. Schistosoma haematobium. ova with terminal spine 21. Schistosoma japonicum, ova without spine 22. Heterophyes heterophyes, w.m. 23. Pseudamphistomum truncatum, fluke found in cats, w.m. 24. Ditto. ova in faeces 25. Taenia saginata, tapeworm, scolex without hooklets 26. Ditto. mature proglottid w.m. 27. Ditto. proglottid t.s. 28. Taenia solium, tapeworm, scolex with hooklets 29. Taenia solium cysticercus, bladderworm 30. Taenia saginata, ova embryos 31. Taenia pisiformis, dog tapeworm, scolex 32. Ditto. immature proglottid w.m. 33. Ditto. mature proglottid w.m. 34. Ditto. gravid proglottid w.m. 35. Cysticercus pisiformis, bladderworm, section 36. Dipylidium caninum, scolex w.m. 37. Ditto. proglottid w.m. 38. Hymenolepis nana, dwarf tapeworm, scolex w.m. 39. Ditto. proglottids w.m. 40. Echinococcus granulosus, dog tapeworm, w.m. 41. Ditto. t.s. of hydatid cyst 42. Ditto. ova from faeces of dog 43. Diphylobothrium latum, broad tapeworm, proglottid w.m. 44. Moniezia expansa, sheep tapeworm, proglottid w.m.

No. 3261. Nematelminthes. 23 Color Photomicrographs

1. Ascaris lumbricoides, roundworm, t.s. of female 2. Ditto. t.s. of male 3. Ditto. ova 4. Enterobius vermicularis (Oxyuris), pin worm, female w.m. 5. Ditto., ovum 6. Trichuris trichiura, whip worm, w.m. 7. Ditto. intestine of dog with worms, t.s. 8. Ditto. ovum 9. Trichinella spiralis, adult female w.m. 10. Ditto. adult male w.m. 11. Ditto. muscle with encysted larvae l.s. 12. Ditto. infected muscle piece w.m. 13. Ditto. t.s. passing the intestinal wall 14. Ancylostoma duodenale, hookworm, posterior end of male w.m. 15. Ditto. female w.m. 16. Ditto. male and female in copula w.m. 17. Ditto. t.s. of female 18. Ditto. ovum 19. Necator americanus, American hookworm, male w.m. 20. Ditto. female w.m. 21. Strongyloides, roundworm, larvae 22. Onchocerca volvulus, sec. of tumor 23. Heterakis spumosa, intestinal worm of chicken, w.m.

No. 3265. Arthropoda. 38 Color Photomicrographs

1. Argas persicus, fowl tick, adult 2. Argas persicus, six legged larva 3. Ixodes, tick, mouth parts of larva 4. Dermacentor andersoni, tick 5. Demodex folliculorum, follicle mite, sec. of skin 6. Dermanyssus gallinae, chicken mite 7. Sarcoptes scabiei, itch mite, sec. of skin 8. Lipoptena cervi, louse fly 9. Pediculus capitis, head louse 10. Haematopinus suis, pig louse 11. Phthirus pubis, crab louse 12. Phthirus pubis, eggs attached to hair 13. Cimex lectularius, bed bug 14. Culex pipiens, common mosquito, female 15. Ditto. head and mouth parts of female 16. Ditto. male 17. Ditto. head and mouth parts of male 18. Ditto. t.s. mouth parts of

female 19. Ditto. pupa 20. Ditto. posterior end of larva 21. Ditto. eggs 22. Anopheles, malaria mosquito, female 23. Ditto. head and mouth parts of female 24. Ditto. male 25. Ditto. head and mouth parts of male 26. Ditto. pupa 27. Ditto. posterior end of larva 28. Ditto. eggs 29. Pulex irritans, human flea, female 30. Ditto. male 31. Xenopsylla cheopis, rat flea, female 32. Ditto. male 33. Ctenocephalus canis, dog flea, female 34. Ditto. male 35. Nosopsyllus fasciatus, rat flea, female 36. Ditto. male 37. Ceratophyllus gallinulae, chicken flea, female 38. male

No. 3271. Pathogenic Bacteria. 24 Color Photomicrographs

1. Neisseria gonorrhoeae, gonorrhoea 2. Staphylococcus aureus, pus organism 3. Streptococcus pyogenes, smear from pus 4. Gaffky tetragen, meningitis 5. Bacillus anthracis, wool sorters disease 6. Bacillus anthracis, spores stained 7. Clostridium septicum, spores stained 8. Clostridium tetani, lockjaw, terminal spores 9. Clostridium perfringens, central spores 10. Mycobacterium tuberculosis, smear from positive sputum 11. Mycobacterium leprae, leprosy, smear from lesion 12. Corynebacterium diphtheriae 13. Bacterium erysipelas, erysipelas 14. Eberthella typhi, typhoid fever 15. Salmonella paratyphi, paratyphoid fever 16. Salmonella enteritidis, meat poisoning 17. Vibrio comma, Asiatic cholera 18. Klebsiella pneumoniae, pneumonia, capsules 19. Pasteurella pestis, plague 20. Hemophilus influenzae, smear 21. Bacteria of caries l.s. of diseased human tooth 22. Actinomyces, lumpy jaw 23. Spirochaeta duttoni, relapsing fever, blood smear 24. Treponema pallidum, sec. of syphilitic lesion, silver staining

EMBRYOLOGY OF ANIMALS

No. 3310. The Sea Urchin Embryology (Psammechinus miliaris).

