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NEWS LETTER

BUREAU OF PLANT QUARANTINE

UNITED STATES DEPARTMENT OF AGRICULTURE

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FOREIGN PLANT QUARANTINES

RECENT ENTOMOLOGICAL INTERCEPTIONS OF INTEREST

Olive fruit fly from Greece.--One larva and five pupae of Dacus oleae Rossi were intercepted at Baltimore in olives in baggage from Greece.

Turnips infested.--Living larvae of Psylliodes chrysocephala L. (Chrysomelidae) were intercepted at New York in turnips in stores from the Canal Zone.

Leaf beetle in Puerto Rico.--Living adults of Cryptocephalus tristiculus Weise (Chrysomelidae) were collected on orange leaves in the field at Adjuntas, P.R.

Termite in lath stripping.--Living Kalotermes hubbardi Banks were intercepted at Nogales, Ariz., in the lath stripping of a carload of mixed vegetables from Mexico. This termite occurs in Arizona and California.

A cylindrical bark beetle from New Zealand.--An adult of Anommatus duodecimstriatus Mull. (Colydiidae) was intercepted at San Francisco on a Dierama sp. corm in the mail from New Zealand. This beetle is recorded from Middle Europe, Madeira, and St. Helena. It is found in vegetable refuse, such as old seed potatoes, and in rice or flour which has stood for a long time.

Beetles from Mexico.--Living adults of Disonycha antennata Jac. and D. dorsata Harold (Chrysomelidae) were taken at New Orleans on bananas in cargo from Mexico.

Weevil from Austria.--Adults of Anthonomus rectirostris L. (Curculionidae) were intercepted at Philadelphia in seeds of Prunus padus in cargo from Austria.

Diamond-back moth from Cuba.--A living larva of Plutella maculipennis Curt. (Plutellidae) was intercepted at Baltimore on a cabbage leaf in stores from Cuba. This is a cosmopolitan insect which was introduced into the United States. Besides

cabbage it attacks cauliflower and turnip.

Insects in packing material.--Living specimens of Ochetostethus nanus H. S. (Cydnidæ) and Peritelus suturellus Fairm. (Curculionidæ) were taken at New York in packing material (straw and sphagnum) around grape cuttings in cargo from Italy.

Homopteron in Puerto Rico.--Living specimens of Sogata furcifera How. (Delphacidæ) were collected on leaves of Lantana sp. in the field at Loiza, P.R.

A leaf beetle from Mexico.--A living adult of Diabrotica corrusca Jac. (Chrysomelidæ) was intercepted at Nogales, Ariz., on a string bean pod in cargo from Mexico.

Hemipteron from Ecuador.--Lethocerus camposi Montandon (Belostomatidæ) was taken at Seattle, Wash., with bananas in cargo from Ecuador.

Scale insect from Japan.--Lepidosaphes pallida (Green) (Coccidæ) was intercepted at San Francisco on a plant of Sciadopitys verticillata in ship's quarters from Japan.

Weevils from Pretoria.--Antliarhinus zamiae Thunberg and A. signatus Gyll. (Curculionidæ) were intercepted at Washington, D.C., in seeds of Encephalartos sp. in the mail from Pretoria, South Africa, via Jacksonville, Fla. The proboscis of the female of A. zamiae is two and one half times as long as the body. These weevils are not recorded from the continental United States.

RECENT PATHOLOGICAL INTERCEPTIONS OF INTEREST

First interception of Phaeomarsonia.--Phaeomarsonia sp. was intercepted at Seattle on March 7 on Cymbidium virens sinensis from Japan, our first interception of any of the plant parasites belonging to this genus.

Ficus disease.--Our first interception of the genus Linochora was made at Philadelphia on Ficus sp. from Guatemala. Miss E. K. Cash was unable to determine the species as the spores are too long for any of the species listed for that host.

Banana fungus.--Diseased banana leaves intercepted at Philadelphia on March 12, in cargo from Guatemala, were examined by Miss Cash who reports, "Hypomyces (terrestris ?). Dimensions of asci and spores agree with this species although it is more effuse." This is our first interception of this species.

Pear disease.--A diseased pear twig from Poland was intercepted in the mails at New York on March 20, and has been determined as Melanconium (stromaticum Cda. ?). This fungus is reported as affecting pear in Europe but no specimen or adequate description is available. This is our first interception of this genus on pear.

Physalis husk disease.--Diseased spots on the husk of a husk tomato from Mexico intercepted at El Paso were found to be due to Phyllosticta sp., our first interception of this fungus on this host.

Nectria on turnip.--Diseased turnips from Germany intercepted at Gulfport on March 22 were found to bear immature fruiting bodies of Nectria sp. as well as Fusarium sp. its conidial stage. This is our first interception of a Nectria on turnip.

Phoma on magnolia.--A bit of diseased tissue from a Magnolia stellata from Japan was found to bear a single sporulating pycnidium of Phoma sp., our first interception of this genus on this host. The plant was offered for entry under special permit at Seattle.

Septoria on Primula.--A leaf spot on Primula vulgaris from England was intercepted at Philadelphia and found to be caused by Septoria sp., our first interception of this genus on this host.

Phytophthora sp. on carrot.--Our first interception of a Phytophthora on carrot was made at Mobile in carrots from Germany.

Sugarcane disease.--Basisporium gallarum was intercepted from Mexico for the first time on March 8, in sugarcane at Nogales.

Apple disease.--An apple from Switzerland intercepted at Philadelphia on February 8 had a peculiar spotting that did not appear to be any of the forms of apple scab developed in storage but fit Miss Jenkins' description of Elsinoe on apple fairly well. The apple was submitted to Miss Jenkins who reports that if not scab it is Elsinoe piri, the material being inadequate for a definite determination.

Uncommon interceptions.--Among the diseases intercepted but one or a few times in previous years were Septoria evonymi on Euonymus sp. from Japan at Seattle on March 6, only previous interception from France; Phyllosticta sp. on Camellia from Japan at Boston on February 21, and at Seattle on April 12; and Phoma sp. on tree peony from Japan at Seattle, only previous interceptions at San Francisco, 1920-21.

ARTICLE ON INTERCEPTED ONION DISEASE

Attention is called to "Onion-bulb decay caused by Aspergillus alliaceus" by J. C. Walker and Albert Murphy in Phytopathology 24: 289-291. March, 1934. This fungus seems to be known from two interceptions on Italian garlic only, but laboratory experiments indicate that it is a potentially serious onion disease.

LOCAL COLLECTIONS

Among the interesting local collections for which determinations became available during the month were the following: Pestalozzia macrotricha and Monochaetia sp. (differing from M. rhododendri in shorter seta and larger spots) on rhododendron collected by Seattle inspectors; Gloeosporium manihotis on manihot from Dominican Republic and Isariopsis griseola on bush bean leaf collected in Puerto Rico; and Sphaceloma sp., violet scab, on violets near Mobile, the first authentic report of the disease from Alabama.

RICE STRAW BOTTLE JACKETS FROM SPAIN

Thirty cases containing wines from Williams & Humbert, Jerez, Spain, recently arrived at the port of Chicago consigned to a local dealer. An examination disclosed the presence of rice straw jackets used as a protective covering for the bottles. While no specimens of Chilo simplex were discovered, there was sufficient evidence of this or some other insect having emerged from many of the culms. A number of living specimens of Attagenus piceus were intercepted.

When the importer was informed that the use of rice straw as packing material was prohibited he immediately notified the exporter to discontinue its use. He further expressed his appreciation of being notified regarding this initial shipment, so as to avoid a similar situation in connection with larger shipments which are expected to follow.

FRUIT WANDERS FAR

It is a far cry from the balmy climate of Hawaii to the wind-swept plains of North Dakota, and one would hardly expect a traveler from Canada at that point to bring tropical fruits with him to this country. Yet the customs officer at Portal, N. Dak., intercepted there on April 27, 8 mangoes and 2 pears, which inquiry disclosed had come from Hawaii. The fruit was abandoned for destruction by the owner. This incident illustrates the effective cooperation which is being given by the customs officers along the Canadian border in the enforcement of plant quarantines, a cooperation which is being greatly helped by the personal port-to-port visits of our three representatives who have been making this border situation a special problem.

