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NEWS LETTER

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VOLUME III

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UNITED STATES DEPARTMENT OF AGRICULTURE
BUREAU OF ENTOMOLOGY AND PLANT QUARANTINE

NEWS LETTER

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FRUIT INSECT INVESTIGATIONS

The relation between temperature, sunlight, and sunlight with ultra violet partly eliminated, and the decomposition of derris.--R. D. Chisholm, of the Moorestown, N. J., laboratory, reports that three derris combinations were exposed to the sunlight in a greenhouse, southern exposure, at a temperature of 70-75° F.; three were exposed on the sunrack in the open; and three were exposed in the dark at 70° and duplicates at 37°. Fans maintained a circulation of air. The most complete decomposition took place in the greenhouse, in spite of the fact that the plates were behind ordinary glass. During the period of exposure there were only 2 days of bright sunlight. The derris deposits on the plates in the sunrack showed less decomposition. During the period of exposure low temperatures existed. The sunlight was the same as for the greenhouse exposure. The metal sunrack cover was over the plates except when the sun was shining. Therefore the actual sunshine for the plates in the greenhouse and on the sunrack was equal, although the greenhouse plates were in ordinary daylight much longer. The other difference was temperature. The derris deposits on the plates in the dark showed no appreciable decomposition either at 70° or 37°. From these observations it would seem that light is the principal factor in the decomposition of derris and that the higher the temperature the more rapid the decomposition will be.

Permanence of turf treatments in protecting grass from injury by Japanese beetle larvae.--W. E. Fleming and F. E. Baker, Moorestown, reporting on results of turf treatments on the campus of Swarthmore College, Swarthmore, Pa., state that in the spring of 1931, 17 plots of approximately 1 acre each were laid out on the College campus, which was heavily infested with Japanese beetle larvae, for the purpose of conducting experiments with lead arsenate. Two of the plots were left untreated. The remaining plots were treated with lead arsenate in combination with five different carriers, using the lead arsenate at the rate of 5 pounds to 1,000 square feet. In October 1931 two-thirds of each plot were retreated, and in May 1932 one-third of each plot was retreated. Thus, when the applications were completed in May 1932, the lead arsenate had been applied at the rates of 5, 10, and 15 pounds per 1,000 square feet. The data obtained from the surveys of the different plots show that an application of lead arsenate at the rate of 5 pounds to 1,000 square feet will not reduce the density of the larval population in turf for a period

longer than 2 years, while the applications at the rate of 10 or 15 pounds per 1,000 square feet still maintain a practically complete elimination of larval population approximately 4 years after the initial treatment. It is apparent that not less than 10 pounds of lead arsenate is required per 1,000 square feet of established turf to assure protection of the grass from larval injury for a period of years. It was also found that the lead arsenate was equally effective whether applied as a spray or mixed with sand, tankage and sand, or activated sludge and sand. The addition of a complete fertilizer containing acid phosphate, ammonium sulphate, and muriate of potash, or the addition of greensand marl to the lead arsenate destroyed the insecticidal value of the lighter applications and decreased the effectiveness of the heavier applications.

Cross-breeding parasites of the Japanese beetle.--T. R. Gardner, Moorestown, reports that during the fall of 1934 propagation work was carried on with crosses of the Korean strain and Japanese form of Tiphia popillivora Roh. to determine the time of progeny emergence of these two strains. Propagation work was carried on with both the Korean strain and Japanese form for comparison. The host grubs used, which were in the third stage, were parasitized at approximately the same time in the fall of 1934, and the resulting Tiphia cocoons were all stored in the same temperature-controlled chamber throughout the hibernation and development period. The emergence of this material in 1935 was as follows:

Cross	Period of grub parasitization in 1934	Period of emergence in 1935
K female X K male	Sept. 13 - Nov. 6	Aug. 19 - Sept. 16
K female X J male	Sept. 16 - Oct. 30	Aug. 20 - Sept. 9
J female X J male	Sept. 15 - Oct. 30	Aug. 1 - Aug. 26
J female X K male	Sept. 12 - Oct. 25	Aug. 5 - Sept. 14

The table shows that the progeny of the Korean female crossed with the Japanese male emerges at approximately the same time as the Korean strain and 2 weeks later than the progeny of the Japanese female crossed with the Korean male. This would indicate that the F-1 generation emergence period of crosses between the Korean strain and Japanese form is determined by the parent female in both cases.

The effect of temperature upon the fungus Metarrhizium anisopliae.--In connection with studies of diseases affecting Japanese beetle larvae, S. R. Dutky, Moorestown, inoculated healthy third-instar larvae of the Japanese beetle with the fungus Metarrhizium anisopliae by dusting the larvae with spores of the fungus. The larvae were then placed in tightly stoppered glass vials and held at various constant temperatures, while undusted larvae held in vials at the same temperatures served as controls. Ten inoculated and ten untreated larvae were used for each temperature. The results of this test indicate that the temperature of holding has a definite effect upon the time of development of the disease, 50° F. being very nearly the minimum temperature at which parasitism by Metarrhizium anisopliae occurs.

Experiments with Trichogramma give negative results for codling moth control.--For several years the Division of Fruit Insects has been carrying on experiments to determine the practical value of the utilization of the egg parasite Trichogramma in the control of the codling moth (Carpocapsa pomonella L.). Experiments have been carried on at Cornelia, Ga., under the direction of Herbert Spencer, of the Albany, Ga., station, in cooperation with the Georgia State Entomologist's Office, with C. H. Alden of that agency in immediate charge. Experiments have been carried on also at Yakima, Wash., by E. J. Newcomer and M. A. Yothers. The parasites for the experiments were reared at the Albany, Ga., station. The experiments at Cornelia during the season of 1935 included 15 pairs of orchard plats, each colonized plat being compared with a similar one in the same orchard, but some distance from it. The average parasitization of codling moth eggs in the colonized plats was 42.9 percent and, for the uncolonized it was 31.1 percent. The percentage of clean fruit for the entire season averaged 43.9 for the colonized plats and 41.1 in the uncolonized plats. The differences, however, were not very consistent, ranging from 43.6 (arithmetical difference) in the positive direction to 27.5 in the opposite direction. The results at Yakima in the season of 1935 were quite similar, the infestation records showing an average of 69.6 percent of clean fruit for 9 colonized plats as against 60.8 percent for the check plats. Here again, however, the differences varied from 40.9 in favor of the parasite liberations to 13.4 in the negative direction. The results of neither of these experiments appear to be statistically significant, and differences of this size are not sufficient to offer a great deal of encouragement. A decision has therefore been reached to discontinue the work with the use of Trichogramma for codling moth control.

Tobacco shade cloth effective in the protection of drying pears from insect attack.--By comparing infestation in pears unprotected during drying with fruit covered with tobacco shade cloth during and for 5 days after drying on stacked trays, Heber C. Donohoe, of the Dried Fruit Insect Laboratory at Fresno, Calif., demonstrated marked advantage in the use of the cloth. The infestation was chiefly by the raisin moth, Ephestia figulilella Greg.; some larvae of the dried fruit moth, Vitula serratilineella Rag., were present. Covered pears averaged 1.8 percent infested, whereas 19.0 percent of the unprotected halves contained infestation. Previous tests of shade cloth protection of drying peaches, nectarines, apricots, figs, and raisins against the raisin moth have been successful.

MEXICAN FRUIT FLY CONTROL

Fruit flies continue to increase.--In the valley area all species of fruit flies found there previously were trapped in increased numbers during January. The total for this month over December for Anastrepha ludens jumped from 3 to 49; A. serpentina, 43 to 76; A. fraterculus, 9 to 15; A. sp. "Y", 7 to 30; A. pallens, 489 to 530; and Toxotrypana curvicauda, from 11 to 26. There were also trapped 2 specimens which were listed as probable new species. No larval infestations were found throughout the month. Fruit shipments for the season total 5,503 equivalent carloads to the end of January.