25 Color Photomicrographs

1. Uncleaved egg, early stage 2. Uncleaved egg, before fertilization 3. Uncleaved egg, after fertilization 4. Two-cell stage 5. Telophase of the second cleavage 6. Four-cell stage, polar view 7. Telophase of the third cleavage 8. Eight-cell stage, vegetal pole view 9. Fourth cleavage 10. Sixteen-cell stage 11. Ditto. side view 12. Ditto. animal polar view 13. Fifth cleavage 14. Thirtytwo-cell stage, polar view 15. Sixtyfour-cell stage, side view 16. Later morula stage 17. Blastula stage, side view 18. Later blastula 19. Beginning gastrulation 20. Later gastrula 21. Later gastrula, details of cilia 22. Late gastrula, secondary mesenchyma 23. Young pluteus larva, oral pit 24. Young pluteus larva, intestinal system 25. Pluteus larva, side view

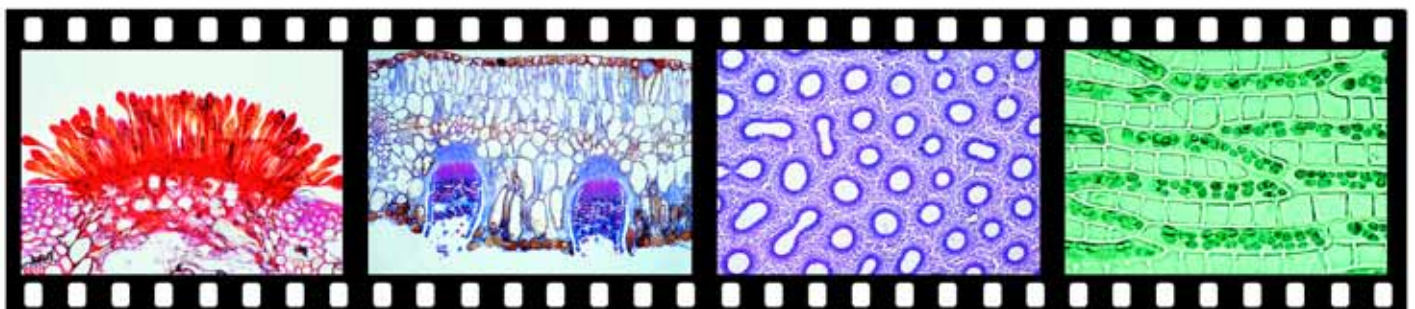
No. 733. Embryonic Development of the Newt (Triturus).

Compilation: Martin Kuhn. 60 Projection Slides

1. Uncleaved egg, view to animal pole 2. Uncleaved egg, view to vegetative pole 3. Two-cell stage 4. The cleavage divisions, schematic design 5. Two-cell stage 6. Four-cell stage 7. Eight-cell stage l.s. 8. Sixteen-cell stage l.s. 9. Thirty-two-cell stage 10. Sixty-four-cell stage, darkfield view 11. Morula, darkfield view 12. Morula, l.s. 13. Blastula, darkfield view 14. Ditto. l.s. 15. The gastrulation. Schematic designs of stages 16. Early gastrula 17. Ditto. l.s. 18. Ditto. blastopore sickle-shaped 19. Middle gastrula, blastopore semicircular 20. Ditto. yolk plug 21. Ditto. frontal sec. 22. Late gastrula, blastopore slit-shaped 23. Ditto. l.s. 24. The neurulation. Schematic designs of stages 25. Early neurula, neural plate in abdominal region 26. Ditto. neural plate in region of head 27. Ditto. l.s. 28. Middle neurula 29. Ditto. detail view t.s. neural plate 30. Ditto. neural folds get closer 31. Late neurula, neural folds nearly closed 32. Ditto. neural folds are closed 33. Ditto. detail view t.s. neural tube 34. Schematic design of the early gastrula 35. Early tail bud stage, head and tailbud 36. Ditto. darkfield view 37. Ditto. primordia of eyes 38. Ditto. eye cleft, darkfield view 39. Middle tail bud stage, primordia of gills 40. Ditto. leg bud 41. Late tail bud stage, ventral view 42. Ditto. early gills and leg bud 43. Early larva 44. Ditto. t.s. in region of eyes 45. Ditto. t.s. in region of ears 46. Ditto. t.s. in region of leg buds 47. One toed larva, side view 48. Ditto. ventral view 49. Ditto. t.s. region of eyes 50. Ditto. t.s. region of ears 51. Ditto. t.s. region of heart 52. Ditto. t.s. region of stomach 53. Ditto. t.s. region of leg buds 54. Ditto. t.s. middle of trunk 55. Ditto. t.s. anal region 56. Ditto. t.s. tail 57. Two toed larva, pigmentation adapted to light 58. Two toed larva, frontal sec. eye region 59. Four toed larva, total view 60. Three toed larva, frontal sec. of intestinal tract

No. 3320. The Frog Embryology (Rana sp.). 20 Color Photomicrographs

1. Egg, two-cell stage t.s. 2. Egg, four-cell stage t.s. 3. Egg, eight-cell stage l.s. 4. Morula l.s. 5. Blastula l.s. 6. Early gastrula l.s. 7. Late gastrula l.s. 8. Early neurula t.s. 9. Late neurula t.s. neural tube 10. Tail bud stage, t.s. 11. Ditto. l.s. 12. Ditto. parasagittal l.s. 13. Hatching stage of embryo, t.s. head 14. Ditto. t.s. region of heart 15. Ditto. t.s. region of abdomen 16. Newly hatched larva, l.s. 17. Ditto. parasagittal l.s. 18. Young tadpole, t.s. of head 19. Ditto. t.s. region of gills 20. Ditto. t.s. of abdomen



**No. 3330. The Chicken Embryology (*Gallus domesticus*).**

20 Color Photomicrographs
 1. 6 hour, l.s. 2. 18 hour, w.m. 3. 24 hour, w.m. 4. 24 hour, t.s. primitive groove 5. 24 hour, t.s. neural plate 6. 28 hour, w.m. 10 somites 7. 36 hour, t.s. posterior region of abdomen 8. 36 hour, t.s. of anterior region of abdomen 9. 36 hour, t.s. region of heart 10. 40 hour, w.m. 15 somites 11. 45 hour, l.s. 12. 48 hour, t.s. of abdomen 13. 50 hour, w.m. 14. 72 hour, w.m. blood vascular system injected 15. 72 hour, t.s. posterior region of abdomen 16. 72 hour, t.s. region of head 17. 96 hour, t.s. anterior region of abdomen 18. 96 hour, t.s. region of heart 19. 5 day, w.m. 20. 8 day, l.s.