TRAVELING TERMITES

In the entomological notes above there is recorded the finding of living termites in the lath stripping in a vegetable car entering from Mexico at Nogales, Ariz. This month's records bring to light another lot of termite travelers, this time found in an oak branch carried in a truck coming from Mexico through Douglas, Ariz. These represented a species of Coptotermes, possibly C. crassus Sny. The termites are notorious because of their wood-destroying proclivities and their habit of carrying on their depredations wholly out of sight. There are numerous species in the tropics which might prove destructive here if allowed to establish themselves, and therefore common prudence would suggest that infested material be not allowed to enter the country.

ORCHID SMUGGLERS FINED

From the general experience of plant quarantine inspectors it is gathered that only a very few cases where travelers are found in possession of prohibited or restricted plants represent deliberate attempts to smuggle these materials into this country, all but 1 percent of the cases or less being evidently attributable to ignorance of quarantine restrictions. While the great mass of the traveling public is thus found to be essentially law-abiding, an occasional case comes to light where the effort to get plants by the inspector is deliberate and determined.

Such an effort was made recently in New Orleans by a passenger and his wife arriving there April 18 on the S.S. Delvalle from South America.

From chance information coming indirectly from a member of the crew, the plant quarantine inspector learned that these passengers had plants in their possession, and the inspector then requested the customs officials to ask particularly if they had declared everything. They had. The plant quarantine inspector then himself questioned them as to plants, and was assured that they had none. Examination of the baggage, which it is needless to say was thorough, disclosed eight orchid plants in a package which the woman sought to keep from being opened by declaring it contained kotex, and four others stuffed in a golf bag which she again vowed contained only clubs and shoes. Because of the flagrant nature of the incident a case was made against these passengers by the plant quarantine inspector through customs, as a result of which a fine of \$22.50 was assessed, representing an appraised value of \$1.50 per plant, plus 25 percent duty. In addition the orchids were confiscated and turned over to the plant quarantine inspector who disposed of them by the usual means--the incinerator.

NEW BAGWORM IN BANANA DEBRIS

A rather typical example of how the eye of the plant quarantine inspection system functions in picking up foreign pest intruders is furnished by the finding of a new species of bagworm in banana debris.

Since the spring of 1933 interceptions of these bagworms have been made at and specimens sent in for identification from Boston, Philadelphia, Charleston, Mobile, and New Orleans. The insect has been found fairly constantly since then, and in apparently considerable numbers, in the refuse accompanying banana shipments from Panama, Guatemala, Honduras, Mexico, and Colombia. Because of difficulty in securing adult males which are needed for certain identification there has been some delay in classifying the insect, but a representative of the Bureau of Entomology advises: "* * * Apparently it is an undescribed species and we can do nothing more with it until normal moths in good condition are reared. To this end I have written Dr. Wilson Popenoe and asked him to find someone connected with the Fruit Company who can undertake the rearing in Honduras or to suggest someone else in the Tropics to whom we can apply. I hope my letter brings results, as this Psychid obviously is a specific banana insect and may be of some economic importance."

Aside from the possibility that the insect may rank as an undesirable pest, it is interesting to note that it has only come into the field of entomological knowledge through the concurrent activities of inspectors at five of our ports. The incident also provides illuminating explanation of why there is such insistence on the freedom of fruit and vegetable imports from trash and debris.

FOREIGN PLANT QUARANTINE ACTIVITIES INCREASE AT BOSTON

(Excerpt from letter from W. G. Bemis, Inspector in charge)

"We fumigated more material during the month than we have fumigated since May of 1930. The number of importations, requiring inspection or fumigation, was

also larger than at any time during the same period. The Post Office inspection, aside from the shamrocks which we inspected, was larger than most of our previous months.

"You may be interested in an item in this morning's Boston Post which states that in the nine (9) months ending March 31st the duty collected in this district totalled \$22,170,944 against \$13,776,210 for the same period of last year. The goods brought in for immediate consumption last week amounted to \$2,520,252 against \$584,522 last year.

"This clearly indicates the increase of business at this port and the general trend of business here is better than it has been for some time."

DOMESTIC PLANT QUARANTINES

TRANSIT INSPECTION

The unusually delayed spring in the Eastern States this year caused a rush of nursery shipping when the season finally opened late in April and the stock continued to move in heavy volume during the early part of May. The fact that there were so many more shipments than a year ago naturally resulted in more quarantine violations being intercepted, possibly due to the needed additional labor in the shipping departments of the nurseries and to the fact that concerns which had not shipped outside the regulated areas for several years again received orders enabling them to do so this season. At New York City the greatest number of interceptions for one day was on May 1, when 19 violations of the gypsy moth and Japanese beetle quarantines were intercepted. Heretofore when considerable numbers of interceptions have occurred on one day it has usually been due to a single firm overlooking the quarantine regulations and making a large number of shipments at one time without complying with the requirements. In this instance, however, the interceptions originated with a considerable number of different shippers.

The white pine blister rust quarantine requires that currant and gooseberry plants shipped from the infected States, unless they are completely dormant, must be dipped immediately prior to shipment in lime-sulphur solution of prescribed strength and that the presence of this dip must be plainly visible on the plants and easily detectable by odor. Transit inspectors, however, in order to be sure that sprouting plants which appear not to have been dipped actually do not show any signs of sulphur, use a chemical test which has been devised by the Bureau of Chemistry and Soils. The principle of this test is the application to the Ribes of a few drops of a solvent. When this has had a few moments to dissolve the sulphur, a filter paper previously soaked in lead acetate and dried, is applied. If sulphur is present it shows on the filter paper as a brown stain. It is difficult for the nurserymen to keep Ribes dormant in storage as late as this and

consequently many of them are using the sulphur dip for their late season shipments.

"ECB" appearing on certificates issued by the Bureau has been the subject of recent inquiry on the part of State inspectors and others. This is an abbreviation for European corn borer, and when entered on a joint certificate, i.e., one showing certification under two or more quarantines, it shows that the contents have been inspected and found free from the borer, as required under quarantines of a number of States. For instance, "45, 48, ECB" appearing on the tag shows that the contents of the package have been inspected and found free from the gypsy moth (Quarantine No. 45), the Japanese beetle (Quarantine No. 48), and the European corn borer. The addition of "63" indicates that pines are authorized to be moved under the blister rust quarantine, and "63 Cont. Ar." that a control-area permit has been issued. When only quarantines 45 and 48 are the subject of certification, the inspector draws a line through the blank space following these numbers on the tag, to show that no other authorization is involved. The joint-certification plan is used in order to avoid requiring shippers to use two or more stamps or certificates on the bundle.

The inspection in transit of granite shipments to determine whether they have been certified under the gypsy moth quarantine has been somewhat complicated through the practice of attaching the certificates to the waybills but not to the shipment. While the regulations provide for this practice in the case of carload or bulk shipments, the transit inspectors have at times found that the waybills are not available for checking at the time the shipment is seen, and they have been obliged to put the railway employees to considerable inconvenience in securing the waybills for examination. Accordingly, the gypsy moth inspectors have made arrangements for attaching the certificates to the crates, so that hereafter each piece of granite as well as the waybill will bear evidence of certification.

Granite and marble were the contents of about 60 percent of the shipments which the inspector checked for compliance with the gypsy moth and Japanese beetle quarantines at Cedar Hill freight transfer, New Haven, Conn., during the 7-week period of inspection ending April 9, according to a list of the shipments recently sent in to the Washington office. Plants, bulbs, and nursery stock, with occasional consignments of gravel, poultry grit, wooden reels, and lumber, made up the remainder of the shipments.

The completion of the new parcel-post building on a branch of the New York Central Railroad at 30th St. and Ninth Ave., in New York, has necessitated a change of schedules in the work of inspectors in that city. Most of three floors in this 10-story building are devoted to the handling of parcel post, the City Post Office and the Railway Mail Service dividing the space. Practically all parcel post moving to, from, or through the city is handled either in this building or in the one adjoining the Pennsylvania Railroad Station about two blocks away.

Transit inspection was discontinued on May 15 at Spokane and Seattle, on May 7 at Omaha and Council Bluffs, and on May 24 at Kansas City. At New Haven and Pittsburgh the checking of shipments by Japanese beetle inspectors was discontinued in April, as was that at Milwaukee by a State inspector.

