

on the "two year plan," owing to the depredations of the weevil, and who now prefer the "one crop plan," would in all probability obtain better financial results by substituting the "fall planting plan" for the "one crop plan." The "two year system" of strawberry culture is to be preferred when possible as being the most desirable plan of the three. The question of hill planting and the "four or five year plan" has many points in its favor, but it is not fully considered here.

(12.) Rotation of crops, while being strictly in accordance with the best agricultural practice, is strongly advocated against this weevil. From popular opinion, red clover is suited to follow strawberries, followed successively by potatoes and rhubarb. Growers with large acreage, under judicious management, can combat the effects of this weevil satisfactorily with proper rotation alone, assisted by general cultural methods, but the smaller growers of ten acres or less, more or less congregated into communities, as they usually are, will not find rotation the same comparative benefit as the large grower, although of course a benefit will be noticed. It may be tentatively stated that not more than one acre in ten should be down to strawberries in an infested locality so as to provide for a system of proper rotation.

THE HONORABLE MR. ELLISON, Minister of Agriculture, offered a few encouraging remarks to the meeting on their re-formation and evident progress. He said that he personally had been much interested in the discussions which he had been listening to, and he only wondered that more people were not active Entomologists to study these questions on insect pests which yearly cost the province so much. He assured the Society of his regard and promised to do all in his power to obtain for them the necessary financial assistance.

MR. WILSON, Chairman, briefly thanked the Honorable Minister for his kindness at being present and for his assurance of some financial assistance to the Society.

ADDRESS.

THOMAS CUNNINGHAM, Inspector of Fruit Pests.

Ever since the creation of man, and in all ages of man on earth, we have evidence from remotest antiquity that the agriculturist and horticulturist have suffered enormous loss by the depredation of destructive insects and plant diseases. No country in the world, as far as is known, is free from this scourge. Animals, including man, and plants suffer from infection.

Probably there is no part of the world that has suffered more than North America, particularly the United States. The annual loss due to insect pests in the United States, as published by the authority of the United States Department of Agriculture, now reaches the enormous sum of \$1,272,000,000. This is more than the entire expenditure of the National Government, including pension roll and the maintenance of the Army and Navy. I quote from the authority of Professor C. L. Marlatt in the *Journal of Economic Entomology*, 1909, and the same author in the *Year Book of the Department of Agriculture of 1904*.

The question will naturally arise why the United States suffer more than other countries. The reason is easy of explanation. It is owing largely to the enterprise of the agriculturists and horticulturists in searching the world for new varieties of fruits, cereals, plants and vegetables. Hundreds of species not common to this continent, have been brought in from other parts of the world, including the Orient, the Mediterranean, Africa and as far north as Siberia. Australasia also has contributed largely to the list of economic plants of great value which have been brought into the States with the view of increasing the value of the products of the soil.

Many of these plants were infected with Scale and Boring insects which are kept under control by predaceous insects in their native country. Nearly all the predaceous insects fly, while the Scales adhered closely to the plant and the Borers were safely concealed in the body of the plants and trees, so that of course they were protected from the attack of their natural enemies. This accounts for the importation of pests, and not the parasites which hold them in check.

Most of these importations occurred before the discovery of such protective measures as fumigation with Hydrocyanic Acid Gas and Carbon Disulphide. In point of fact, there were no quarantine regulations governing the importation of new varieties of plants until long after many of them had been introduced into the United States. It was not until after the discovery of the San Jose Scale that any steps were taken to quarantine or inspect importations from the Far East, which is now known to be the home of some of the most destructive pests that afflict this country.

Not until the San Jose Scale had been widely distributed in California and several other States were any steps taken to bring this very destructive pest under control and prevent the introduction of other very serious pests.

It is acknowledged by the highest entomological authorities that over fifty per cent. of the noxious insects that prey upon plants and animals in the United States have been imported from foreign countries.

I will name a few: Codling Moth, imported from Europe; San Jose Scale, from China and Japan; Oyster Shell Scale, from Europe; European Fruit Scale; Gypsy and Brown Tail Moths; Mediterranean Fruit Fly. All these and many others have been imported direct from the countries producing the plants. The Hessian Fly, one of the most destructive pests that infect wheat cereal, was imported from Europe, so that taking the whole list of destructive insects, as stated above, over fifty per cent. were imported.

Had a judicious system of quarantine been adopted in the early history of North America, these destructive pests would have been kept out, and much of this terrible annual loss of \$1,272,000,000, would have been prevented.

While Canada may not suffer as much in proportion as the United States, still we have to pay our annual toll in the destruction of vegetables, grain and fruits. I am not sure that I can give a correct estimate of the annual loss of Canada, but I think it is safe to assume that it would bear about the same proportion as our neighbors to the south.