No. 3360. Development of Follicles in Mammalian Ovary.

12 Color Photomicrographs
 1. Ovary t.s. for general study 2. Young primary follicles t.s. 3. Older primary follicle t.s. 4. Secondary follicle t.s. 5. Young Graafian follicle, l.s. 6. Older Graafian follicle, l.s. 7. Mature Graafian follicle, l.s. 8. Mature oocyte t.s. 9. Ruptured Graafian follicle l.s. 10. Fallopian tube with embedded oocyte, t.s. low magnification 11. Ditto. t.s. detail 12. Ovary with Corpus luteum, t.s.

No. 3340. The Eye Development in Vertebrates (Frog).

10 Color Photomicrographs
 1. Early neurula, t.s. two pigmented grooves 2. Medium neurula, t.s. later stage 3. Later neurula, t.s. optic vesicles 4. Ditto. growing optic vesicles 5. Tail bud stage, t.s. formation of lens plate 6. Formation of the optic cup 7. Hatching larva, t.s. optic cup, optic stalk, brain 8. Fetal eye, l.s. entrance of mesenchyma and artery 9. Eye of young tadpole, l.s. differentiation of lens and retina 10. Eye of older tadpole, l.s. of fully developed eye

No. 3350. The Tooth Development. 10 Color Photomicrographs

1. Early stage showing dental ridge l.s. 2. Young dental sac with bell-shaped enamel organ l.s. 3. Ditto. before formation of dentine and enamel 4. Later dental sac, formation of dentine l.s. 5. Ditto. formation of enamel l.s. 6. Formation of dentine and enamel, detail l.s. 7. Tooth shortly before dentition, detail l.s. 8. Gum with milk tooth and permanent tooth, l.s. 9. Gum with mature permanent tooth l.s. 10. Gum with root of tooth, t.s.

No. 725. Healing of Wounds and Regeneration. From the Wilhelm Roux Institute for Developmental Mechanics and Inheritance.

Compilation: Dr. Hanns Koch. 18 Projection Slides
 1. Earthworm. Regeneration of the 4 anterior segments, one week after the operation 2. Ditto. after 4 weeks 3. Ditto. after 5 weeks 4. Frog tadpole. Regeneration of the tail after incision, after 2 weeks 5. Ditto. 4 weeks after the operation 6. Salamander. Regeneration of the right foreleg, after 1 week 7. Ditto. after 2 weeks 8. Ditto. after 3 weeks 9. Salamander. Regeneration of foreleg, diagrams 10. Frog. Transplantation of a hindleg bud of a tadpole under the skin of the back of another tadpole. after 1 month 11. Salamander. Origin of the optic cup and lenses, diagrams 12. Ditto. Head l.s. 21 days after the cataract operation 13. Ditto. Left eye: retina deformed after 21 days 14. Ditto. Right eye: retina normal after 21 days 15. Ditto. Left eye, new lens, after 24 days 16. Ditto. Progressive formation of the new lens, after 30 days 17. Ditto. New lens free from the iris, after 35 days 18. Ditto. New lens in the right place, end of regeneration after 50 days

BOTANY - CRYPTOGAMS**No. 3510. Morphology of Thallophyta and Archegoniatae (Cryptogamae).**

148 Color Photomicrographs. *The complete series consists of 5 partial series which can be delivered individually also.*

No. 3511. Non-pathogenic Bacteria. 22 Color Photomicrographs

1. Streptococcus lactis, milk souring 2. Sarcina lutea, Gram stained 3. Gaffkya tetragena, occurring in tetrads 4. Bacillus subtilis, hay bacillus, bacilli and spores 5. Bacillus mycoides, large soil organisms 6. Bacillus mesentericus, smear Gram stained 7. Rhizobium radicicola, t.s. root nodules of lupin 8. Rhizobium radicicola, smear 9. Azotobacter, soil organisms 10. Bacterium prodigiosum (Serratia), chromogenic 11. Escherichia coli, colon bacillus 12. Aerobacter aerogenes, intestinal bacteria 13. Proteus vulgaris, putrefaction 14. Acetobacter aceti, manufacture of vinegar 15. Rhodospirillum rubrum, chromogenic rods 16. Spirillum volutans, flagella stained 17. Bacteria from mouth 18. Bacteria from human intestine 19. Bacteria from bread 20. Bacteria from yoghurt 21. Streptomyces griseus, branched organisms 22. Sphaerotilus natans, putrid water

No. 3513. Fungi and Lichenes 41 Color Photomicrographs

1. Stemonitis, slime mold 2. Synchronium endobioticum, potato black scab, t.s. 3. Plasmodiophora brassicae, clubroot, t.s. with young plasmodia 4. Ditto. t.s. with spores 5. Plasmopara viticola, downy mildew of grapes 6. Saprolegnia, water mold, sexual stages 7. Empusa muscae, l.s. of infected house fly 8. Peronospora parasitica, downy mildew of crucifers 9. Albugo candida, white rust of crucifers, t.s. 10. Mucor mucedo, black mold, sporangia 11. Rhizopus, bread mold, zygospores 12. Taphrina pruni, plum pockets, t.s. 13. Venturia pirinum (Fusicladium), pears-cab, t.s. 14. Pilobolus 15. Claviceps purpurea, ergot, l.s. stroma with perithecia 16. Ditto. t.s. of sclerotium 17. Peziza, t.s. apothecium 18. Podosphaera leucotricha, apple mildew, t.s. 19. Sclerotinia fructigena (Monilia), plum rot, t.s. 20. Morchella, morel, fruiting body, t.s. 21. Morchella, asci with ascospores, detail 22. Penicillium, blue mold 23. Aspergillus, brown mold 24. Tuber rufum, truffle, t.s. 25. Botrytis allii, grey mold of onions, t.s. 26. Rhytisma, tar-spot of maple, t.s. 27. Saccharomyces, yeast, formation of spores 28. Ustilago zeae, corn-smut, t.s. of pustule 29. Puccinia graminis, wheat rust, t.s. uredinia on wheat 30. Ditto. t.s. of telia on wheat 31. Ditto. l.s. of aecidia 32. Gymnosporangium sabinae, pear rust, t.s. teleutospores 33. Ditto. t.s. aecidia 34. Ditto. t.s. pycnidia 35. Psalliota, mushroom, l.s. pileus 36. Boletus edulis, mushroom. t.s. pileus 37. Coprinus, ink cap, t.s. of pileus 38. Coprinus, detail of basidia and spores 39. Scleroderma vulgare, puff-ball, t.s. 40. Physcia, lichen, t.s. thallus 41. Physcia, t.s. apothecium