The hearty cooperation the postal authorities at Chicago are showing in the quarantine enforcement work was stressed by Mr. Corliss in a talk on transit inspection at a meeting of the Post Office Supervisors' Association held in that city on May 7. "If it were not for the assistance of the supervisors and clerks in holding out plant shipments for inspection, and making such arrangements in the post office buildings as will provide convenient space for inspection," he said, "our work would necessarily be much more expensive and less efficient." Mr. Corliss' talk was supplemented with posters, maps, and bulletins showing the life history of the major pests which are the subject of Federal quarantines.

WHITE-PINE BLISTER RUST

The environs of pine-growing nurseries in West Virginia, Ohio, New York, Connecticut, Massachusetts, New Hampshire, Vermont, and Maine were inspected during the period from April 15 to May 15 to insure that the zones are maintained free from *Ribes* as required in the pine-shipping permits.

BLACK-STEM RUST OF GRAINS

Evidence has developed that *Berberis buxifolia pygmaea* may possibly prove to be susceptible to the attack of the grain rust. Accordingly, PQCA 320 has been revised a second time to place this species in Class D of the various groups classified according to degree of susceptibility. This has the effect of prohibiting the movement of this species into any of the 13 protected States pending final determination of its reaction to the rust.

JAPANESE BEETLE, MOTHS, AND EUROPEAN CORN BORER

Combined Project Notes

Shifts in personnel have changed the district supervisors in charge of the Virginia-District of Columbia and northern New England areas. Effective April 11, H. B. Ward was transferred from field work to Richmond, Va., where he assumed supervision of Japanese beetle quarantine enforcement work in Virginia and the District of Columbia. H. N. Bartley, formerly district supervisor at Richmond, was transferred on April 16 to take charge of the work under the jurisdiction of the Boston, Mass., headquarters. In addition to supervising the Japanese beetle work in Maine, New Hampshire, Vermont, Massachusetts, and Rhode Island, Mr. Bartley will have immediate jurisdiction over all gypsy moth and brown-tail moth quarantine enforcement throughout the territory restricted under quarantine 45. R. S. Clifton will remain as administrative assistant in the Boston office. F. W. Graves will assist Mr. Bartley in supervising the field work. Coordination of the nursery inspection work peculiar to both quarantines 45 and 48 will proceed under Mr. Bartley's direction.

Erle G. Brewer, senior administrative officer, resigned effective at the

close of April 6. Mr. Brewer plans to enter a private business enterprise. Since his original appointment in the Bureau of Entomology in 1919, Mr. Brewer has had successive experience in corn borer quarantine enforcement and Japanese beetle trapping activities. Prior to the merging of the Japanese beetle and corn borer projects, he had charge of the western division of the corn borer quarantine enforcement activities with headquarters in Springfield, Ohio. In June 1932 he transferred to the combined headquarters at South Norwalk, Conn. Since inauguration of the Federal European corn borer certification service to conform to certain State quarantine orders, Mr. Brewer has directed the inspectors assigned to this work. In addition he supervised Japanese beetle trapping activities to determine the extent of infestation in nonregulated territory.

Japanese Beetle Activities

"What a bug!" is the final characterization of the Japanese beetle by Professor M. A. Blake, chief of horticulture at the New Jersey Agricultural Experiment Station, in concluding an article outlining the pest's feeding habits in the March issue of the New Jersey State Horticultural News. In upholding his contention that the Japanese beetle is "the most modern and up-to-date bug known to horticulture" Professor Blake lists the following accomplishments of the insect: "It is such a keen judge of the growth status of apple and peach trees that it can distinguish trees that are high in carbohydrates from those high in nitrogen. It is so clever in this regard that it can even pick out the leaves upon an individual apple tree that are relatively high in carbohydrates as compared to the others upon the same tree that are low in carbohydrates. It can distinguish without fail between *Prunus domestica*, the European plum, and *Prunus triflora*, the Japanese species. In the collection of more than 300 named varieties of peaches at the New Jersey Experiment Station, the Jap beetle can identify those which rate 8-10 in edible quality as compared to those which do not rate above 7. Last, but not least, this modern bug is an expert in determining the amount of residue of lead arsenate which man applies to the foliage of fruit trees." Finally, the author states, "And who will say after the season of 1933 that the beetle is unable to distinguish between calcium arsenate and lead arsenate? What a bug!" Professor Blake's contribution provoked the following verse in the New York City American for April 4:

"The Japanese beetle is a very fine bug,
His learning is astounding, he's a very clever mug;
He knows his carbohydrates; he's wised up on the plums,
And he eschews lead arsenate whenever Springtime comes."

"We have lost more stock this year from 'winter-killing' than in the past 40 years combined" is the report of one large nurseryman in the Philadelphia district. Instances of pronounced winter-killing of hardy plants may be observed throughout the entire northern regulated territory. Particularly is this true of hedges of California privet and ornamental boxwood. English ivy suffered severely from the winter's low temperatures. Many valuable old hedges succumbed or have been winter-killed to such an extent that cutting to the ground is necessary so that new hedge may be grown from the root sprouts. On the Capitol plaza in Harrisburg approximately 400 feet of ornamental boxwood hedge was completely winter-killed. This dead hedge will be removed and the ground seeded to grass.

Specimen plants of boxwood when unprotected and in exposed locations were often scorched and will require pruning off of the dead leaf tips. Roses rather generally lost most of their wood above the snow line. Some hybrid lilacs show injury to the flower clusters. Rhododendrons and other broad-leaved evergreens lost most of their blooms and some wood injury is reported. This winter-killing of nursery stock resulted in failure to ship plant material in the quantities anticipated earlier in the season. Numerous nurseries have exhausted their stock of certain varieties and have been unsuccessful in obtaining replacements from other firms. Nurseries in the vicinity of Hartford, Conn., have been unable to meet the demand for California privet replacements. Many home owners in that locality are said to be replanting with Japanese barberry. A number of nursery-men have advised prospective purchasers to beware of bargain sales of nursery stock unless they are assured that the plants have not been winter-killed.

Large-sized Japanese beetle traps will be sold at \$1.50 each by the New Jersey Department of Agriculture if orders are received for a total of 1,000 traps. According to a printed State announcement, the sales plan has been adopted in response to a demand by many residents of the State for an efficient trap. Traps of the type it is proposed to sell are not available through the regular commercial channels. Announcements illustrating the proposed type of trap to be sold have been distributed to garden clubs, municipal officials, county agents, and other interested officials or organizations throughout the State. In the proposed sales plan, three members of the New Jersey State Board of Agriculture are acting as intermediaries between those desiring to purchase traps and the manufacturer. The particular advantage of the advertised trap apparently is that it is provided with a 1-gallon perforated iron beetle receptacle and is supplied with liquid bait sufficient for a season's use. This permits capture of large quantities of beetles without the necessity for constant emptying of the beetle container in areas where large daily collections of the insect are made. A booklet of instructions is listed among the articles to be furnished with each trap. The sale announcement emphasizes the fact that the trap cannot be depended upon for direct plant protection but recommends use of the device for beetle population reduction and the establishment of a counter attraction near desirable host plants. Trap crops are also recommended when the traps are used in municipal control projects.

Sealed bids were received on March 26 for the sale of a large quantity of condemned automotive equipment and supplies. Included in the sale were twenty $\frac{1}{2}$ -ton steel box body Chevrolet trucks, fifteen $\frac{1}{2}$ -ton steel box body Model T Ford trucks, one 1928 Hudson sedan, four $\frac{1}{2}$ -ton Chevrolet station wagon trucks, 3 Whippet commercial coupes, nine $\frac{1}{2}$ -ton Whippet roadster trucks, 1 Defiance 2-ton truck with 600-gallon tank, 1 Defiance 2-ton truck with semitrailer, 1 Defiance $3\frac{1}{2}$ -ton truck chassis, 1 flat-bottom scow, 1 lot miscellaneous junk metal, 1 lot junk tires and tubes, 1 lot junk automobile batteries, and seven 2-wheel plow trailers. Part of this equipment was formerly used for corn borer control and part on the Japanese beetle project. Proposals were invited on March 14. All equipment offered for sale was assembled for bidders' inspection at the New Cumberland warehouse. Notices of award were mailed to successful bidders early in April and all equipment was removed from the warehouse by April 17. The total realized from the sale was \$2,688.57. In addition 20 Chevrolet $\frac{1}{2}$ -ton trucks and 2 Chevrolet de luxe delivery trucks were junked, the serviceable parts salvaged and the unserviceable

parts sold as junk in the above-mentioned sale. One Ford $\frac{1}{2}$ -ton truck was also sold at Storrs, Conn. Three boards of survey were required to direct the condemnation and disposal of this old equipment.