Fortunately for us, British Columbia suffers less than any other section of North America. This is largely owing to the early preventative measures that were instituted nearly a quarter of a century ago. California led the way to the adoption of quarantine inspection. Shortly after British Columbia fell into line, and the pioneer fruit-growers suggested to the Government the creation of a Board of Horticulture with power to formulate regulations for the inspection of nursery stock and fruit. It is greatly to the credit, I believe, of the horticultural pioneers that these preventative measures were introduced, and many of the most destructive pests have been kept out. If this Province is probably the cleanest country in the world today, I think it is largely owing to the foresight of the pioneer fruit-growers.

We have the reputation today of being the only Province in North America that is free from the Codling Moth, San Jose Scale, Gypsy and Brown Tail Moths and the several Fruit Flies. Shall this reputation be preserved, and how, is a matter that should receive the immediate consideration of the B. C. Fruit Growers' Association, the Central Farmers' Institute and the B. C. Entomological Society.

It devolves upon me to suggest the means that may be safely adopted for our protection. In doing this I am following the lead of California again, and also the Federal Government of the United States.

On December 24th, 1911, the Governor of California called a special session of the State Legislature to consider the passage of a Quarantine Law, which would enable the horticultural authorities to

frame regulations for the better protection of the State from the introduction of insect pests and diseases.

The time allotted to me is too short to give you more than a few quotations from this valuable law, the title of which is:

"An Act provided for the protection of Horticulture and to prevent the introduction into this State of insects or diseases or animals injurious to fruit or fruit trees, vines, bushes, or vegetables, providing for a quarantine for the enforcement of this Act, making a violation of the terms of the Act a misdemeanor, and providing a penalty therefor; providing that said Act shall be an urgency measure and go into effect immediately, and repealing that certain Act, entitled "An Act for the protection of Horticulture, and to prevent the introduction into this State of insects or diseases or animals injurious to fruit or fruit trees, vines, bushes or vegetables, and to provide for a quarantine for the enforcement of this Act," approved March 11, 1899."

Section I provides:

"Any person, persons, firm or corporation who shall receive, bring or cause to be brought into the State of California, any nursery stock, trees, shrubs, plants, vines, cuttings, grafts, scions, buds or fruit pits, or fruit or vegetables, or seed, shall immediately after the arrival thereof notify the state commissioner of horticulture, or deputy quarantine officer, or quarantine guardian of the district or county in which such nursery stock, or fruit or vegetables, or seed are received, of their arrival, and hold the same without unnecessarily moving the same, or placing such articles where they may be harmful, for the immediate inspection of such state commissioner of horticulture, or deputy quarantine officer or guardian. Provided, however, that all articles of nursery stock, trees, shrubs, plants, vines, cuttings, grafts, scions, buds, fruit pits, fruits, vegetables, or seed which are infested or infected with such species of injurious insects or their eggs, larvae or pupae or other animal or plant disease which may be or be liable to be injurious to the orchards, vineyards, gardens or farms within said State, shall be destroyed or reshipped out of the state as hereinafter provided. The said officer so making an inspection shall not permit any of the described articles so coming in contact with said infested or infected articles or any articles which might convey infection or infestation to be removed or taken from any such car, warehouse, depot, ship, dock, wharf or any other place until such infection or infestation shall have been destroyed."

Section 2: "Each carload, case, box, package, crate, bale or bundle of trees, shrubs, plants, vines, cuttings, grafts, scions, buds or fruit pits, or fruit or vegetables, or seed imported or brought into this state, shall have plainly and legibly marked thereon in a conspicuous

manner and place the name and address of the shipper, owner, or owners or person forwarding or shipping the same, and also the name of the person, firm or corporation to whom the same is forwarded or shipped, or his or its responsible agents, also the name of the country, state or territory where the contents were grown and a statement of the contents therein."

Section 4: "When any shipment of nursery stock, trees, vines, plants, shrubs, cuttings, grafts, scions, fruit pits, vegetables or seed, or any other horticultural or agricultural product passing through any portion of the State of California in transit, is infested or infected with any species of injurious insects, their eggs, larvae or pupae or animal or plant disease, which would cause damage, or be liable to cause damage to the orchards, vineyards, gardens or farms of the State of California, or which would be or be liable to be, detrimental thereto, or to any portion of said state, or to any of the orchards, vineyards, gardens or farms within said States, and there exists danger of dissemination of such insects or disease while such shipment is in transit in the State of California, then such shipment shall be placed within sealed containers, composed of metallic or other material, so that the same can not be broken or opened, or be liable to be broken or opened, so as to permit any of the said shipment, insects, their eggs, larvae, or pupae or animal or plant disease to escape from such sealed containers and the said containers shall not be opened while within the State of California."

Section 5: "No person, persons, firm or corporation shall bring or cause to be brought into the State of California any fruit or vegetable or host plant which is now known to be, or hereafter may become a host plant or host fruit of any species of the fruit fly family "*Trypetidae*" from any county, state or district where such species of "*Trypetidae*" is known to exist and such fruit, vegetables, or host plant, together with the container and packing, shall be refused entry and shall be immediately destroyed at the expense of the owner, owners or agents."