No. 3518. Algae. 43 Color Photomicrographs

1. Oscillatoria, thin section 2. Nostoc 3. Anabaena 4. Scytonema 5. Rivularia 6. Chroococcus 7. Gloeocapsa small colonies 8. Diatoms, different forms 9. Pleurosigma angulatum, surface of shell 10. Pleurosigma angulatum, chromatophores 11. Surirella gemma, surface of shell 12. Spirogyra, vegetative 13. Spirogyra, in conjugation 14. Spirogyra, zygotes 15. Zygnema 16. Mougeotia 17. Cosmarium 18. Closterium 19. Micrasterias 20. Chlamydomonas 21. Haematococcus 22. Chlorella 23. Eudorina 24. Microcystis 25. Pleurococcus, growing on bark 26. Hydrodictyon, water net 27. Scenedesmus 28. Pediastrum 29. Volvox, with daughter colonies 30. Ulothrix 31. Cladophora 32. Draparnaldia 33. Enteromorpha, seaweed 34. Oedogonium, macrandrous with oogonia 35. Oedogonium, nannandrous with dwarf males 36. Chara, stonewort, antheridium and oogonium 37. Fucus vesiculosus, brown alga, conceptacle with antheridia, t.s. 38. Fucus vesiculosus, conceptacle with oogonia t.s. 39. Laminaria saccharina, kelp, t.s. of thallus 40. Batrachospermum, fresh water red alga 41. Polysiphonia, marine red alga, antheridia 42. Polysiphonia, cystocarps 43. Polysiphonia, tetraspores

No. 3523. Bryophyta. 18 Color Photomicrographs

1. Marchantia, liverwort, t.s. of thallus 2. Marchantia, rhizoids 3. Marchantia, l.s. of young archegonium 4. Marchantia, l.s. of mature archegonium 5. Marchantia, l.s. of antheridium 6. Marchantia, l.s. of sporophyte 7. Marchantia, l.s. of cupule with gemmae 8. Polytrichum, moss, t.s. of stem 9. Polytrichum, t.s. of leaf 10. Mnium, moss, archegonium, median l.s. 11. Mnium, antheridium, median l.s. 12. Mnium, sporophyte, t.s. 13. Mnium, sporophyte, l.s. 14. Mnium, protonema 15. Mnium, w.m. of leaf, surface view 16. Tortula, moss, w.m. of entire plant 17. Tortula, sporophyte with peristome teeth 18. Sphagnum, peat moss, surface view of leaf

No. 3527. Pteridophyta. 24 Color Photomicrographs

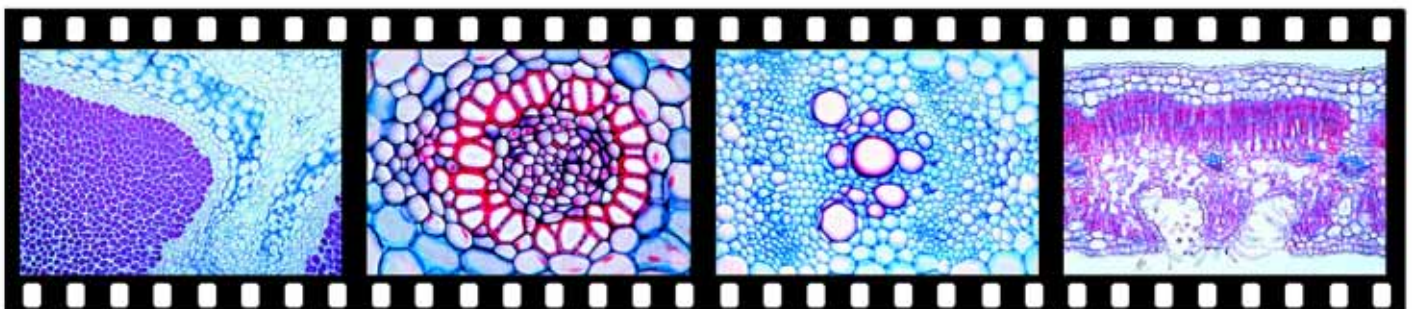
1. Psilotum, t.s. of three-lobed sporangium 2. Isoetes, quillwort, l.s. of entire plant 3. Lycopodium, club moss, t.s. of stem 4. Lycopodium, t.s. plectostele 5. Lycopodium, l.s. stem 6. Lycopodium, l.s. of mature strobilus 7. Selaginella, l.s. micro- and macrosporangia 8. Equisetum, horse tail, t.s. of stem 9. Equisetum, l.s. of stem apex 10. Equisetum, t.s. of strobilus 11. Equisetum, l.s. of strobilus 12. Equisetum, spores with elaters 13. Equisetum, growing spores 14. Aspidium, fern, t.s. of rhachis 15. Aspidium, t.s. of frond with sori 16. Pteridium, bracken fern, t.s. of rhizome 17. Pteridium, t.s. of root 18. Fern prothallium, young filamentous stage w.m. 19. Ditto. older stage w.m. general structure 20. Ditto. antheridia and archegonia, detail 21. Ditto. l.s. of antheridium 22. Ditto. l.s. of archegonium 23. Ditto. w.m. with young sporophyte 24. Phyllitis, hart's tongue, t.s. of leaflet