G. S. Bliss, in charge of the Weather Bureau office in Philadelphia, in commenting at a recent meeting upon the results of the past winter said, "The peach crop is reported as virtually ruined. Other orchard fruit trees suffered heavy damage. Winter grains do not seem to have suffered great damage due to the heavy snows forming protecting blankets. One day in February, the 9th, was the coldest day in Philadelphia during the past century." A report on the same subject by the Pennsylvania Department of Agriculture states: "The unusually severe winter was hard on stone fruits. Peaches are reported to be a failure, or practically so, in most sections of the State, but it is too early to approximate the extent of the damage and the crop may turn out better than expected. Young peach limbs have suffered considerable damage from freezing, especially in the northern and western parts of the State. There will be practically no sweet cherries, but sour cherries at this date still promise to be a good crop. So far, practically no damage to apples and pears has been reported."

Elephants on wheels proved rather disconcerting to the road inspector stationed on U.S. Route No. 40 on the West Virginia-Pennsylvania line. Early in April a traveling circus en route from Pittsburgh to Wheeling passed the road post, the various trucks halting for quarantine information. The road inspector was at his station in the center of the road making the routine inquiries of the truck drivers. A number of the trucks contained circus animals, among which were several elephants. While one of the trucks was stopped, the inspector saw the wooden inspection booth at the side of the road suddenly sway and rise from the ground. Running around the front of the truck the inspector saw a large elephant with its trunk over the comparatively low sides of the truck. With its trunk through the open doorway of the booth, the elephant was busy lifting the building from the ground and teetering it from side to side. The inspector's yells at the animal had no effect in getting it to release the booth. Only when the trainer left the truck cab and used his hook on the elephant's trunk did the pachyderm release the booth, allowing it to drop upright with a thud.

C. W. Stockwell, senior administrative officer, in charge of Japanese beetle field work, transferred his official station on April 26 from Harrisburg to Philadelphia. This transfer of headquarters was effected for the purpose of having Mr. Stockwell stationed near the center of the nursery industry in the heavily infested territory. Since most of his work is contacting quarantine offices, nurserymen, and greenhousemen in heavily infested sections, it has been found advisable in the interest of curtailing traveling expenses to transfer his station to a point from which the majority of the important establishments may be reached in the course of a day's trip. Mr. Stockwell occupies office space adjoining the Philadelphia district headquarters in the Frankford Arsenal. He will keep in constant touch with the Harrisburg headquarters in matters pertaining to the field work under his immediate supervision.

Compliance with a vengeance was manifested by a motorist stopped at one of the quarantine vehicular stations and found to be transporting 8 uncertified potted plants from Pittsburgh, Pa., to a point in Indiana. When informed by the road in-

spector that the plants might be certified at the post by removal of the soil and its replacement with fumigated soil, the motorist refused to submit his plants for inspection. When further advised that in lieu of inspection the plants should be returned to the regulated area or surrendered at the post, the motorist angrily broke the rubber plant, 3 sansevierias, and 4 miscellaneous plants, threw the remains over a nearby bank, and hurriedly drove away. The incident occurred on April 10 at the highway station located on the Pennsylvania-West Virginia State line on Route 22, west of Paris, Pa.

Only two classified establishments exhibited at the 5th annual Baltimore Flower Show held from April 4 to 8. Exhibits of these firms were separated by wide aisles from uncertified stock of four other commercial exhibitors. Little checking of the material was required while the exhibits were being placed or during removal of the plants and soil at the close of the show. Private individuals, the Park Board of Baltimore, and members of the Federated Garden Clubs of Maryland comprised this year's principal show exhibitors. Private ownership of most of the stock shown eliminated the problem that frequently arises at many of the shows of borrowed stock exchanged by exhibitors to complete their displays. The show management cooperated fully in arrangements for the exhibition of certified material.

Memories of William Holmes McGuffey, American educator and author of McGuffey's First Reader, will be perpetuated by Henry Ford at Dearborn, Mich. A request was recently received by the Pittsburgh Japanese beetle quarantine office from a representative of Mr. Ford for permission to move shrubbery and plants from the McGuffey Homestead at Claysville, Washington County, Pa., to Dearborn. The prominence of McGuffey's First Reader in early educational work is such that the birthplace of this Presbyterian clergyman and educator is being reproduced as a unit in Mr. Ford's museum village. The homestead barns, sheds, fences, and shrubbery will be carefully moved and reerected in their original condition. The 60-acre McGuffey homestead was purchased by Mr. Ford last September.

April was an extremely busy month for all inspectors on the project. Necessarily delayed in their digging of outside-grown stock, because of frost in the ground, the nurseries immediately began their heavy movements of trees and shrubs as soon as the ground thawed. Contributing to the general rush, in addition to the shortened spring shipping season, was the fact that in many instances growers moved plant material in heavier volume than for many years past. Inspection and certification of quarantined articles during this peak month was performed by the regular appointed personnel, not a single temporary inspector having been employed to meet the increased demands for inspection service.

Passage of an ordinance by the Village Board of Scarsdale, N.Y., makes it impossible for a peddler of nursery stock to obtain a license in the village unless he can show a State inspection certificate together with proof of Federal Japanese beetle classification of the nursery where the stock originated. This ordinance was passed as a result of a warning against peddlers of infested nursery stock issued recently by the New York Department of Agriculture and Markets.

According to a recent magazine article, the former Pennsylvania district headquarters at Oakmont is being remodeled by the Canine Catering Company for use

as a wholesale plant in which to prepare an extensive line of dog meals to be distributed through a number of branch stores.

Plans for a Japanese beetle collection contest have already been discussed by the Spotswood, N.J., Garden Club. A small sum has been set aside for contest prizes. In last year's contest in Spotswood, 13 contestants were reported to have captured 518,000 beetles.

T. C. F. Cronin, assistant plant quarantine inspector, was transferred on April 21 from nursery and greenhouse supervisory work in the territory under the jurisdiction of the Boston office to the Harrisburg headquarters where he assumed charge of the trapping program in nonregulated territory.

Corn Borer Certification

Connecticut's annual corn borer clean-up began on April 18 under the immediate supervision of J. P. Johnson, district supervisor, and U. P. Zappe, of the Connecticut Agricultural Experiment Station. Twenty-one men, each equipped with a light truck, were assigned to patrol every road in the State to locate any fields or lots containing cornstalks. Connecticut General Statute 2125 prescribes that all corn stubble, flower stalks, and weeds known to harbor the corn borer larvae must be plowed under or destroyed by April 10. Prior to the State-wide inspection a series of mass meetings were held in a number of large cities. Corn growers were invited to attend these meetings to obtain information concerning control of the borer. Assistance of the corn growers of the State was also solicited in a series of newspaper articles distributed from the Agricultural Experiment Station. Inspection of fields where corn was grown last year in Rhode Island began early in April. The Rhode Island clean-up provisions make it mandatory that all corn stubble be plowed under or otherwise destroyed before April 20. This year, due to the wet condition of the fields in some portions of the State where corn is grown, the Commissioner of Agriculture extended the clean-up date to May 15. By the middle of April, Rhode Island inspectors had examined over 1,400 fields in which corn was grown last year and found to be infested. Notices were served on the owners that a thorough clean-up must be effected by April 20. Heavy rains in some parts of the State left many of the fields too wet to plow by April 20.

An announcement by the Connecticut Agricultural Experiment Station states that this winter's subzero weather has had little effect on overwintering corn borer larvae. An examination early in April of corn stubble in the shore areas of the State showed plenty of live borers.