DATE SCALE CONTROL

Progress of work during January.--In January inspection was completed in the Coachella Valley, the principal date-growing area in the Southwest. No *Parlatoria* date scale has been found in the valley since November 1931. A final scouting of the valley to discover any unlisted palms was begun during the month and all previously infested properties are being checked for volunteer palms. In the Imperial Valley inspection was continued, and a number of small plantings were given their final inspection.

CEREAL AND FORAGE INSECT INVESTIGATIONS

White grubs develop rapidly under laboratory conditions.--T. R. Chamberlin, Lee Seaton, and Paul Ritcher, Madison, Wis., report that larvae of *Phyllophaga* spp. reared in the laboratory from eggs laid last July and August by beetles of identified species, together with larvae of the same age collected in the field, were reexamined during the month. Of 91 larvae hatched in the laboratory, 17 had changed from the second to the third, and 1 larva from the first to the second instar between the 1st and 21st of the month. Of 498 larvae collected in the field, 218 had changed from second to third instar between early in December and January 21. This rapid development under laboratory conditions is interesting because, with few exceptions, these larvae belong to species characterized in the locality of Madison, Wis., by a 3-year cycle, and species whose larvae in the field are now in the second instar.

Recirculation of gas in fumigation under vacuum increases efficiency in insect control.--R. T. Cotton, Manhattan, Kans., reports that experimental work on vacuum fumigation conducted at Cedar Rapids, Iowa, for the control of insects in stored cereals, revealed the interesting fact that uniform distribution of a fumigant is not obtained in a vacuum tank by the customary procedure. Instantaneous adsorption of the fumigant by the commodity on the outside of the load prevents the full concentration from reaching the interior of the load. It has been found that by using multiple gas entry points to the tank and by recirculating the fumigant, after its entry, with the aid of the vacuum pump and a by-pass system, the effective dosage can be reduced 25 percent. This represents a considerable saving in the cost of fumigation.

A dermestid beetle injuring seeds.--Mr. Cotton reports also that, although dermestid beetles have been generally considered to be chiefly feeders on animal products, it has been found that *Trogoderma* sp., probably *versicolor* Creutz., is one of the worst pests of stored seeds at Manhattan. This species was also found in a local tire repair shop breeding in large numbers in the compound used for vulcanizing damaged tires.

Second fall generation of hessian flies in 1935.--E. T. Jones, of Manhattan, states that an early November survey has indicated that a moderate, though potentially important, infestation in southeastern Kansas and southwestern Missouri has developed from second-brood hessian flies over an area where infestation by the first brood was comparatively light. The

larvae, indicated in the following summary, were from one half to full grown and subsequently developed into second-generation puparia.

Area	: Average: : plants: : infested:	Average: tillers: infested:	Average: total forms: in 100 plants:	: Average: total forms larvae
	: Percent:	Percent:	Number:	Percent
Southeastern Kansas-----	: 31	: 20	: 83	: 53
Southwestern Missouri----	: 29	: 13	: 75	: 66

F₄ selections of Marquillo x winter wheat hybrids show outstanding resistance to heavy infestations of hessian fly.--C. M. Packard, La Fayette, Ind., reports that in resistance tests at Springfield, Mo., out of 263 F₄ winter habit strains, from hybrids, involving a selection of Marquillo as resistant parent and Oro, Minturki, Tenmarq, and Kawvale as desirable winter parents, 20 strains with plant infestations ranging from 0 to 60 percent have shown comparatively high resistance and tolerance to heavy fall infestations of hessian fly. Of the entire group, 147 strains had a range of infestation of from 61 to 90 percent and were decidedly more resistant than their winter wheat parental checks. In the remaining 96 strains, a higher degree of tolerance was indicated than was shown by their parental strains, namely, Oro, Minturki, Tenmarq, and Kawvale. The range of infestation in the F₄ strains was 91 to 100 percent and that of their parental strains was from 97 to 100 percent.

An ortalid fly pest of green corn found in Puerto Rico.--F. M. Vandenberg, of the Mayaguez, P. R., laboratory, reports that in the investigations of the insects affecting corn recently undertaken in Puerto Rico, the work of a dipterous maggot was observed in ears of green corn grown for roasting purposes. This maggot has been identified as the young of a fly, Euxesta stigmatias Loew, belonging to the family Ortalidae of the Diptera. A closely allied species in this country is well known as a scavenger. The Puerto Rican species, however, has been reared on fresh green corn from egg to adult. Although the known distribution of this fly indicates a more or less tropical habitat, it is believed that it might become of economic importance should it gain a foothold in the Gulf States.

JAPANESE BEETLE CONTROL

Hunch results in discovery of irregular shipment.--When a Brooklyn, N. Y., greenhouse establishment, after having been refused Japanese beetle certification for 44 large palms from an uncertified greenhouse, made no further attempt to obtain certified stock to fill this valued order from Miami, Fla., H. L. Smith, district supervisor, became suspicious. Upon visiting the piers in New York City on January 11, Mr. Smith found such a consignment of palms destined to Miami under the tags of one of the New York City plant brokers. An immediate investigation disclosed that the greenhouse-men had arranged with a class I broker who had a supply of certificates to

turn the shipment over to the broker so that it might be shipped in the latter's name and under their certificate. Since the plants had been placed aboard ship and could not be unloaded without delaying the vessel's departure, arrangements were made for the plants to be brought back on the return trip. The certification privileges of the shipper were immediately withdrawn and papers were filed with the United States Attorney in New York City on January 24 alleging that the broker had violated the Plant Quarantine Act.

Illinois will treat Japanese beetle infestation.--Advices have been received from L. A. Moore, Superintendent of the Division of Plant Industry, Illinois State Department of Agriculture, that Illinois will follow recommendations of the Bureau as to soil treatment in the infested areas in Chicago. An attempt will be made by the State to put this through as a W. P. A. project, with possible assistance from the Chicago Park Board.

Dismantled colonial house inspected.--Inspection was made by the district inspector at Framingham, Mass., of an old colonial house at Henry Ford's Inn property at Sudbury. The entire dismantled frame of hand-hewn oak and the doors and windows were loaded into a freight car for shipment to the Ford village at Dearborn, Mich. Inspection was also made of old bricks that had been taken from the fireplace and piled in the yard.

Decrease in Christmas-tree inspections.--Final tabulation of the records of 1935 Christmas-tree inspection indicates that 590,105 trees originating in the lightly infested gypsy moth regulated area were examined and certified for shipment to nonregulated points. This represents a 34-percent decrease in the number of trees inspected in the same area during the 1934 inspection season, when 905,004 trees were inspected and certified.

Current Dutch elm disease activities.--Accomplishments in Dutch elm disease eradication activities for the month of January included the removal of 92 confirmed trees and 119,550 dead and dying trees. During the month 86 elms were confirmed as diseased and 87,304 dead and dying trees were tagged for later removal by sanitation crews. The grand total of trees of all types removed is now 1,155,666. At the end of the month there were in the field 2,321 W. P. A. men, 56 appointees, 7 per diem workers, 1,154 C. C. enrollees, and 43 State employees. Only 3 confirmed trees remained standing at the end of the month.

New Jersey infected zone extended.--Confirmation was received covering a 12-inch elm located in White Township, Warren County, N. J. This confirmation was the result of investigations carried on by the Morristown, N. J., laboratory in conjunction with scouts furnished from the New Jersey eradication force. The diseased specimen was found among samples collected in a swamp along the Pequest River. This new infection increases the New Jersey infected zone by 44.78 square miles, and extends the protective zone farther into Pennsylvania. The New Jersey infected zone now includes 2,529 square miles, and the protective zone measures 1,091 square miles.