BOTANY - PHANEROGAMS**No. 3550. Microscopic Anatomy of Spermatophyta (Phanerogamae).**

173 Color Photomicrographs. *The complete series consists of 5 partial series which can be delivered individually also.*

No. 3551. Cytology and Tissues. 35 Color Photomicrographs

1. Typical plant cells w.m. of Allium epidermis 2. Nuclear membrane and nucleoli in megaspore mother cell 3. Cell division in l.s. root tip of Allium 4. Chromosomes during mitosis, squash preparation DNA stained 5. Prophase of reduction division 6. Metaphase reduction division, equatorial plate 7. Two mitotic figures with spindles





t.s. Liliun embryosac 8. Mitochondria in plant cells 9. Plasmolysis in plant cells 10. Cork cells 11. Pitted cell walls 12. Aleurone grains 13. Fat cells 14. Lysigenous oil glands 15. Starch grains, t.s. of Solanum tuber 16. Starch grains, isolated 17. Inulin crystals 18. Acid tannic 19. Calcium oxalate crystals 20. Crystal sand 21. Raphid cells with growing raphides 22. Lactiferous vessels, l.s. 23. Stone cells, t.s. fruit of pear 24. Stone cells, t.s. shell of walnut 25. Palisade sclereids 26. Sclerenchyma fibres, l.s. 27. Reserve cellulose 28. Chromoplasts 29. Chloroplasts 30. Annular vessels 31. Spiral vessels 32. Reticulate vessels 33. Scalariform vessels 34. Tracheid with bordered pits 35. Sieve tubes and sieve plates

No. 3554. Roots. 22 Color Photomicrographs

1. Root hairs and rhizodermis 2. Root tip and root cap of Lemna w.m. 3. Root tip and root cap l.s. 4. Starch granules in root tip of Zea mays 5. Zea mays, corn, typical monocot root, t.s. 6. Convallaria, t.s. of root 7. Ranunculus, buttercup, t.s. typical dicot root 8. Ranunculus, t.s. protoxylem 9. Quercus, oak, older woody root t.s. 10. Smilax, t.s. of root 11. Medicago, alfalfa, t.s. root 12. Beta, beet, t.s. of root 13. Taraxacum, t.s. of taproot 14. Lupinus, t.s. root nodules with bacteria 15. Alnus, alder, t.s. root nodules with actinomycetes 16. Neottia, orchid, t.s. root with endotrophic mycorrhiza 17. Monstera, philodendron, t.s. aerial root 18. Dendrobium, orchid, t.s. aerial root with velamen 19. Pinus, older woody root t.s. 20. Cuscuta, dodder, t.s. host tissue with haustoria 21. Cuscuta, haustoria detail 22. Salix, willow, l.s. origin of lateral roots

No. 3558. Stems. 34 Color Photomicrographs

1. Zea mays, corn, typical monocot stem t.s. 2. Zea mays, t.s. vascular bundle 3. Juncus, bulrush, t.s. stem 4. Triticum, wheat, t.s. stem 5. Convallaria, t.s. concentric vascular bundle 6. Convallaria, t.s. rhizome 7. Aristolochia, t.s. one-year stem 8. Aristolochia, t.s. older stem 9. Helianthus, sunflower, t.s. herbaceous stem 10. Ranunculus, buttercup, t.s. open vascular bundle 11. Cucurbita, t.s. stem 12. Cucurbita, t.s. vascular bundle, sieve plates 13. Cucurbita pepo, l.s. of stem, sieve vessels 14. Tilia, lime, t.s. cortex 15. Fagus, beech, rad. and tang.s. of wood 16. Fagus, t.s. of wood 17. Quercus, oak, rad. and tang.s. of wood 18. Quercus, t.s. of wood 19. Pinus, rad. and tang.s. of wood 20. Pinus, t.s. of wood 21. Sambucus, t.s. stem with lenticels 22. Pelargonium, t.s. young stem 23. Piper nigrum, pepper, t.s. dicot stem with scattered bundles 24. Arctium lappa, burdock, stem t.s. 25. Coleus, t.s. of square stem 26. Salvia, sage, t.s. of a square stem 27. Clematis, t.s. young hexagonal stem 28. Clematis, t.s. older stem 29. Nymphaea, water lily, t.s. of aquatic stem 30. Rosa, rose, l.s. of stem and spine 31. Stem apex of Elodea, l.s. 32. Stem apex of Hippuris, l.s. 33. Stem apex of Asparagus, l.s. 34. Pinus, pine, t.s. older woody stem

No. 3563. Leaves. 37 Color Photomicrographs

1. Leaf epidermis of Tulipa, surface view of stomata 2. Stomata, l.s. of Iris 3. Stomata, l.s. of Zea mays 4. Iris, t.s. of isobilateral leaf 5. Allium schoenoprasium, chive, t.s. folding leaf 6. Zea mays, corn, t.s. typical monocot leaf 7. Elodea, waterweed, t.s. of aquatic leaf 8. Galanthus, snowdrop, t.s. of leaf 9. Aesculus, chestnut, t.s. of leaf bud 10. Aesculus, chestnut, l.s. of leaf bud 11. Syringa, lilac, t.s. of typical dicot leaf 12. Fagus, beech, t.s. sun and shadow leaves 13. Nerium, oleander, leaf of xerophyte plant t.s. 14. Nerium, t.s. of sunken stomata 15. Solanum, potato, t.s. leaf, raised stomata 16. Ficus elastica, t.s. leaf, cystoliths 17. Buxus, box, t.s. xerophytic leaf 18. Rosa, rose, t.s. of leaf 19. Nymphaea, water lily, t.s. of floating leaf 20. Calluna, ling, revolute leaf t.s. 21. Drosera, sundew, leaf of insectivorous plant 22. Utricularia, bladderwort, w.m. of bladder 23. Dionaea, Venus flytrap, t.s. leaf, digestive glands 24. Pinguicula, butterwort, insectivorous plant, t.s. of leaf 25. Verbascum, mullein, branched leaf hairs 26. Elaeagnus, olive tree, stellate hairs 27. Humulus, hop, hooked hairs 28. Tillandsia, absorbent hairs 29. Urtica, nettle, stinging hairs 30. Aesculus, chestnut, t.s. petiole 31. Mimosa pudica, sensitive plant, l.s. of leaf joint 32. Juglans, leaf base with leaf scar l.s. 33. Ginkgo biloba, t.s. of leaf 34. Pinus, leaf t.s. 35. Pinus, vascular bundle of leaf t.s. 36. Abies, fir, leaf t.s. 37. Picea, spruce, leaf t.s.