Gypsy and Brown-Tail Moth Quarantine Enforcement

Mica mining in Connecticut, especially during dull seasons, often results in the heaping of as much as 1,000 tons of the mined product in woodland areas, thus subjecting it to gypsy moth infestation and necessitating inspection before the same may be certified for movement to noninfested territory. One mine which requires inspection services by the inspector in the Middletown, Conn., district employs 25 miners. Large quantities of mica are still used for glazing stoves. This was practically the only use for this material prior to the development of the electrical industry. Mica's heat-resisting properties and its transparency

make it practically the only material that may be used for stove windows or other types of windows subject to high temperatures. Connecticut mica now finds its chief use as an insulating material in electrical appliances. Electric irons and toasters, and other appliances utilizing electrical heating units, depend upon mica for their insulation. The resistance wire in the heating unit is wound on scales of mica especially designed for the purpose. The best grades of mica will withstand about 6,000 volts per thousandth of an inch thickness. Ordinary grades of mica used in electrical appliances have a dielectric strength of around 4,000 volts per mil of thickness. Since the mica in the usual electrical appliance is about 0.01 inch thick, there is a wide factor of safety. The development of aviation has also furnished another outlet for mica, that of insulation of spark plugs for airplane engines. Mica's high electrical insulating value, its heat-resisting qualities, and especially its ability to resist rapid deterioration under the frequent and extreme changes of temperature encountered in aircraft engines, make it the most suitable material known for this purpose. This material also is used for insulating from each other the various elements within radio tubes, at the same time preserving proper alignment and rigidity of the parts. New inventions have destroyed some markets for mica, but others have created new demands. So far, it appears that science has been unable to manufacture synthetically a product with the rare combination of useful properties possessed by mica.

On the basis of 400 or more eggs per cluster, inspectors during the month prevented the movement to noninfested territory of over 17,200 potential gypsy moths. Eight egg clusters were creosoted and removed from oyster buoy poles contained in a carload shipment of 500 poles consigned from Norton, Mass., to Cutchogue, L.I. Another 6 egg clusters were found on a truck shipment of 98 similar poles being transported from Wickford, R.I., to New Haven, Conn. A rhododendron submitted for inspection by a Rhode Island nursery prior to shipment to New Haven and an azalea certified for shipment from the same nursery to New York City each yielded a single gypsy moth egg cluster. At Concord, N.H., 20 clusters were removed from stakes and blocking used on 4 carloads of granite consigned to Long Island. One cluster was found during the inspection of a carload of paving shipped from Milford, N.H., to Brooklyn, N.Y. Examination prior to loading of a carload of old brick from a demolished hotel at Westerly, R.I., resulted in the removal of 2 egg clusters. After the hotel was razed, the cleaned bricks were piled near trees where they were exposed to gypsy moth infestation during the 1933 egg laying season. This shipment of brick will be used in building a home on Long Island. Inspection in the Quincy, Mass., district of a quantity of lumber prior to its storage in a protected shed for future use as cleating in securing shipments of quarry products disclosed an additional 4 egg clusters, making a total of 43 clusters removed from quarantined products during April.

Road patrol operation on the principal exit highways from the lightly infested gypsy moth area of Connecticut began on April 14. By the end of the month 2 roads were being guarded by 3 inspectors each for a period of 13 hours daily. Two other inspectors provided with cars alternated between 8 highways on the border of the lightly infested zone in the vicinity of New Haven and Waterbury. Highways on which there are located established posts are the Boston Post Road (U.S. Route No. 1), and the principal entrance highway to New Haven from Hartford and Meriden. One of the mobile inspectors alternates between 2 posts, spending 4 hours at each on a staggered hour daily schedule. The second roving inspector

staggers his work between 2 posts on 1 day, spending 6 hours at the more important post and 2 hours on a less traveled road. On alternate days the latter inspector's 8-hour tour is equally divided between 4 less frequented highways to intercept vehicles attempting to evade the established inspection stations.

Bobbin manufacture at East Corinth, Vt., is one of the native industries contacted by the inspector in the White River Junction, Vt., district. This manufacturing concern recently completed a modern electrically operated mill where logs, after being placed in warm water to remove the frost, are cut into lengths from which rough bobbins are turned. The bobbins are then dried for a week or 10 days in steam kilns, after which they are finished, polished, and dipped in shellac. Trucks and teams haul to the mill the birch, beech, and maple logs from which the bobbins are turned. Most of this raw material is procured within a radius of 30 miles. Products of this concern are shipped all over the world. At the present time they are able to market the finished bobbins as fast as they are ready for shipment. Recently 5 large truck loads of bobbins were delivered to points in North Carolina, South Carolina, and Alabama. Fifty 100-pound sacks comprise a truck load. The truck used in these deliveries continued to Florida after delivering the bobbins and returned north loaded with Florida fruit. Approximately 3,000 miles were covered on each round trip.

Increased shipments of nursery stock were reported by district inspectors at Newport, R.I., Wakefield, Mass., and Portland, Maine. A fourfold increase in nursery stock certification was reported in the latter district. An extensive advertising campaign carried on by a nursery located in both Maine and New Hampshire is believed to have contributed to this large increase. One of the nurseries in the Manchester, Conn., district is supplying nursery stock to all branches east of Buffalo operated by one of the well known 5 and 10 cent store chains. Another nursery in this same district recently shipped 700,000 conifers to one of the Pennsylvania State parks. Five carloads of trees, 15 to 25 feet in height, were shipped from a nursery in the Middleboro, Mass., district to Rochester, N.Y., for planting on a college campus. Prior to shipment the burlapped soil ball of each tree was wired to an individual wooden platform, and the tree thus forwarded to destination.

As late as the middle of April there remained 18 inches of frost in the ground of one large nursery in the Keene, N.H., district. In ordinary years nursery stock may be dug in this territory about March 15. By April 1, full crews usually are working overtime to get orders dug, packed, and shipped. This year it was possible on April 15 to dig stock in only those parts of nurseries fully exposed to sunlight. Should the weather in this district suddenly warm up, considerable extra help will be hired at the nurseries in order to get orders shipped on time. Soil in a nursery in the Framingham, Mass., district was so frozen at the end of April that difficulty was experienced in digging closely growing 12- to 14-foot Norway spruce trees. Below a depth of 6 or 8 inches the soil was still frozen. In order to obtain a good ball of soil it was necessary to remove the thawed surface soil and wait several days for the sun to thaw out the subsoil.

William Sarsfield, senior scientific aid, gypsy moth inspector in charge of the Milford, N.H., district, was retired at the age of 70 on April 30. Mr.

Sarsfield first was employed on gypsy moth work under the Bureau of Entomology in November 1906. Since 1925 he has been in charge of gypsy moth enforcement work in the Milford district, one of the important granite-shipping districts in the generally infested gypsy moth area. Prior to his employment in the Bureau of Entomology he was a granite cutter. His intimate knowledge of the granite industry greatly assisted him in supervising shipments from the large number of quarries in his district. Until the time of his retirement, Mr. Sarsfield continued to cover most of his district afoot, preferring this mode of travel to driving a Government automobile. Towns in the Milford district have been reallocated and the work assigned to H. I. Winchester, formerly stationed at the Boston office. Mr. Winchester has established his headquarters at Nashua, N.H.

Favorable comments on his new uniform were received from the district inspector at Greenfield, Mass., as follows: "The new uniform which I was requested to purchase and begin wearing on April 1 has proven in one month's time the wisdom of its adoption. In the border towns in the lightly infested area where the enforcement of quarantine regulations is more difficult, I have experienced more courtesy and much better cooperation from shippers, especially in the border towns where the method of transportation is via truck. Much of this area is in mountainous and hilly sections where long-distance hauls are necessary to reach cities and railroads. During the past winter many of the roads were impassable for months, and at this writing (May 1) in one place where the snow had badly drifted, it is over 4 feet deep. Inspections in these towns during the winter months require the inspector to put in long days and make hard trips, so that full cooperation by the shippers is appreciated."

Increased employment was noted during April in the Barre, Vt., district. On April 16 some 40 men reported for work at two quarries at Barre. Many of these men had been unemployed for 6 months or more. A considerable number of workers had been taken on by the quarries from week to week in March and April, but the middle of April reemployment was the first considerable number of men added at one time. Operation of a derrick closed since last fall put 15 men to work. Another derrick in a second quarry, inactive during the winter, was set in operation with the employment of 15 quarriers. A saw plant in the latter quarry also started operating with 3 shifts of men instead of the 2 shifts previously employed. Still another quarry started operations at 7 a.m. instead of 8 o'clock. There were prospects at the latter plant that the half day's work on Saturday would be eliminated and a 5-day week inaugurated.