Additional diseased elms discovered in Cleveland.--Recent confirmation of 16 diseased elms in Cleveland, Ohio, extended the infected zone in that section about 1 mile into Lake County. In view of the finding of the large number of confirmed trees and the fact that the infection is localized, the sanitation program there was broadened to include as much of the dead and devitalized material as possible, since it is in such material that the disease seems to exist. At the end of January there were only 2 standing confirmed trees in the Cleveland infected zone.

W. P. A. quotas unfilled.--Of 175 men requisitioned during December in New York State, only 53 men reported for work. The relief rolls prior to November 1 in upper Westchester, Rockland, and Orange Counties have been exhausted. Putnam County has furnished 31 of 50 laborers requested, with the possibility that the quota will eventually be filled.

Eight-hour day for Dutch elm disease crews.--Beginning January 2, W. P. A. workers engaged in Dutch elm disease eradication and sanitation went on an 8-hour day basis, replacing the 6½-hour day. The men continued on the 5-day week, but work only 16 days a month for a total of 128 hours. This will permit more work per day with less travel and closer supervision.

FOREST INSECT INVESTIGATIONS

Bark beetles not a serious factor in thinning of young-growth pine stands in California.--Many of the overcrowded stands of second-growth pine in California were thinned by the Forest Service as a part of the N. I. R. A. relief program in 1934. The bark-beetle infestations developing in the slash created by these thinnings were considered a possible threat to reserve trees left after cutting, and the Berkeley field laboratory was requested to study this aspect of the operation. K. A. Salman, Berkeley, has recently completed the final report which summarizes conditions found on the thinning areas during 1934 and 1935. Most of the slash was attacked by bark beetles, except the very small trees below the diameter susceptible to attack. For the most part, broods resulting from these attacks were not very successful. Such losses as did occur in standing trees appeared to result from attraction of beetles to the areas soon after the thinning took place and not from beetles that bred in and emerged from the slash. So far as the results of the 1934 thinning operations can be interpreted, the hazard from bark beetles to reserve trees is negligible in stands of reproduction and small poles. Some hazard does appear to be created where large poles and small trees are cut, particularly where these are cut among groups of trees of similar or larger dimensions. It is conceivable, however, that similar work carried on under different climatic or stand conditions might result in outbreaks that would have a serious effect on the reserve stand.

Cold hardiness of mountain pine beetle increases in fall and winter.--J. M. Miller, of the Berkeley laboratory, reports that experiments to determine resistance to low winter temperatures by the mountain pine beetle

during the fall of 1935 have shown that hardiness increases with the advance of cold weather. The material used as a basis for these experiments was concentrated in infested logs at a point in the Sierra Nevada Mountains near Wawona, Calif., where the broods were allowed to go into the overwintering stage under the natural conditions of forest environment. Three important host trees, sugar pine, lodgepole pine, and ponderosa pine, were represented in this material. At intervals during the fall and winter, sample logs were transported to the Berkeley laboratory, where immediate tests were made for cold hardiness of the broods. Resistance of larvae was found to be consistently lower in sugar pine than in ponderosa and lodgepole pine. An increase in cold hardiness was evident as the overwintering condition of the broods became established. This is best illustrated by the material from lodgepole pine. The first sample was tested on October 15, while the larvae were still in the active feeding stage. At that time a temperature of 7° F. was sufficiently low to kill 100 percent of the larvae. Two months later, on December 11, all larvae were not killed until a temperature of $-2\frac{1}{2}^{\circ}$ had been reached. On January 12 samples of the same material brought in from the field required a temperature of $-12\frac{1}{2}^{\circ}$ to cause complete mortality. This same increase of cold resistance was produced in the laboratory by long exposure of the larvae to temperatures just above the freezing point. Material brought in from the field on October 15 and kept in cold storage at 36° for 7 weeks increased in resistance from a killing point of $7\frac{1}{2}^{\circ}$ to -5° . This is similar to the increased resistance built up in the field during the same time interval.

Black Hills beetle outbreak successfully controlled.--J. A. Beal, of the Fort Collins, Colo., laboratory, reports that the heavy and widespread infestation of the Black Hills beetle, which has increased to epidemic proportions during the past 3 or 4 years in the ponderosa pine stands of the Uncompahgre and Montezuma National Forests in southern Colorado, has been brought under control by the aggressive campaign of the Forest Service, using C. C. C. labor. The entire Uncompahgre forest was covered by control work during 1933 and 1934 and much of it was recleaned during 1935. A reduction of 95 percent in the number of infested trees has been obtained on this forest. At present the entire Montezuma forest has been covered during control operations. Light infestations on one unit where recleaning has been done indicated that here too control had been very successful, showing a 95-percent reduction in the number of infested trees. In some units the number of infested trees has decreased from an average of 90 per section to as low as 4 or 5 per section this year.

Termites damage southern shelterbelt nurseries.--Dr. Beal also reports that termites of the species Reticulitermes tibialis Bks. have done a great deal of damage during the past summer to nurseries in Oklahoma and Texas. This damage was peculiar in that it was not associated with buried wood or seedbed frames, but occurred on the roots of seedling hardwood trees, in cultivated rows, often where the soil appeared to be almost free from rotting vegetation. Damage has been most severe to green ash, mulberry, hackberry, and honey locust seedlings, although almost no species showed immunity. In some nurseries it is estimated that losses during the growing

season ran as high as 25 percent. Preliminary experiments on control of termites in nurseries indicated that paradichlorobenzene crystals at the rate of $3\frac{1}{2}$ pounds per 100 square feet of soil, worked into the soil from 2 to 3 inches, successfully controlled the termites.

Laboratory work on European spruce sawfly continues.--H. J. MacAloney, of the New Haven, Conn., laboratory, reports that European spruce sawfly larvae, reared during December on a caged tree in the laboratory, spun cocoons from January 6 to 16. Adults emerged in January, the last ones issuing on the 29th. No oviposition has been observed.

Notes on forest-insect parasite work in New England.--P. B. Dowden, of the New Haven, Conn., laboratory, reports that, as in 1934, parasitization of the imported willow leaf beetle (Plagiodera versicolora Laich.) by Schizonotus sieboldi Ratz. remained high. It ranged from 15 to 80 percent. Mr. Dowden also reports that about 8,000 larch sawfly cocoons from Montana and points in Michigan and Wisconsin were isolated for parasite emergence and that on January 6 a shipment of 52,000 adults of the elm leaf beetle was received from H. L. Parker, Hyeres, France. It is hoped that the tachinid parasite Anachaetopsis nitidula Rond. will be obtained from this material next spring.