No. 3567. Flowers and Fruits. 45 Color Photomicrographs

1. Liliun, t.s. of flower bud, floral diagram 2. Liliun, l.s. of flower bud 3. Liliun, anthers t.s. 4. Liliun, ovary, t.s. 5. Liliun, stigma with pollen tubes l.s. 6. Liliun, t.s. of trilobular stigma 7. Triticum, wheat, t.s. of seed 8. Triticum, l.s. of seed 9. Triticum, l.s. embryo 10. Solanum, potato, t.s. of flower 11. Pyrus malus, apple, hypogynous ovary, l.s. 12. Prunus avium, cherry, perigynous ovary, l.s. 13. Anthurium, flamingo plant, pedicel t.s. 14. Arum maculatum, l.s. of flower 15. Papaver, poppy, t.s. of flower 16. Corylus, hazel, female flower, l.s. 17. Corylus, male flower l.s. 18. Ranunculus, l.s. flower 19. Ranunculus, l.s. fruit 20. Capsella l.s. embryo 21. Taraxacum, l.s. composite flower 22. Taraxacum, t.s. composite flower 23. Viola, t.s. petal 24. Fritillaria, nectary l.s. 25. Epipactis, orchid, t.s. ovary 26. Monotropa, Indian pipe, t.s. ovary, developing embryosacs 27. Helianthus, sunflower, t.s. seed 28. Phaseolus, bean, t.s. pod 29. Ribes, currant, berry fruit t.s. 30. Rubus idaeus, raspberry, aggregate fruit, l.s. 31. Fragaria, strawberry, aggregate fruit, l.s. 32. Corylus, hazel, stone fruit t.s. 33. Prunus, plum, stone fruit t.s. 34. Pyrus malus, apple, young pome t.s. 35. Lycopersicum, tomato, t.s. berry fruit 36. Pinus, pine, l.s. male cone 37. Pinus, mature pollen 38. Pinus, l.s. young

female cone 39. Pinus, l.s. first year female cone 40. Pinus, ovule with archegonia, l.s. 41. Pinus, embryo and endosperm, l.s. cotyledons 42. Pinus, embryo and endosperm, t.s. cotyledons 43. Zamia, male cone t.s. 44. Zamia, young female cone l.s. 45. Zamia, young embryo t.s.

No. 3645. Vascular Bundle types. 16 Color Photomicrographs

1. Psilotum, stem t.s. protostele 2. Lycopodium, stem t.s. actinostele 3. Pteridium, rhizome t.s. polystele 4. Osmunda, rhizome t.s. ectophloic siphonostele 5. Adiantum, rhizome t.s. amphiphloic siphonostele 6. Polypodium, rhizome t.s. dictyostele 7. Ranunculus, stem t.s. eustele 8. Lamium, stem t.s. eustele 9. Zea mays, stem t.s. atactostele 10. Podophyllum, t.s. stem, bundles similar to atactostele 11. Ranunculus, t.s. stem, open collateral bundle 12. Zea mays, corn, t.s. stem, closed collateral bundle 13. Cucurbita, t.s. stem, bicollateral bundle 14. Pteridium, t.s. rhizome, concentric bundle, inner xylem 15. Convallaria, t.s. rhizome, concentric bundle, outer xylem 16. Ranunculus, t.s. root, radial concentric bundle

No. 3630. Development of the Megaspore Mother Cells of Liliun (Embryosac). 23 Color Photomicrographs

1. Ovary of lily, t.s. general study 2. Very young ovary 3. Developing embryosac mother cell 4. Megaspore mother cell, pachytene 5. Anaphase of first division 6. Telophase of first division 7. Two-nucleate embryosac 8. Anaphase of second division 9. Telophase of second division 10. First four-nucleate stage 11. Ditto., migration of nuclei 12. Prophase of the third division 13. Metaphase of third division 14. Telophase of third division 15. Second four-nucleate stage 16. Metaphase of fourth division 17. Anaphase of fourth division 18. Eight-nucleate stage, the mature embryosac 19. Double fertilization 20. Formation of embryo, early stage 21. Formation of embryo, later stage 22. Young embryo, suspensor cells, l.s. 23. Older embryo, l.s. cotyledons

No. 3635. Development of the Female Gametophyte of Pinus.