Flooding of granite quarries at Milford, N.H., has required in some instances from 4 to 6 weeks' pumping to drain them before the season's work could be started. These quarries vary greatly in size, ranging from one to several acres in extent. Excavations at old workings sometimes reach a depth of 200 feet. Heavy snow and rainfall this winter have resulted in many of the quarries flooding almost to the top. Unlike mountain lakes the water does not have a blue, transparent color but usually presents a jade, opaque appearance, probably due to a solution of chemicals from the newly cut granite sides and bottom. Each spring there is an accumulation of water to be pumped out before cutting is resumed. This year's accumulation is unusually deep.

Cranberry cuttings to the extent of 100 barrels were certified for movement

from Carlisle, Mass., to Upton, N.J., for use in planting a new cranberry bog. In gathering these cuttings, the plants in the center of a 40-acre bog were mowed with a scythe. The cut branches were then raked up and tightly pressed into flour barrels. A general inspection of the bog was made, since there were no nearby trees or shrubs from which an infestation would be likely to spread. Prior to shipment the cuttings were soaked in a brook for a day to prevent them from drying out en route to destination.

Certification was granted during April for a small butternut tree dug on the old homestead of the late Calvin Coolidge at Woodstock, Vt. This tree was shipped to the Bureau of Plant Industry, Washington, D.C., by representatives of the Vermont State Forest Service and the Woodstock Chapter of the Daughters of the American Revolution. Another certified shipment made for its sentimental value involved small oak trees dug from an oak grove on an old homestead at Norwichtown, Conn., and shipped to Nebraska.

Despite the fact that there was more activity in the forests in the White River Junction, Vt., district than for the past 2 years, shipments of forest products were comparatively few during April. Impassable dirt roads and a ban on the use of the principal highways for heavy hauling prevented removal of the timber from the woodlots. Quantities of ash, birch, beech, maple, and spruce logs were cut. Apparently there is a demand for all of these forest products.

Material for an exhibit depicting the various steps in the manufacture of ladder rounds was certified by the Plymouth, N.H., inspector for shipment to a store in Newark, N.J. The exhibit material was shipped by a small factory which still turns out these rungs by hand labor. Comprising the shipment were 376 ladder rounds, four 20-inch lengths of round oak logs in the rough, 4 pieces of split oak logs, 1 bundle of square pieces, and 1 bag of shavings.

Two 66-ton marble blocks were recently quarried in the Rutland, Vt., area. These monster blocks are the largest single pieces of marble ever quarried by the producing company. After cutting and polishing, the blocks will be used in the entrance buttresses of the United States Supreme Court building in Washington, D.C.

One of the quarries receiving certification from the district inspector at Bangor, Maine, started during April to cut several thousand feet of granite curbing for one of the elevated speedways in New York City.

MEXICAN FRUIT FLY

The first larval infestation in Texas fruit since the spring of 1932 was found during the latter part of April. This infestation was found in fruit gleaned from the trees in the Kinkadee grove in making the tree-to-tree inspection, following the opening of the host-free period. The infested grove is located about 7 miles north of Mission. Six infested fruits were found in this grove from

which 115 larvae were taken. Further inspection resulted in finding 1 infested fruit containing 4 larvae in the grove adjoining the Kinkade grove on the east, and 3 fruits from which 28 larvae were taken in a grove about 200 yards northwest. Of particular interest in this finding was the fact that 2 of the infested fruits were "off-bloom", one of which was only about one half mature. In all, 178 larvae of ludens were taken in the 4 infested groves. An additional infested fruit was found on the last day of the month in a grove just east of Mission and about 7 miles from the other infested properties.

The operation of 5,180 traps resulted in the taking of 44 adult A. ludens during April, which was less than a third of the number taken during March. Of these, 7 (6 females and 1 male) were taken in traps located in the brush. Whether the absence of fruit in the groves is forcing the flies to the brush in search of fruit for oviposition or whether there is a native host is a question which it is hoped will be settled this summer. One inspector in each district has been detailed to operate traps in the brush and to make collections of native fruits and berries for pupation tray studies. Some 118 collections of native fruits were made during the month. A number of trypetid larvae (probably Zonosema) emerged from collections of fruit of a Solanum, but no adults had emerged from the pupae by the end of the month. No emergence from other fruits was observed.

In addition to ludens, specimens of A. species "X", A. species "Y", A. fraterculus, A. serpentina, A. pallens, and T. curvicauda were taken in the traps. Of interest was the fact that only 1 serpentina was taken during the month, while 93 pallens were taken. During the past several months the curve of serpentina has been downward with a corresponding upward curve for pallens. In Mexico serpentina is recognized primarily as a sapote feeder; the known host of pallens in the Valley is the Bumelia which belongs to the Sapotaceae. Accordingly, some interrelation in the feeding habits of serpentina and pallens is indicated by the decrease in the number of serpentina and the corresponding increase in the number of pallens taken.

Weather conditions were favorable for spraying throughout the month. The power sprayer purchased by Hidalgo County was placed in operation on the 9th. The two rigs operated a total of 41 sprayer days during April, spraying 24,838 trees on 71 properties. With both sprayers operating and a decline in the number of ludens taken, spraying operations were not far behind the infestations turned up by the traps.

The harvesting period of the 1933-34 crop closed with the termination of April 5. All growers having any commercial fruit were contacted prior to that date and advised of the regulations. All fruit, except that overlooked in cleaning the trees, was harvested prior to the closing date and shipped or placed in proper storage. Immediately on the opening of the host-free period the inspectors started in on the tree-to-tree inspection work. Due to the light crop and good prices, the groves had been exceptionally well cleaned by the picking crews and owners. The small amount of "off-bloom" fruit in the groves materially reduced the necessity of a close check in the groves. The tree-to-tree inspection in previous years has been done by crews of day laborers working under the district inspectors. Even under as close an examination as this, an occasional fruit was overlooked. It was felt, therefore, that in view of the exceptionally small amount of fruit remaining in the groves, the funds required to make the tree-to-

tree inspection with laborers could be much more advantageously invested in an additional supply of glass traps. Accordingly, the inspectors were instructed to check the groves closely enough to satisfy themselves that no appreciable amount of fruit was left in the trees. The work was practically completed by the end of the month.

At the same time the tree-to-tree inspections were made, the census notes were corrected, where necessary. Upon completion of the tree-to-tree work full time, aside from trapping, will be devoted to correcting the census notes. This work is extremely difficult this year, particularly in the eastern half of the Valley, because of the high mortality occasioned by the hurricane of September 4. It is hoped to have this work completed by the time the additional traps are received in order that full time may be devoted to the trapping work during the summer.

Only two adult ludens were taken in the traps operated on the Mexican side of the river from Matamoros to Reynosa. Both of these were taken in Matamoros, all other traps giving negative results. The mango situation at Matamoros remained unsettled during the month. As reported in the last News Letter, the dealers in the State of Michoacan were prohibited by the Mexican Government from shipping mangoes to Matamoros. Seemingly, this order was evaded by shipping the fruit to Monterrey and having it reconsigned to Matamoros from there. In the absence of specific instructions from his superiors, the local Mexican inspector was loath to take any drastic action on his own responsibility and it was not deemed advisable to push the matter very strongly at the time. Some 46 boxes of mangoes were received during the month from which 500 larvae of ludens were recovered. During the latter part of the month collection of spoiled fruit on the market was made twice daily in order to hold to a minimum the dissemination of infested fruit through the city.

PINK BOLLWORM

The sterilization of planting seed in the Western Extension of Texas, mentioned in the last News Letter, has been carried forward throughout the month. Twenty-two sterilizers were operated at various gins throughout the area, each machine being supervised by a trained inspector. After completing their runs in Texas two of the machines were moved to the two involved counties in New Mexico. By the end of the month most of the seed had been treated, but several of the machines operated at intervals until the 9th of May. In the Texas counties some 4,300 tons of seed were treated belonging to 4,723 farmers, and in New Mexico about 115 tons belonging to 246 farmers. This amount of seed sterilized is considerably less than the gin records show was carried back to the farms. Many farmers have reported selling some of the seed returned to the farms to gins and oil mills and others have used the seed as feed. Therefore, when the final records are obtained, it is believed that practically all of the seed will be accounted for.