GYPSY MOTH AND BROWN-TAIL MOTH CONTROL

Moth control personnel.--Up to January 15, under the W. P. A. projects, the following number of workers were employed under gypsy moth projects in the different States, as follows: Maine, 178; New Hampshire, 95; Vermont, 559; Massachusetts, 612; Rhode Island, 68; Connecticut, 632; New York, 169; New Jersey, 71; and Pennsylvania, 908; total, 3,292. On the same date, under the W. P. A. emergency project, the number employed on brown-tail moth work was as follows: Maine, 397; New Hampshire, 473; Massachusetts, 527; Rhode Island, 7; Connecticut, 16; total, 1,420. During the first week in January an average of 2,006 men from C. C. C. camps were employed on gypsy moth work in the area east of the barrier zone. They were assigned as follows: New Hampshire, 114; Vermont, 619; Massachusetts, 682; Connecticut, 591. The last week in December it was understood that one C. C. C. camp in Connecticut was to be abandoned. This was strictly a gypsy moth camp. The State Forester of Connecticut has arranged for the transfer of several gypsy moth foremen, in order to improve the gypsy moth organization in the Connecticut camps. In Massachusetts it was understood that four camps would be abandoned, in which gypsy moth work has been supervised from this office, three of these being Department of Interior camps, and the other a Forest camp. It appears that in New Hampshire no camps will be abandoned, and it is understood that in Vermont only one camp, which effects gypsy moth work, would be discontinued. Unfortunately, this is the camp at Bellows Falls, which is the most important from a gypsy moth standpoint of any of the camps east of the zone in Vermont. In Massachusetts the Commissioner of Conservation has designated the State district man, in the western part of the State, as State inspector of the four purely gypsy moth camps in Massachusetts. It is felt that this will be helpful to the

project, as this official is thoroughly familiar with the gypsy moth work and has always cooperated with this office. Under the brown-tail moth project in Maine most of the time is now being spent in scouting the towns carefully and cutting all of the brown-tail winter webs, and some cutting of worthless apple and wild-cherry trees is being done. In New Hampshire all time is being spent in cutting winter webs. In Massachusetts both cutting out of worthless favored food plants and cutting of winter webs is being done. In Rhode Island all time has been spent in cutting of worthless favored foods, but this is to be discontinued and the time will be used in scouting for winter webs. In Connecticut all time has been spent in scouting for winter webs. The numbers of brown-tail webs cut up to the middle of January were as follows: Maine, 264,377; New Hampshire, 336,243; Massachusetts, 294,055. The numbers of trees cut--these being mostly large wild cherry and old apple trees--were as follows: Maine, 32,964; New Hampshire, 36,438; Massachusetts, 139,160; and Rhode Island, 574.

PLANT DISEASE CONTROL

Ribes-eradication work in sugar pine region, summary for 1935.--Over 15,000,000 Ribes bushes were destroyed in 1935 in the sugar pine States (California and Oregon) in connection with the blister rust control project in that region. Of this number 12,564,532 bushes were eradicated in California on 74,194 acres with 43,321 man-days of labor, while in Oregon 2,448,659 bushes were destroyed on 15,915 acres with 9,572 man-days of labor. This work included both initial eradication and reeradication, 85,158 acres being initially worked and 7,951 acres reworked.

Pine infections in the Inland Empire.--The number of known locations of centers of pine infection in the Inland Empire as of December 1935 totaled 203, an increase of 79 over the number known at the end of 1934. Of this total, 15 are centers that originated in 1923. No new centers of this age were found in 1935.

Blister rust control activities in the North Central States.--Approximately 500 W. P. A. laborers were used in December on blister rust control work in the North Central States, most of these being engaged on preeradication survey work. A limited amount of local Ribes-eradication work was performed in Michigan, 49,617 bushes being destroyed on 3,713 acres with 643 man-days of labor. The eradication of the European or cultivated black currants had to be curtailed where the depth of the frost in the ground prevented their removal and the deep snow in some of the northern counties made it impossible to locate the plants. During the month 113,063 inspections were made for cultivated black currants and 5,850 bushes were destroyed. A blister rust canker on white pine was found in Benzie County, Mich., the first finding of blister rust on white pine in that county.

New blister rust infection areas located in New York.--District leader Nichols of Essex County, N. Y., reports that during the early part of January several badly infected white pine areas were discovered by W. P. A. employees

engaged in preeradication-survey work. These infection areas are located on the slopes of Jug, Little Far, and Old Far Mountains in North Hudson Township. Heavy infection and severe damage was noted on pines of all sizes, including many large trees.

Supervisory positions transferred to Civil Service.--During the past 6 months the regular administrative positions in the field service of the white pine blister rust control and barberry eradication projects have largely been placed under the competitive Civil Service. Formerly most of the personnel on these cooperative projects had been appointed as agents and, as such, were not entitled to the benefits of the Retirement Act. Civil Service registers for the positions of Pathologist, Associate Pathologist, Assistant Pathologist, and Chief Scientific Aid were established as the result of Civil Service examinations held in April 1935, and since this date 59 agent positions in the field service on the blister rust control project and 16 on barberry eradication have been placed under Civil Service. Registers are also available from which temporary appointments to the position of Scientific Aid can be made.

COTTON INSECT INVESTIGATIONS

Distribution of overwintering pink bollworms.--Additional information on the distribution of the overwintering larvae of the pink bollworm in the fields of the Big Bend of Texas, has been reported by A. J. Chapman, H. S. Cavitt, and M. H. Hughes, of the Presidio, Tex., laboratory. The results of the soil examinations, reported last month, showed from 1.4 to 43.6, or an average of 12.61 larvae per square yard, in the soil. The larvae hibernating above ground have now been reported on. Examination of plant material remaining on the plants and on the surface of the soil after the final picking was made in 25 fields. From 1.0 to 141.4, or an average of 42.9 larvae per square yard, were found hibernating above ground this fall. The proportion of total pink bollworms found above ground this year was 22.6 percent, as compared to 8.0 percent in 1934, 13.8 percent in 1933, and 7.7 percent in 1932. The mean temperature during September and October 1935 was several degrees lower than in 1933 and 1934 and is thought to have been a factor in the larger number of larvae hibernating in the ground this season. Following the field clean-up the remaining surface trash was again examined from 100 square yards in each of 9 fields. These examinations showed an average of 2.74 larvae per square yard in the surface trash remaining after the clean-up. The thoroughness of the clean-up was shown by a reduction of 35 to 91 percent in the surface-trash population, the only larvae that could be reached by the clean-up.

Soil insects injuring cotton in Arizona.--L. D. Christenson, Buckeye, Ariz., has summarized last season's work as follows: "During the summer of 1935, a survey of soil insects affecting irrigated cotton was undertaken in Arizona. Most of the soils characteristic of the area on which cotton is grown are loams or sandy loams. A number of insects were found to be damaging cotton roots. Early in the season a cutworm, Feltia malefida Gn., caused severe losses in the vicinity of Safford, necessitating replanting of cotton. A wireworm, Conoderus sp., damaged seedlings over widespread

areas. For the most part, its attack was not sufficiently concentrated to seriously affect production, but one area was noted in which the injuries by this insect were so pronounced as to thin the stand appreciably. The burrowing bug (Pangaeus discrepans Uhl.) was present in almost all fields sampled, nymphs and adults alike feeding on cotton roots. A test indicates that their detrimental effect, in population densities noted, is of no significance so long as plants have plenty of water. Cotton plants in Arizona are abundantly supplied with water (4 to 5 acre-feet per season) as a crazy-top control measure. P. discrepans was more abundant in sandy soils than in loams and clay. A small scarabaeid, Ataenius hirsutus Horn., was exceptionally abundant in cotton fields at Sacaton. A maximum concentration of approximately 10,000,000 per acre was recorded. Field tests and cage observations showed that the adult beetles consume cotton roots. Under all circumstances, however, the adults were extremely sluggish and ate but little. Another small beetle, Psammobius sp., was very abundant over the entire area. This insect was found to be most numerous in the compact soil just below the plow line. Cage tests have shown that Psammobius sp. may consume cotton roots sparingly. A cicada, Diceroprocta apache Davis, was present in cotton-field soils everywhere. This species preferred to breed up in desert areas and grass lands, however, the population in cotton being small. The adults did some damage to cotton by ovipositing in fruit-bearing branches. Another beetle which has been reported as damaging cotton roots in the past, Blapstinus sp., was frequently encountered but no instance of severe injury was noted. The field cricket (Gryllus assimilis var. pennsylvanicus Fab.) was present in all fields. This cricket was especially abundant in the Yuma section. Smaller soil animals were present in all fields. At Sacaton their average seasonal population density was 65,400,000 per acre or 0.86 per cubic inch of soil at depths up to 12 inches. At Buckeye their average seasonal population density was 10,300,000 per acre, or .137 per cubic inch of soil, at the same depths. Several of the smaller soil animals were found in cage tests to feed upon cotton roots, making gouges and pits, or pruning off root hairs. Two collembolans, Pseudosniella violenta Fols., and an unidentified entomobryid, were responsible for much pitting. Other Collembola and a japygid were responsible for pruning root hairs. A small unidentified coleopterous larva also proved to be a root feeder. Injury to the cotton root system by all of these insects was for the most part confined to the relatively porous soil above the plow line, the tiny rootlets suffering most. Plants were not noticeably affected, appearing very vigorous at all times as a result of frequent irrigations. Symphylids, Protura, and Campodeidae were not found in cotton-field soils of Arizona. In studies made by the writer in Louisiana, Texas, California, and Arizona, this is the first locality in which these small organisms have been entirely absent."