15 Color Photomicrographs

1. Young female cone, l.s. general view 2. Bract scale, ovuliferous scale and ovule 3. Young ovule before pollination 4. Growing ovule at free nuclear stage 5. Growing ovule, later stage with macroprothallium 6. Mature archegonium 7. Fertilization of archegonium 8. First division of fertilized egg nucleus 9. Four-nucleate stage, nuclei in centre of archegonium 10. Four-nucleate stage, nuclei migrate to the base 11. Sixteen-nucleate stage, nuclei lie in four tiers 12. Young proembryo, short suspensor cells 13. Older proembryo, elongated suspensor cells, four young embryos 14. Embryo with endosperm, l.s. of cotyledons 15. Ditto. t.s. showing eight cotyledons

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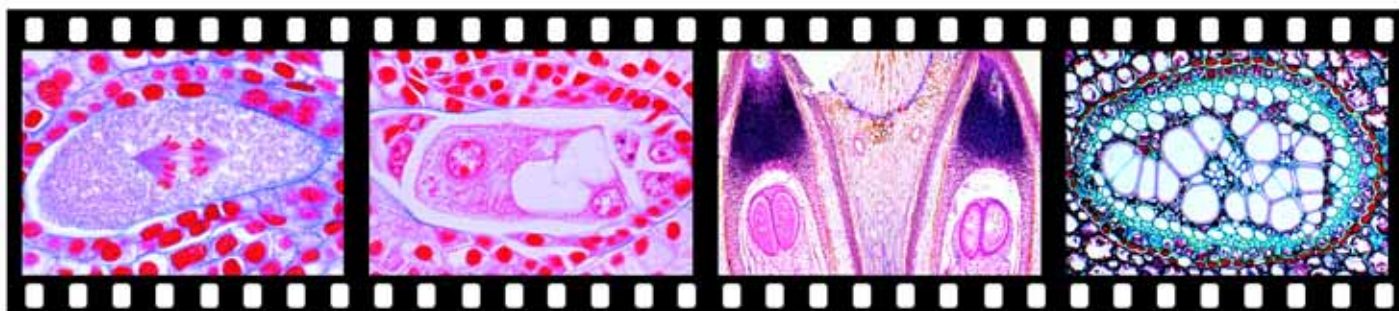
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No. 654. Classes of Matter, Properties, Chemical Bonding. 15 Projection Slides. Proceeding from the fundamentals of chemistry, inherent laws and correlations between the physical and chemical properties of the stuffs and the ideas of the atomic composition and chemical bonding are illustrated.

1. The classes of the matter. Chemical nomenclature 2. The aggregate states 3. The general properties of the matter 4. The characteristic properties of the three types of elements 5. Atomic bond 6. Ionic bond 7. Metal bond 8. Polarization, bond types 9. Co-ordinative bond 10. VAN DER WAALS forces 11. Hydrogen bonding 12. Ionic dissociation of salts, acids and bases 13. The electrolytic process and its educts 14. Typical substance with various bond-types 15. Polymerization and macromolecules

No. 656. Symmetry of Crystals, Properties of Minerals, Research into the Structure. 40 Projection Slides. Correlations between arrangement of the particle grating and the macro-symmetry of the crystallized matter are shown. Some macro-physical properties of solids being suitable as criterions for the determination of minerals. The principles of X-ray analysis of the structure.

1. The macro-symmetry 2. Electron micrograph of metal surface 3. Electron micrograph of virus protein crystal 4. The crystallographic symmetry elements 5. The crystal symmetries elements 6. The crystal grating model 7. The crystal forms 8. Transition stages of crystallization 9. The three-dimensional orientation of lattice planes 10. The stereographic projection 11. Perfect crystal and real structure with distortions 12. Example for crystal twinning 13. Forms of crystal growth and crystal aggregates 14. Isotopy and macro-symmetry 15. Characteristics of the crystalline state 16. Color, transparency and opacity 17. Mohs scale of hardness 18. Typical anisotropic effects 19. Forms of cleavability 20. The double refraction 21. Dichroism and pleochroism 22. Double refraction and polarization of light waves 23. Orthoscopic interference figure of zinc selenite 24. Conoscopic interference figure of an uniaxial crystal 25. Ditto. of a biaxial crystal 26. Structure analysis of light diffracting matter 27. X-ray diffraction after Max von der Laue 28. Historic experimental set-up after Max von der Laue 29. Laue pattern of a triclinic mineral 30. Ditto. monoclinic mineral 31. Ditto. rhomboid mineral 32. Ditto. trigonal mineral 33. Ditto. hexagonal mineral 34. Ditto. tetragonal mineral 35. Ditto. cubic mineral 36. Radiographical method Debye-Scherrer 37. Comparison of powder photographs 38. Single crystal photograph, Buerger precession technique 39. Vector analysis of a Patterson function 40. Electron density by Fourier analysis

No. 660. Morphology of the Most Important Minerals, Part I. Elements and Bonds. 82 Projection Slides. The series show the most important and well-known minerals in that state, which is for a collector the most common to find in the nature. The specimens show all the typical characteristics and enable therefore a sure identification of finds. From that minerals, which are often subject to variations of their appearance, two or more specimens are shown on one picture.

1. *Elements* 1. Graphite 2. Diamond in kimberlite 3. Sulphur 4. Native arsenic 5. Native copper 6. Native silver 7. Native gold 8. Native bismuth 2. *Sulphides and arsenides (ores)* 9. Pyrite (fools gold) 10. Marcasite (white iron pyrite) 11. Bornite (purple copper ore) 12. Chalcopyrite (copper pyrite) 13. Covellite 14. Chalcocite 15. Galenite (lead glance) 16. Sphalerite (false galena) 17. Wurtzite 18. Cinnabar 19. Pyrrhotite (magnetic pyrite) 20. Stibnite (antimonite) 21. Niccolite (copper nickel) 22. Smaltite (scutterudite) 23. Molybdenite 24. Realgar 25. Orpiment (yellow arsenic) 26. Arsenopyrite (mispickel) 27. Proustite (light red silver ore) 3. *Halides (salts)* 28. Halite (rock-salt) 29. Sylvite (sylvine) 30. Fluorite crystal (Derbyshire spar) 31. Carnallite 32. Cryolite (Greenland spar) 4. *Oxides and hydroxides* 33. Magnetite (magnetic iron-ore) 34. Haematite (red iron-ore) 35. Corundum, emery and ruby 36. Rock-crystal (quartz crystal) 37. Chalcedony and agate 38. Common and precious opal 39. Rutile 40. Cassiterite (tinestone) 41. Pitchblende (nasturan) 42. Chromite (chromium iron ore) 43. Ilmenite (titaniferous iron ore) 44. Pyrolusite (manganese ore) 45. Perovskite 46. Spinel 47. Zincite (red oxide of zinc, spartalite) 48. Psilomelane 49. Goethite 50. Brucite 51. Bauxite 52. Limonite (brown haematite) 5. *Carbonates* 53. Calcite crystal (calcspar) 54. Dolomite rock (dolostone) 55. Siderite (iron spar) 56. Aragonite 57. Cerussite (white lead ore) 58. Malachite (green carbonate of copper) 59. Azurite (blue copper ore) 60. Smithsonite (dry bone ore, calamine) 61. Witherite 62. Magnesite 63. Rhodochrosite 6. *Borates* 64. Tincal (borax) 65. Ulexite (cotton ball) 7. *Sulphates, chromates, molybdates and wolframates* 66. Gypsum 67. Anhydrite (cube spar) 68. Barite 69. Celestine 70. Crocoite (red lead ore) 71. Wulfenite (yellow lead ore) 72. Wolframite 73. Scheelite 8. *Phosphates, arsenates, vanadates* 74. Apatite 75. Pyromorphite 76. Callaita 77. Monazite 78. Erythrite