During the above program the farmers have exhibited a splendid spirit of cooperation. As an outstanding example an elderly woman got up at 3 o'clock in the morning and drove a team 26 miles to bring her seed to the sterilizer. After it had been treated she told the inspector that she would probably reach home about midnight. There were other instances which showed that the people were interested in the work. One farmer collected a quantity of wireworms, placed them in a tobacco sack and ran them through the sterilizer. When recovered all of the worms were dead, and this farmer gave considerable publicity to the incident, stating that he was convinced sterilization would destroy any pink bollworms. In many cases the seed was sacked immediately after sterilization and, of course, was still quite warm. One farmer placed two eggs in a sack of seed to see whether the eggs would be cooked. The inspector supervising this particular machine was going around to various sacks inserting his arm in the seed to see how hot it was. Not knowing of the farmer's experiment with the eggs, the inspector happened to test this sack, and upon withdrawing his arm found it covered with raw eggs up to the elbow.

The eradication of wild cotton in southern Florida progressed satisfactorily during April. Due to the isolation of the cotton the work was handicapped in some sections, this being particularly true in the area between Cape Sable and the town of Everglades. The program on Cape Sable was concluded for this season the latter part of the month. In view of the fact that the work was being carried on at a considerable distance from the camp, it is felt that a great deal was accomplished. All of the area previously cleaned was gone over and in addition a great amount of cotton in new areas was removed. On the extreme eastern edge of Cape Sable there is an area in which considerable wild cotton still exists; however, it was too late in the season to open trails so as to get the crews to the cotton. This is the only area on Cape Sable in which virgin cotton still exists.

The recleaning of the mainland keys from Key Largo southward to Lower Matecumbe has been completed except on Key Largo. On Key Largo the area already covered this season embraces by far the larger portion of the cotton-growing area. In the area yet to be covered the colonies are not only much smaller but more scattered. A crew has also continued the cleaning of keys in Florida Bay. These keys are being cleaned without any undue hardship.

In connection with the keys in Florida Bay, an amusing incident happened; however, it could have been very serious. The crew is camped on a key, and naturally all food and drinking water has to be brought in by boat. One of our inspectors was going for a supply of drinking water and was sitting on a barrel. A wave caused the boat to lurch suddenly and the inspector fell overboard, but the boat continued without anyone to guide it and finally ran into the shore. Fortunately the water was only waist deep, but it took the inspector about an hour to reach the boat, which had not been damaged.

The transferring of cotton plants from the hotbeds to the field plots in the Big Bend of Texas was begun the first of the month. After a considerable number of plots had been set out a severe rain and hailstorm was experienced. The cotton was completely destroyed in five plots and was damaged somewhat in the others. There were sufficient plants in the hotbeds to do all the replanting necessary and complete all of the 25 plots that had been planted. Each of the

plots contains 400 plants. The plots have recently been irrigated and cultivated and the cotton is now 6 to 8 inches tall and making very good growth. A light application of nitrate of soda will be given after the next cultivation to hasten the growth. The two plots in Brewster County continue to make good growth; in fact, they are a little in advance of the plots in Presidio County. This is attributed to the fact that the cotton in Brewster County was planted in the field, whereas in Presidio County the cotton was grown in hotbeds and then transferred to the fields, and this transferring seems to retard the plants for several days. However, as the delayed planting date was observed 100 percent, the trap cotton should be well in advance of the main crop.

Several fields in the Presidio section produced some stub cotton. In one particular field it was found that there were sufficient stub plants to be used as a trap; therefore, some 55 plants were saved for this purpose, but the remainder was destroyed. This stub cotton has been making very rapid growth and is expected to begin producing blooms by the middle of May. A prominent farmer of the area has suggested that we might be able to utilize stub cotton for our trapping needs another season by cutting the stalks early in the fall and then banking with a layer of dirt. With this in view the stub plants being used this season will be watched very carefully.

No work was carried on at the San Antonio laboratory during the month, as the inspectors were being used on the seed program. At several of the field stations samples of bolls and bollies have been inspected. A few specimens of the pink bollworm have been found, none of which were in areas where gin-trash inspection had not already shown infestation. As this is being written the inspectors have just returned to the San Antonio laboratory and resumed the inspection of green bolls. In bolls which were collected last fall in Yoakum County, Tex., one of the counties involved in new gin-trash findings this season, five specimens of the pink bollworm were found. This represents a 0.62 percent infestation, and it is very evident that it is possible to determine even a light infestation by the laboratory inspection method.

PREVENTING SPREAD OF MOTHS

Early in the spring a considerable amount of information has to be obtained with respect to the areas selected for spraying operations on gypsy moth control, so that when the proper season for spraying arrives the crews may move to those areas and be able to undertake the work without undue delays. Areas for spraying are selected after a consideration of the records obtained during the scouting operations of the fall and winter season. While every attempt is made to destroy all infestations at the gypsy moth colonies found while scouting, it is often necessary, because of the severity of the weather or forced decrease in the scouting personnel, to discontinue work at some of the infestations before complete eradication is possible. Then, too, infestations may be found so late in the season that treatment of the egg clusters has to be discontinued before the work

is complete, as the season is advanced to such an extent that hatching has commenced. In the selection of areas to be sprayed various points are considered, particularly the nearness of such infestations to the barrier zone and elevations of the localities at which they are situated. The nearer the zone and the greater the elevation, the more dangerous the infestation becomes, as there is a greater probability of wind spread into the barrier zone itself. After the areas for spraying have been selected, it becomes necessary to make quite thorough surveys to determine extent of these areas, property lines, and nature of growth. No spraying is performed unless permits are obtained for this work from the owners of the property and, in many cases, individual holdings are so divided that several permits may be necessary for the same area. In general, it can be said that owners of property are willing to give such permits but, in numerous localities, allowances have to be made for grazing areas. Throughout a good bit of the territory in which scouting and other control measures are undertaken a considerable number of cattle are raised and, oftentimes, pastures adjoin woodlands which are infested. As there is considerable danger involved through cattle feeding on poisoned foliage, it is necessary to fence off areas so that cattle cannot reach any foliage that has been sprayed with arsenate of lead.

In addition to obtaining permits, locating property boundaries, arranging for the fencing off of areas to be sprayed, and some other details, the men engaged in the work preliminary to spraying have to locate adequate water supplies so that the spray trucks may have sufficient water at all times. Estimates are made of the amount of hose necessary to reach from the points at which the sprayers are to be located to all parts of the area to be sprayed. When the information is complete it is in sufficient detail so that the crews can move in and begin operations with little, if any, delay and the men in charge have all information necessary for each particular point.

In addition to many other items of equipment regularly used by men who are employed on gypsy moth work, it was found necessary to issue snowshoes to scouting parties, particularly in northern Vermont early in November, as we had a heavy snowfall October 25 and there were frequent snowstorms after that time until late in March. By January we had issued approximately 1,200 pairs of snowshoes--the maximum number used during the winter. Snow continued to accumulate to great depths in the woods throughout February and March, and it was not until about April 1 that scouts could get about comfortably without snowshoes. By April 15 the use of this equipment had been entirely discontinued.

In spite of the fact that a great many of the men had never used snowshoes they learned to walk on them with ease very quickly, and a large majority of the snowshoes were returned to the storehouse this spring in very good condition. As fast as they were returned the oil-treated foot-harnesses, which had dried out from frequent wettings from snow-water, were removed and coated with neat's-foot oil. All broken parts were either repaired or discarded. The harnesses are comprised of two or more straps and a toe piece, or sandal. They were securely tied up in bundles of 10 and stored in such a way that they would not be damaged by rats or mice.

Shoes were then sorted according to condition: First, those that showed no signs of breakage or wear; second, those that had suffered some wear or minor break-

in the webbing (which could be easily repaired by our own men); third, those that had badly broken webbing and would, of course, have to be entirely rewedded by an expert; fourth, those with broken frames which would have to be discarded.