PINK BOLLWORM AND THURBERIA WEEVIL CONTROL

Field clean-up completed in the Big Bend of Texas.--The cleaning of cotton fields was completed in the Big Bend area of Texas on January 23, a total of 2,262 acres having been cleaned. The work consisted of first cutting the stalks with machetes, picking up by hand the material shattered during

the cutting, and then burning all of it. Especially constructed rakes were used instead of hand-picking, and proved to be much more economical and efficient. All of the cotton in this area is grown under irrigation, water being obtained from the Rio Grande. The Conchos River flows into the Rio Grande from Mexico about 2 miles above Presidio. Approximately 90 percent of the cotton is produced below the mouth of the Conchos, owing to the water supply, and the most pink bollworms occur in this section. All of the fields in this area were cleaned, also all of the fields above the mouth of the Conchos, where the worm population would justify.

Wild cotton eradication.--The eradication of wild cotton in southern Florida has continued to go forward very satisfactorily. Larger crews than usual are being used this season, which is of particular advantage as many additional sections have been thoroughly gone over for wild cotton, whereas the smaller crews heretofore used did not have time to go over the entire area in which they were working. The larger crews are made possible by the fact that work is being carried on this year with W. P. A. funds, with the exception of the work at Cape Sable. Cape Sable is rather isolated, the laborers have to live in camp, and it was impossible to obtain enough men to carry on the work; therefore this section was dropped for the time being from the W. P. A. list and work is being carried on with Bureau funds. During the month a first clean-up was completed on approximately 348 acres, from which 38,695 mature and 6,169 seedling plants were removed. Along the west coast only 6½ acres of virgin cotton, containing less than 500 mature plants, was located in areas previously worked. The location of the remaining cotton, removed during the first clean-up, has been known for some time, but it has heretofore been impracticable to clean it. A recleaning was made on some 7,500 acres, from which only 290 mature plants, previously missed, were removed, in addition to 206,617 seedling and 7,057 sprout plants.

Thurberia plant eradication.--The work has continued to progress satisfactorily during the month and is being carried on with W. P. A. funds. All of the work so far has been in the Tortillita Mountains and will be completed by the middle of the month. It was thought that it would be finished by the end of January, but some time was lost on account of weather conditions. This range is being worked first because it is the one nearest to cultivated cotton in the Santa Cruz and Gila Valleys. When it is completed work will be begun in the Santa Catalina Mountains, as this range is next nearest to cultivated cotton. This latter range is much rougher than the Tortillitas and arrangements have been made with the local W. P. A. officials whereby laborers who are too old or who have a physical disability that will prevent them from working in rougher areas are to be transferred to other projects and replaced by younger and abler men.

TRUCK CROP AND GARDEN INSECT INVESTIGATIONS

Tomato pinworm and potato tuber worm in tomatoes in California.--J. C. Elmore, of the Alhambra, Calif., laboratory, reports that field observations during October, November, and December 1935, have disclosed that the tomato

pinworm (Gnorimoschema lycopersicella Busck) can be considered a serious pest of tomatoes only in that part of California extending from Ventura County southward, although it occurs on wild host plants in Santa Cruz and Marin Counties. The surveys also revealed that the potato tuber worm (Gnorimoschema operculella Zell.), which is associated usually with the tomato pinworm in some parts of California, occurs extensively in tomatoes in Santa Barbara and San Luis Obispo Counties, where it has been mistaken commonly for the tomato pinworm. Normal development of the pinworm at a retarded rate, including oviposition, continued throughout December and a decided increase occurred in the population of the pinworm in winter tomato fields. The precipitation was low, being 2.5 inches below normal.

Recovery of European earwig parasite in Washington.--C. W. Getzen-daner, of the Puyallup, Wash., laboratory, reports that puparia or adults of the European earwig parasite Digonichaeta setipennis Fab. were recovered during 1935 in 8 widely separated localities in the State of Washington. A total of 2,236 parasite adults and puparia, plus 10,000 parasitized hosts, have been liberated in 17 colonies distributed in Washington and Idaho. A total of 125 parasites were recovered from the 8 localities involved.

Tolerance of tuberose bulbs to hot-water treatment for bulb mite and root-knot nematode control.--As the result of tests at Magnolia, N. C., with hot-water treatment against the bulb mite (Rhizoglyphus hyacinthi Boisd.) and incidentally the root-knot nematode (Heterodera marioni (Cornu)) on tuberose, C. A. Weigel and R. H. Nelson, of the Beltsville, Md., laboratory, report that dormant tuberose bulbs of planting size were not affected adversely when subjected to the hot-water treatment at temperatures of 110° F. for 1 hour, or at 118° to 120° for 1/2 hour. The results indicate also that the application of the treatments on a commercial scale is practical. The best results were obtained when the treated tuberoses were planted on either newly cleared land or on soil that had been in cultivation but on which tuberoses had not been grown the previous season, indicating that tuberoses should not be planted in succession in the same field. The bulb mite was killed by the hot-water treatment at all of the above-mentioned temperatures and durations of time, and the root-knot nematode succumbed at the two higher temperatures mentioned.

Effect of time of planting peas on pea weevil infestation.--In summarizing the results obtained from nine plantings of Alaska peas at Moscow, Idaho, made from April 11 to June 28, 1935, T. A. Brindley, of the Moscow laboratory, reports that infestation by the pea weevil in the peas harvested from these various plantings ranged from a maximum of 80.9 percent in the second planting, made on April 30, to a minimum of 11.6 percent in the peas harvested from the last planting, made on June 28. The number of peas produced decreased rapidly after the second planting and the weight of the peas decreased steadily from the first to the last planting. The data indicate that it is not profitable, in the Moscow locality at least, to delay the planting of Alaska peas in order to reduce weevil damage.

Corn earworms and cutworms on cabbage complicate control of cabbage worms.--In reporting on the results of experiments against various species of cabbage worms at Charleston, S. C., during the fall of 1935, W. J. Reid says that the corn earworm (Heliothis obsoleta Fab.) and several species of cutworms were more abundant and caused more damage to cabbage foliage than did the common species of cabbage worms usually more prevalent, i. e., the imported cabbage worm, the cabbage looper, and the larva of the diamond-back moth. The data obtained from the experiments indicated that the strengths of derris-dust mixtures or pyrethrum-dust mixtures recommended for the common species of cabbage worms were not effective in controlling the larvae of the corn earworm or the cutworms, but that dust applications of paris green, calcium arsenate, or synthetic cryolite before the plants began to head were effective against H. obsoleta and proved satisfactory when used in conjunction with a standard cutworm poisoned bait when both pests were present in destructive numbers.