(cobalt bloom) 79. Annabergite (nickel bloom) 80. Wavellite 81. Desclozide, vanadium ore 82. Vanadinite

No. 669. Morphology of the Most Important Minerals, Part II. Silicates.

56 Projection Slides. This series presents beautiful color photographs of the most important minerals out of the large group of the silicates.

1. Olivine in basalt 2. Garnet in mica-schist 3. Topaz crystal 4. Zircon crystal 5. Andalusite 6. Disthene (cyanite) 7. Titanite (sphene) 8. Staurolite 9. Hemimorphite (natural zinc silicate) 10. Epidote 11. Zoisite 12. Beryl, Blue variety 'aquamarine' 13. Cordierite (iolite) 14. Tourmaline 15. Dioptase 16. Chrysocolia 17. Diposide 18. Common and basalt augites 19. Spodumene (triphane) 20. Jadeite 21. Enstatite 22. Bronzite 23. Hypersthene 24. Tremolite 25. Actinolite 26. Common hornblende 27. Basalt hornblende 28. Wollastonite (tubularspar) 29. Rhodonite 30. Talcum 31. Prehnite 32. Muscovite (Muscovy glass) 33. Phlogopite 34. Biotite 35. Lepidolite 36. Fuchsite 37. Chrysotile 38. Antigorite 39. Nepheline (nephelite) 40. Leucite (Vesuvian garnet) 41. Analcime (analcite) 42. Orthoclase and aaventurine feldspar (sunstone) 43. Microcline 44. Amazonite (amazonstone) 45. Albite (pericline) 46. Labradorite 47. Anorthite 48. Sodalite 49. Hauyne, in porous lave 50. Lazurite (ultramarine), gem lapis lazuli 51. Natrolite 52. Harmotome 53. Stilbite (desmine) 54. Apophyllite (fish-eye stone) 55. Tektite, glassy silicate 56. Moldavite (water-chrysolithe), from meteoric striking

No. 675. Morphology and Microstructure of the Most Important Sorts of Rocks.

39 Projection Slides. The macrophotographs give a picture of habit and structure of the surface of the most important rocks. Microphotographs of thin sections of the same sorts in polarized light demonstrate their inner structure in colorful pictures.

1. Survey and nomenclature of rock types 2. Chemistry of eruptive rocks 3. Volcanics: Lave, pumice and obsidian 4. Intrusive rock granite 5. Thin section of granite 6. Intrusive rock granodiorite 7. Intrusive rock syenite 8. Thin section of syenite 9. Intrusive rock diorite 10. Thin section of diorite 11. Intrusive rock gabbro 12. Thin section of gabbro 13. Matrix rock granite porphyry 14. Thin section of granite porphyry 15. Matrix rock diabas 16. Thin section of diabas 17. Matrix rock pegmatite 18. Extrusive rock basalt 19. Thin section of basalt 20. Extrusive rock rhyolite 21. Extrusive rock trachyte 22. Extrusive rock andesite 23. Clastic sedimentary rock sandstone 24. Thin section of sandstone 25. Clastic sedimentary rock greywacke 26. Clastic sedimentary conglomerate 27. Clastic sedimentary breccia 28. Chemical sedimentary rock travertine 29. Thin section of travertine 30. Biogenous deposit anthracite coal 31. Biogenous deposit diatomaceous earth 32. Pelitic metamorphic rock mica-schist 33. Thin section of mica-schist 34. Sialic metamorphic rock gneiss 35. Thin section of gneiss 36. Carbonatic metamorphic rock marble 37. Thin section of marble 38. Regional metamorphic rock serpentine 39. Thin section of serpentine

No. 679. Gems and Precious Stones. 17 Projection Slides. This series also fascinates by the beauty and the great variety of details in its color photographs. There are shown well-known and economically interesting gems and precious stones.

1. Forms and cuts of precious stones 2. Classification of gems and precious stones 3. Corundum group: ruby and sapphire 4. Beryl group: aquamarine and emerald 5. Spinel group: pleonaste and magnesian spinel 6. Topaz varieties 7. Garnet group: pyrope, grossular and almadine 8. Tourmaline varieties 9. Spodumene group: hiddenite and kunzite 10. Quartz group I: rock crystal, amethyst, cairngorm, citrine, rose quartz 11. Quartz group II: aventurin, hawk's eye, tiger's eye 12. Chalcedony varieties: carnelian, jasper, chrysoprase, bloodstone 13. Banded chalcedony varieties: agate and onyx 14. Opal varieties 15. Jade varieties: jadeite and nephrite 16. Feldspar group: sunstone, moonstone, amazonstone 17. Callaita and turquoise matrix

No. 3690. Rocks and Minerals. This series shows 15 important and typical rocks and minerals ground thin. In the polarised light, the components of the specimens appear in various colors. 15 Color Photomicrographs

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PHYSICS AND CHEMISTRY ELECTRICITY AND MAGNETISM

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