Men employed by this project made what repairs they could on the snowshoes, using for webbing, hide especially cured and cut in the widths required for this particular purpose. This hide, as purchased, is very hard and must be soaked for several hours in lukewarm water, which leaves it very soft so that it can be easily worked and stretched very tightly. A specially constructed vat, capable of holding some 5 or 6 gallons of varnish, was used for dipping the snowshoes. Two gutters, or troughs, each approximately 12 feet long, were set up in such a manner that the excess varnish dripping from the snowshoes which were hung directly over the troughs ran back into the dipping vat, and there was comparatively no wastage. The ideal temperature for dipping was found to be between 85° and 90° F. The shoes having previously been dried for a few hours in the open room were, of course, about the same temperature so that the varnish was not chilled. It was found that two men could handle and dip about 250 pairs of shoes per day. Strips, to which ceiling-hooks had been attached, were set up. These wooden strips had a capacity sufficient to accommodate about 175 pairs of snowshoes. Snowshoes, newly dipped, were transferred to these strips from over the troughs just as soon as the varnish had stopped dripping from them. They were allowed to hang over night before receiving the second coating of varnish. Only a high-grade "Marine spar" varnish is satisfactory for snowshoes, as it must be elastic, tough, and thoroughly water resistant. It requires about 1 gallon of varnish to dip 50 pairs of snowshoes once; this varies somewhat, according to the temperature and consistency of the varnish. Strips, provided with hooks, have been attached to the rafters of one of the storage buildings, and the snowshoes will be hung from these hooks where there will be no danger of damage from moisture or injury from rats or mice. If properly stored snowshoes will remain in excellent condition for many years. It is not proposed to varnish the snowshoes requiring new webbing or extensive repair; these will be stored similar to the others until such time as we are able to have them reconditioned by a snowshoe manufacturer. Shoes with broken frames will be tied up in bundles and disposed of at the first opportunity.

Gypsy moth egg clusters have begun to hatch in a number of localities. The earliest date reported from the areas in which Federal control work is being performed was May 2. On that day hatching commenced at some localities in the infested area in Pennsylvania and in a number of places in the western part of the infested area in Connecticut. In Massachusetts and southern Vermont the first hatch recorded was several days later. Those egg clusters which were deposited close to the ground on the bases of trees, in stone walls, or on debris on the ground, and which received the fullest protection from the deep snow blanket during the extremely cold weather of the past winter, apparently are going to hatch more completely than those which were deposited high in the trees and exposed to all of the severities of the weather. Because of the unusual nature of the past winter, many reports have been published in the daily papers listing the low temperatures recorded. All of these reports have emphasized the lowest temperatures which, in many cases, were considerably below those which had been recorded in the past. Except for those records taken from official thermometers, there may be some question on the exact degree of cold experienced, as the lowest reading reported by anyone is the one which receives the greatest publicity. Temperature is an extremely variable factor and there may be, and usually are, differences of many

degrees between points which are sometimes not widely separated. Although winter-killing of gypsy moth eggs in clusters which were above the snow protection was extensive in some localities, this condition is by no means universal and hatching has been noted in clusters which were well above the protection line. This hatching in part, or in whole, of "high" clusters is not confined to any one section but has been noted at numerous points in the area where control is being conducted. Knowing the effect that severe cold has on gypsy moth eggs and the temperature at which killing takes place it is safe to say that in spite of the published records there were many points at which the actual minima were decidedly higher than the accounts would lead one to suppose.

The winter of 1933-34 was the most severe that has been experienced in the Northeastern States for many years. Temperatures were abnormally low; and, in most sections, there was an unusually heavy fall of snow. During the winter, temperatures in many sections of New England dropped to -25° F. and, in some localities, as low as -40° was recorded. Almost every year some of the gypsy moth eggs that remain on the trees during the winter fail to hatch the following spring. During the present year this condition will be more noticeable than usual, because extremely low temperatures are fatal to eggs that are not protected by snow, ice, or in other ways. From a limited number of records it has been determined that a very large percentage of the egg clusters that have been protected by snow have hatched, and even, in some localities, egg clusters deposited above the snow line have hatched to a considerable extent. On the average, however, the rate of mortality is much higher than in normal years, and this condition should be taken advantage of in carrying on control work in the immediate future.

It goes without saying that the time to wage the most effective warfare against an insect is when its numbers have been reduced to a minimum, and this would indicate that the present is the time when intensive work should be conducted, on as large a scale as possible, in order that maximum results may be secured.

The difficulties of insect extermination are extremely great. This is well illustrated in the State of New Jersey where an area of more than four hundred square miles was infested with the gypsy moth and the insect was exterminated. Federal work in this State was finished July 1, 1932, but the State of New Jersey has since that time maintained a small force as a matter of insurance in order to check up the conditions in areas where bad infestations have existed in the past, or places that seem to be particularly susceptible to reinfestation. Last spring a small infestation was found by this force near Morristown, N.J., on the outside rim of the area that had previously been infested. One hundred and twelve egg clusters were treated, and the surrounding area sprayed. This infestation was located on a high elevation, and scouting conditions were unusually difficult on account of the presence of large numbers of ledges, boulders, and smaller rocks, which made careful ground treatment extremely difficult. This spring three small egg clusters have been found in this territory, and the scouting work is not completely finished, but the area is being carefully worked, and it is hoped that this infestation will be cleaned out during the present year.

The plan of work in New England and New York contemplated the scouting and clean-up of selected areas where previous infestations had been located, in southwestern Massachusetts and the central and northwestern sections of the barrier zone

in Connecticut. It also provided for similar work in territory between the barrier zone and the Connecticut River in Vermont, Massachusetts, and Connecticut; particular attention being paid in Massachusetts to woodland areas where little, if any, work had been done by local authorities. As a result of the work carried on there have been discovered severe and threatening infestations along the Connecticut River in the southern part of the State of Vermont, and throughout the area between the barrier zone and the Connecticut River in Massachusetts. In Connecticut many severe infestations have been found, but the territory is not as heavily infested. This is attributed largely to the fact that since the barrier zone was established most of the State work in Connecticut has been done in the area between the zone and the river. By concentrating the work in this area it has been possible not only to prevent the establishment of many infestations in the woodlands, but to scout and treat a far greater amount of woodland area than has been possible in Massachusetts and in Vermont.

A tremendous amount of work has been done during the past winter, as a result of the availability of N.R.A. funds, and the total has been increased by gypsy moth work that has been carried on from Civilian Conservation Corps camps, where men have been assigned to work under the direction of trained gypsy moth foremen and supervised by the Greenfield office of the Bureau of Plant Quarantine.

Camp superintendents, gypsy moth foremen, and enrolled men at Civilian Conservation Corps camps have been supplied with literature pertaining to the gypsy moth, including colored cards and charts. Numerous talks and showings of gypsy moth motion picture reels have been given at the various camps. In April it was difficult and, in some cases, impossible to get into some of the camps because of the condition of the roads. Toward the end of the month, in most cases, the roads had dried out so that it was possible to visit practically all of the camps. Work was seriously curtailed during April, due to a turn-over in the personnel, necessitating a reduction in the number of men on gypsy moth work in proportion to the numbers of men in the camps. This change in personnel also slows up the work. During the last month, however, the quotas were being rapidly refilled.

A report of the Civilian Conservation Corps gypsy moth work through March 1934 shows that in Massachusetts, Connecticut, and Vermont, work has been done in 38 towns. Over 220,000 acres of woodland and 122,000 acres of open country have been examined. Over 1,200 miles of road and half a million individual trees have been examined. These trees do not include woodland trees, but are trees found along the roads in villages, pastures, and orchards. Up to this date over 120,000 gypsy moth egg clusters have been creosoted, and approximately 160 acres of woodland cleaned and over 400 trees destroyed. Work has been conducted from 18 different camps. One in Vermont, 5 in Massachusetts, and 7 in Connecticut are United States Department of Agriculture Camps, and 5 in Massachusetts of the United States Department of the Interior. A total of over 55,000 man-days of work, based on 6 hours a day, has been performed.

The proper State officials have been requested to keep the gypsy moth quotas as full as possible through the month of May, after which a sharp reduction in the number of men can be made for the month of June, July, and August. During this period it is hoped that small crews of men will be available to do burlapping at the sites of infestations that have been found. The trees banded with burlap will



need to be patrolled so that the caterpillars and pupae, which assemble under the burlaps, can be crushed. The degree of gypsy moth infestation can be very much reduced at these infestations by carrying on such work during the summer. Other work, which will help in the fall program, can be done during the summer months, such as cutting town lines, woodland mapping, lettering roads, and locating sites of infestation based on the discovery of old egg clusters. Such sites can be marked on maps of the towns and will help in conducting the winter work.

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