Biometrical analyses improve efficiency of cabbage worm studies.--Recent studies of data obtained by W. J. Reid, Charleston, and analyzed by L. B. Reed, of the Chadbourn, N. C., laboratory, in connection with insecticide tests against 3 common species of cabbage worms in South Carolina, indicate that in any given field the number of cabbage worms present on the marketed part of the plant (the head plus four loose wrapper leaves) was proportional to the number of worms on the entire plant and to the number present on the unmarketable portion of each cabbage plant; also that the insecticides were equally as toxic to the worms on the unmarketable part as to those on the marketed part of the plant. These results are important as indicating that census determinations of the cabbage worms present only on the marketed part of cabbage afford significant data comparable to that obtained by making records of the worm population on the entire plant. The determination of these facts will make it possible for the field workers on this project to obtain significant data on the effect of insecticide treatments with a minimum expenditure of time.

Relation between soil-moisture content and wireworm mortality in Pacific Northwest.--E. W. Jones, of the Walla Walla, Wash., laboratory, reports that in the course of experimental field investigations to determine the effectiveness of soil desiccation on the survival of wireworm populations, laboratory tests have indicated that 100 percent of the Pacific coast wireworm (Pheletes californicus Lec.) present, were killed in 48 hours of exposure at 63° F. in sandy loam and in loam soils in the presence of a soil-water content ranging from 17 to 20 percent of the moisture equivalent (2.9 to 3.5 percent dry-weight basis). These tests also disclosed a significant difference in the resistance of the wireworm species P. canus and P. californicus to the drying effect of the soil, P. californicus proving to be the more drought-resistant of the two.

Susceptible host plants of cabbage webworm.--In summarizing the results of biological studies of the cabbage webworm at Chadbourn, N. C., W. A. Thomas reports that during 1935 this insect was found feeding on various types of Crucifera and on beets. The order of susceptibility of these host plants to larval attack, when grown in close proximity to each

other, was approximately as follows: Cabbage, collards, broccoli (heading), mustard, turnips (rough), beets, and rutabagas. The insect was not found on any native host plants in the Chadbourn area in 1935.

INSECTS AFFECTING MAN AND ANIMALS

Blowfly parasite may overwinter as adult.--H. E. Parish, of the Menard, Tex., laboratory, reports that in collecting hibernating insects in that locality during January, an adult Brachymeria fonscolombei Duf., one of the hymenopterous pupal parasites of blowflies, was found underneath the bark of a dead pecan tree. This finding gives some indication that this parasite may overwinter in the adult stage.

Note on longevity of winter tick larvae.--At Sonora, Tex., O. G. Babcock has observed that a number of larvae of Dermacentor nigrolineatus Pack. were still alive after a period of 202 days without feeding.

Winter activity of screw worm.--A. W. Lindquist, of the Bureau's laboratory at Uvalde, Tex., reports as follows: "A minor outbreak of Cochliomyia americana C. and P. occurred in Uvalde County in January. The cause of most of the trouble was docking sheep, although other types of wounds also became infested. The weather apparently was ideal for screw worm attack, being characterized by hot days above average and cool nights below average. Most of the ranchmen reported more or less screw worm trouble. One man had 26 cases in 100 docked sheep. Five collections from these showed C. americana, and probably all cases were of this species. A ranchman near Rio Frio reported that of 41 docked sheep, 25 were lost because of screw worm attack. Some of the cases observed were very bad, harboring from 1,000 to 2,000 C. americana larvae and many eggs. Of especial interest is the fact that most ranchmen neglected to examine and treat their stock and consequently tens of thousands of C. americana larvae dropped during January. If a fair percentage of these should go through until March we could expect a high population of C. americana with the advent of spring. Because of the below-normal temperatures from January 19 on, it is probable that most of the pupae will perish. Collections of maggots from wounds have been made from 16 cases from January 10 to 29 and C. americana were found in all. Phormia sp. was present in 8 of the cases. In view of the fact that diligent search for screw worm cases failed to reveal any C. americana infestation from November 15 to January 10, and the absence of good blowfly temperatures during this period, it is concluded that the large numbers of C. americana present in January (both in trap and collections) represented emergences from larvae dropped before November 15. This indicates a "carry over" period of about 64 days, with a daily mean air temperature of 54.3° F." At Sonora and Menard, Tex., about 150 miles north of Uvalde County and at a considerably higher elevation, no screw worm cases were observed in January. All cases of myiasis recorded were caused by Phormia sp. At the screw worm research laboratory, Valdosta, Ga., E. F. Knipling and B. Y. Travis have made the following observations: "No C. americana oviposited on

experimental animals from December 11 to January 15. On January 16 a mass of C. americana eggs was oviposited on the shoulder wound of a sheep, and on January 18 a mass was deposited on the shoulder wound of a goat. In addition to these two masses, one mass of C. americana was oviposited on January 14 on the wound of a sheep infested with Phormia, and another mass on an infested wound of another sheep on January 13. No egg masses of C. americana were oviposited on the wounded animals from January 4 to 13. According to observations during October and up to December 10, the temperatures ranged high enough for C. americana to be active on practically every day during this time, especially on January 6, 7, and 8, when the maximum daily temperatures were 75°, 77°, and 78°, respectively. We offer the following explanation for this: It is probable that the rather low temperatures from December 16 to 23 (especially on December 27 when the minimum temperature recorded was 20°) killed the adults in nature. Those emerging after this period were not subjected to severe cold and no doubt survived. The fact that no eggs were oviposited during warm days such as on January 6, 7, and 8, may be due to the fact that the flies had not passed through the preoviposition period. Although the number of egg masses noted on the experimental animals is small, this at least shows that C. americana may become active at intervals during the winter months in this vicinity."

FOREIGN PLANT QUARANTINES

Entomological interceptions of interest.--Five living larvae and three puparia of the Mediterranean fruit fly (Ceratitidis capitata Wied.) were intercepted at New York on November 12, 1935. The specimens were taken out of 3 pounds of grapes in a dish in the captain's quarters on board a ship from Spain. Eggs and nymphs of the citrus blackfly (Aleurocanthus woglumi Ashby) and the cloudy-winged whitefly (Dialeurodes citrifolii (Morg.)) were intercepted at Miami, Fla., on November 11, 1935, on leaves of lime in cargo from Cuba. Living specimens of the scale insect Lepidosaphes kamakurensis Kuw. were found at Seattle, Wash., on April 4, 1935, on a camellia leaf in cargo from Japan. Living adults of the bruchid Bruchus affinis Froelich were taken at Washington, D. C., on November 7, 1934, in seed of Lathyrus tuberosus in the express from Issyk Kul, Union of Soviet Socialist Republics. Living specimens of the tettigoniid Hexacentrus unicolor Serv. arrived at Honolulu, Hawaii, on September 19, 1935, as pets in a cage in baggage from Japan. A living adult of the weevil Phelypera distigma Boh. was found at New Orleans on November 5, 1935, with banana debris in cargo from Mexico. The scale insect Lepidosaphes uniloba Kuw. was intercepted at San Francisco on September 26 and October 10, 1935, on Alyxia olivaeformis in baggage from Hawaii. Living specimens of the aphid Trifidaphis phaseoli (Pass.) were collected on October 11, 1935, on lima beans in the field at Cidra, P. R. Two larvae of the weevil Centorhynchus ericae Gyll. were taken at Philadelphia on August 30, 1935, on heather in the mail from Germany. This represents the first record in our files of this species being intercepted from Germany. The scale insect Chrysomphalus rhizophorae Ckll. was taken at Boston on June 29, 1934, on a lime in cargo from Dominica. A living

specimen of Sericothrips stanhylinus Haliday was intercepted at New York on December 17, 1935, in soil around the roots of holly in the mail from England. This is the first record in our files of this thrips being intercepted.

Pathological interceptions of interest.--Sclerotia and associated yellowish heads of an Aspergillus intercepted at New York September 18, 1935, seemed characteristic of A. alliaceus Thom. and Church. As this fungus was not known to attack any bulbs other than onion and garlic the material was referred to the Bureau of Plant Industry. Verification of the determination has now been received. Bacterium maculicola (McC.) McCulloch was intercepted from Spain for the first time on December 31 at Baltimore on cabbage. Bacterial spots apparently due to Bacterium vesicatorium Doidge were intercepted at El Paso on January 27 on husk tomato from Mexico and at New York on January 31 on eggplant from Trinidad, the spots being on the calyx in both cases and the first interception of the disease for both hosts. Cladosporium fulvum Cke. was intercepted on husk tomato for the first time on January 24 at El Paso in baggage from Mexico. Our first interception of Colletotrichum omnivorum Hals. from Sweden was made on January 20 at New York on Aspidistra. Our first interception of a disease on regal lily was made on leaves and stems from Mexico on January 25 at El Paso, the fungus being Colletotrichum sp. (or Vermicularia sp.) and apparently responsible for serious lesions on the host. A bamboo flower pot from Jamaica intercepted at New York on October 30, 1935, bore three fungi, Coniosporium shiraianum (Syd.) Bub. (first interception from Jamaica), C. bambusae (Thum. and Bolle) Sacc. (first interception), and Microdiplodia sp. differing from any species reported on the host. An interception of Heterosporium allii Campanile on January 16 at Baltimore enabled us to add Sweden to the countries from which this fungus has been intercepted on garlic. Heterosporium allii Ellis and Mart. was intercepted from Germany for the first time on January 5 at Philadelphia on leeks. A diseased croton leaf from Japan intercepted on January 10 at New Orleans was infected with what appeared to be Laestadia minuscula (Lev.) Sacc., a disease reported as occurring in Java. The material was scarcely mature and was inadequate for study. Mycosphaerella sp. was intercepted at El Paso on January 25 on Pteris tremula leaves from Mexico, apparently responsible for the death of numerous leaflets. Seymour lists no species of Mycosphaerella on ferns of this genus. Our first interception of Phoma lingam (Tode) Desm. from Asia was made at Seattle on January 8 in cabbage from China. Ramularia lamp-sanae (Desm.) Sacc. was intercepted for the first time on January 17 at New York in escarole leaves from England. Rhabditis strongyloides Schneider, of interest to nematologists, was intercepted on January 17, 1935, in turnips from England and was finally identified recently. Sclerotium ovuntiarum Speg. was intercepted for the first time on October 24, 1935, at the Inspection House, Washington, D. C., in Pilocereus from Argentina. Sclerotium oryzae Catt. was intercepted from Argentina for the first time on January 6 at New York in rice straw in mail. Sclerotium sp. was found in a California Erythronium bulb offered for export from New York, Sclerotium sp. was intercepted at New York on a narcissus bulb from England, and Sclerotium sp. was intercepted at the same port in snowdrop bulbs from Turkey. None of these fit species of Sclerotium known to occur on the hosts. An immature ascov-cete, apparently Venturia furcata Fautr., was intercepted September 24, 1935,

at New York on juniper berries from Italy. Fusicladium spots on quinces from Japan, intercepted at Seattle on December 10, appeared to be those of Venturia pyrina Aderh., our first interception of scab on quince. Vermicularia herbarum West was intercepted on October 23, 1935, at New York on carnations from Portugal. The only previous interception was from France in 1923.

Forbidden fruit.--During baggage inspection of passengers from a single boat in New York recently contraband fruit was found in baggage of 3 passengers from the Azores, 4 from Portugal; 4 from Greece, and 3 from Italy. From Italy there were oranges, tangerines, and pomegranates; from the Azores, oranges, apples, sweet limes, pears, and tangerines; from Portugal, apples, oranges, and sweet limes; from Greece, pears, pomegranates, oranges, and quinces. Mediterranean fruit fly was found in fruit from Greece only. Examination of stores in the same vessel resulted in finding that 130 grapefruit from Sicily were 30 percent infested with living larvae and pupae of Mediterranean fruit fly, our first interception of this host from Sicily.

Fruit fly served with airplane lunch.--Inspection at Brownsville of lunches supplied passengers on the airplane trip from Mexico City resulted in finding larvae of Anastrepha sp., probably A. ludens Loew, in a Mexican orange in one lunch.

DOMESTIC PLANT QUARANTINES

Forty States and the District of Columbia protected by transit inspection.--In the last quarter of 1935 transit inspectors intercepted 553 shipments of plant material and other restricted articles not conforming to inspection and certification requirements of the Federal interstate quarantines, consigned from regulated areas to 40 States and the District of Columbia. About 50 percent of the violations were from the Japanese beetle infested area, 39 percent from the gypsy moth infested area, and the remaining 11 percent from areas regulated under the quarantines relating to the Mexican fruit worm, the white pine blister rust, the pink bollworm of cotton, the Thurberia weevil, the sain moth, and the Woodgate rust, the latter intercepted at Philadelphia by inspector H. B. Colton, and representing the only violation of this quarantine found since it was established in 1923.

Phony peach disease under control.--A marked degree of control of the phony peach disease has been obtained as a result of the campaign of the past 6 years, which has been carried on cooperatively with the State officers. Peach growing in the area of severe infection is regaining its former place as the principal money crop of the area, according to William F. Turner, Bureau field leader of the project, in a paper recently delivered before a division of the Southern Agricultural Workers Convention at Jackson, Miss. "Aside from the definite results in economic control that have been achieved", Mr. Turner stated, "the work done has greatly decreased the probability of dissemination of the disease by means of infected nursery stock, principally through protection of such stock from possible infection." Owing to the slowness of the natural spread of the disease the first objective of the campaign is to

stop any possible spread of the disease by artificial means. If this factor can be eliminated it is believed that complete eradication of the disease may be feasible in sections where it is just becoming established, and may not be out of the question in any area where it may occur, regardless of its prevalence.

Progress in citrus eradication.--More than 10,000 properties have been worked by W. P. A. crews in the removal of 5,000,000 nonproductive citrus trees in 10 counties in Texas and 13 parishes in Louisiana, in cooperation with these States. Eradication in Jefferson County, Tex., was begun early in February, following the recent thorough inspection of all citrus trees in the county and the discovery of canker on six properties. The cooperation of the public has been received in all regions worked, consent for removing the trees having been given by about 98 percent of the owners including a few who had heretofore refused such permission. Their changed attitude may be attributed both to the tact of the inspectors and the recognition of the value of the work to the citrus industry. More applications have been received for clearing out old abandoned citrus nurseries and grove trees in the lower Rio Grande Valley than the workers have been able thus far to meet. There is some shortage in relief labor in the valley, the men having gone into commercial channels at the rate of from 4 to 6 per week, finding work in canneries or packing houses, or in planting their own crops.

Worthless peach trees removed.--It is estimated that over 7,500 properties have been worked by W. P. A. crews in destroying abandoned peach orchards and other worthless peach trees in 129 counties of the South and Southeast, in the 6-month period ending January 18. More than 7,375,000 such trees have been eradicated for the control of the phony peach disease, averaging approximately 1,000 trees to each property.

CONTROL INVESTIGATIONS

Physiologist appointed.--J. F. Yeager, formerly Associate Professor of Physiology at Iowa State College, has been appointed Entomologist at the Bureau's Beltsville, Md., laboratory, effective January 2, 1936. Mr. Yeager will continue his work on the physiology of insects, working first on the effect of nicotine on the heart pulsations of the American cockroach. He is assisted by J. B. Gahan, Junior Entomologist.

New toxic compounds found.--D. E. Fink, Orlando, Fla., is continuing his tests of synthetic organic compounds against mosquito larvae. Recently certain compounds were found that were more toxic than rotenone to the larvae, but none was more toxic than phenothiazine.

Metal turntable in operation for testing insecticides.--A new metal turntable was recently delivered to the Beltsville, Md., laboratory. This will replace the wooden turntable formerly used by F. L. Campbell and W.N. Sullivan for testing extracts of insecticidal plants against house flies.

BEE CULTURE

Resistance of American foulbrood spores to heat.--Throughout the beekeeping literature appear recommendations that to make honey safe to feed back to bees, particularly honey the history of which is unknown, it be diluted and boiled in a closed vessel for 1 hour. These recommendations have persisted regardless of the fact that G. F. White, as far back as 1920, found that spores of Bacillus larvae were not all killed after 3 hours at a temperature of 93° C. Recently C. E. Burnside, of the Beltsville, Md., laboratory, obtained growth in culture in a number of instances where spores had been kept in boiling water for slightly over an hour. An attempt will be made to reconcile the apparent discrepancy between results obtained in actual practice and those obtained in the laboratory.

Physiologist appointed.--R. M. Melampy of the Animal Nutrition Laboratory, Cornell University, N.Y., was recently appointed Assistant Physiologist in Apiculture and reported for duty at the Southern States Bee Culture Field Laboratory, Baton Rouge, La., on February 5. Mr. Melampy will take care of the research dealing with the physiology of queen rearing and the physiological changes that affect such factors as fecundity, longevity, and behavior.

IDENTIFICATION AND CLASSIFICATION OF INSECTS

Larvae of a North American weevil in ash seeds from Austria.-- A. G. Boving has identified as Thysonocnemis fraxinii Lec. four curculionid larvae interceded at Boston, Mass., by the Division of Foreign Plant Quarantines under Boston No. 11343, and recorded as occurring in seeds of Fraxinus pubescens arriving from Austria. The species is a North American form which infests ash seeds here. No representative of the genus Thysonocnemis has been known to occur in Europe, according to available records, although two species of Curculionidae, Otiorhynchus hirticornis Herbst and Cionis fraxinii Degeer, are associated with ash there. They are not seed feeders, however, and the larvae are easily distinguished from those of the Thysonocnemis.

Another European curculionid reported from the United States.--Specimens determined by L. L. Buchanan as Gymnaetron (Rhynusa) netum Germar, a European curculionid not before reported from North America, have been detected in the National Museum collection mixed with lots of the common G.(R.) teter Fab., the localities represented including points in New York, New Jersey, Connecticut, Pennsylvania, Virginia, and Iowa. The earliest date is July 3, 1914, on specimens collected at Farmingdale, N. Y. A series from Barcroft, Va., was reared by J. C. Bridwell from seed pods of Linaria vulgaris.

A dipterous parasite of a tarantula.--W. J. Baerg, of the University of Arkansas, has submitted for identification two specimens, in the early pupal stage, which were obtained from a tarantula taken near Tres Marias, Mexico, between Mexico City and Cuernavaca. According to the data accompanying the specimens, these emerged (presumably as larvae) about a year subsequent to the date on which the tarantula was captured. After considerable study, C. T. Greene has concluded that the specimens probably represent a species belonging to the family Anicoceridae. If this conclusion proves to be correct, the case is of unusual interest, as nothing appears to have been reported concerning the habits of any member of this dipterous family.

A sarcophagid associated with human intestinal myiasis.--D. G. Hall has identified as Sarcophaga bullata Parker specimens reared by J. Whitlock, Kansas State Agricultural College, and recorded under Bishopp No. 23190 from larvae obtained from a case of human intestinal myiasis in Kansas. This appears to be the first record of this type of association for S. bullata, although the species has often been reared in connection with cases of subcutaneous myiasis and as a scavenger.

New parasites of economic insects.--In a paper published in December in the Journal of the Washington Academy of Sciences (vol. 25, 1935: 547-564), R. A. Cushman describes several new species of ichneumonid parasites of economic insects on Grapholitha molesta Busck, Cremastus grapholithae, an abundant parasite of the peach worm especially in the southern part of its range; on Epinotia nanana Trietschke, Phaeogenes epinotiae, Fhaedroctonus epinotiae, and P. piceae; on Recurvaria piceaella Kearf., Phaeogenes epinotiae, Lissonota recurvariae, Nelionisthus piceae, and Fhaedroctonus piceae; on Tomostethus multinctus Rob., Aptesis ferruginea, Perilissus tomostethi, and Oocenteter tomostethi, the latter representing a new genus; on Laspeyresia youngana Kearf., Fhaedroctonus temporalis.

Specimens of new apple leafhopper parasite shipped to New Zealand.--In the November number of the Proceedings of the Entomological Society of Washington, issued January 17, C. F. W. Muesebeck has described under the name Aphelopus typhlocybae, a new anteonine (dryinid) parasite of the white apple leafhopper (Typhlocyba pomaria McAtee). The material on which the description was based was reared by H. M. Steiner, of the Vassar College laboratory of the New York Agricultural Experiment Station at Poughkeepsie, N. Y., who has now reported that entomologists of the Cawthron Institute at Nelson, New Zealand, have recently obtained a shipment of these parasites from the New York institution in an attempt to utilize them in controlling the yellow apple leafhopper (Typhlocyba australis Froggatt).

EDITORIAL OFFICE

The attention of this office has been called to an amusing editorial entitled "Technical Language", published in Chemistry and Industry, Volume 55, number 6 (London). Although written in England for English chemists, it is believed that it may have value in America, for American entomologists. The editorial says:

"Sir Francis Acland recently wrote to The Times and quoted this statement about a moth: 'It would appear from what evidence is available that the act of oviposition is immediately stimulated by the crepuscular diminution in the intensity of illumination, and the rise in relative humidity as the diurnal temperature decreases.' Sir Francis believes that this means: 'Egg-laying seems to be stimulated by twilight and the darkness of evening.' He has chosen, quite rightly, a striking instance of the love of long and unfamiliar words; very many such sentences could be quoted from current chemical literature and probably a few could be found in the pages of Chemistry and Industry. We do not quite know why such a style is so much liked by many authors and, we suppose, many readers. It is sonorous

and sexpedalian, like the late Sir William Harcourt, but we have never worshipped the long word when the short one is equally effective. In framing an address to a king or in drawing up a marriage settlement there is a style that is expected by the reader, one that has been hallowed by centuries of usage. Is it worth while for chemists to establish precedents of writing that are unnecessarily long and difficult? They are doing it, and if it is their wish no one can stop them. It was formerly thought dignified to write without using the short and common words. Dr. Johnson was a sinner whose example ought not to be followed. 'He was assaulted, during his precipitated return, by the rudest fierceness of wintry elemental strife; through which, with bad accommodations and innumerable accidents, he became a prey to the merciless rangs of the acutest spasmodic rheumatism' and so on. We think that we could write in that manner if we tried, but is it worth while? We have protested more than once, but if chemists wish to use a very learned style, it is futile to protest. We know that often one long word may express accurately the meaning of half a dozen short words; we have no complaint to make about this; we complain that the chemist uses 'optimum' when he means 'best', and uses optimum as an adjective into the bargain; we writhe when we see 'optimum conditions.' We complain when writers prefer 'function' to 'act'; 'the professor functioned as secretary', and so on. If we corrected papers as we should like to do, half the authors would never let us have their manuscripts again. It is all very sad."

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