Section 6: "No person, persons, firm or corporation shall bring or cause to be brought into the State of California any peach, nectarine, or apricot tree or cuttings, grafts, scions, buds or pits of such trees, or any trees budded or grafted upon peach, stock or roots that have been in a district where the disease known as "peach yellows" or the contagious disease known as "contagious peach rosette" are known to exist, and any such attempting to land or enter shall be refused entry and shall be destroyed or returned to the point of shipment at the option of the owner, owners, or agent, and at his or her expense."

Section 7: "No person, persons, firm or corporation shall bring or cause to be brought into the State of California any injurious animals known as English or Australian wild rabbit, flying fox, mongoose or any other animal or animals detrimental to horticultural or agricultural interests."

Section 8: "Any person, persons, firm or corporation violating any of the provisions of this Act shall be guilty of a misdemeanor and shall be punished by imprisonment in the county jail for a period not exceeding six months, or by a fine not exceeding five hundred dollars, or by both such fine and imprisonment."

Acting under authority of this Law, the State of California has quarantined the States of Florida, North and South Carolina, Georgia, Alabama, Mississippi, Louisiana and Texas, or any other section known to harbor either of the "*Aleyrodes citri*" or "*Aleyrodes nubifera*."

"QUARANTINE ORDER NO. 15.—AUGUST 30, 1912."

WHEREAS, a quarantine order, No. 1, issued March 6, 1906, was declared against the Citrus White Fly (*Aleyrodes citri*) from the States of Florida and Louisiana, and only from these states, and,

WHEREAS, we have information from the entomologists of the United States Agricultural Experiment stations of the South Atlantic and Gulf States that this same White Fly (*Aleyrodes citri*) is widely distributed in North Carolina, South Carolina, Georgia, Florida, Alabama, Mississippi, Louisiana and Texas; and,

WHEREAS, it has been received into California on nursery stock from North Carolina and Mississippi, and,

WHEREAS, another species of the White Fly (*Aleyrodes nubifera*) is present in Florida, and,

WHEREAS, both of these White Flies are serious pests, being regarded in Florida as second to none in their injurious work on citrus and other trees, and,

WHEREAS, there is great danger of introducing "*Aleyrodes citri*" into the citrus groves of California on plants or nursery stock from each of the states aforesaid at the present time; and,

WHEREAS, there is danger of said "*Aleyrodes nubifera*" being introduced into California from Florida, and into the South Atlantic and Gulf States from Florida, and from thence into California, therefore it is

DECLARED: That a horticultural quarantine be and is hereby established against fruits and vegetables (excepting tomatoes), nursery stocks, scions, grafts, buds, cuttings, fruit pits, orange seeds, trees, vines,

plants and shrubs of all kinds imported from the States of North Carolina, South Carolina, Georgia, Florida, Alabama, Mississippi, Louisiana and Texas, or any other section known to harbor either "*Aleyrodes citri*" or "*Aleyrodes nubifera*," or both, into the State of California; all quarantine guardians and deputies of the State Horticultural Commissioner are hereby instructed and required to hold any and all such fruits and vegetables (excepting tomatoes), nursery stock, scions, grafts, buds, fruit pits, orange seeds and plants of all kinds, subject to the order of the shippers or owners thereof, for exportation out of the State, or to be destroyed."

"QUARANTINE ORDER NO. 14.—AUGUST 13, 1912."

WHEREAS, the alfalfa fields of the following counties of Utah: Salt Lake, Tooele, Juap, Utah, Wasatch, Summitt, Davis, Morgan, Weber, Boxelder, Cache and Rich; of the two counties of Idaho: Oneida and Bear Lake; and of Uintah County in the State of Wyoming, are infested with the Alfalfa Weevil (*Phytonomus posticus*); and,

WHEREAS, the devastation of this insect is very serious, often ruining the entire crop, and,

WHEREAS, our alfalfa product is very important, the estimated cash value the present year being a little short of \$50,000,000; and,

WHEREAS, there is danger of our receiving this pest through the importation of alfalfa hay from the counties aforesaid, as determined by the chief deputy of this Commission, who has visited and thoroughly studied the conditions in the devastated area;

WHEREFORE, it is declared that a quarantine be, and the same is hereby established against all alfalfa hay from the several counties hereinbefore mentioned of Utah, Idaho and Wyoming. All horticultural commissioners, local inspectors and deputies of the State Horticultural Commission are hereby instructed and required to refuse shipment into the State of California of all alfalfa hay from the said quarantined counties. If such hay is shipped into the State by any oversight, it must at once be destroyed or returned to the shipper.

All transportation companies are ordered to refuse for shipment into California any alfalfa hay from the said infected counties."

A. J. COOK,
State Commissioner of Horticulture.

Sacramento, Cal.

"QUARANTINE ORDER NO. 10.—JANUARY 29, 1912."

WHEREAS, There exists in the nurseries of Santa Clara, Alameda, Santa Cruz and San Mateo Counties a serious insect pest known as the

California or Western Peach Tree Borer, "*Sanninoidea pacifica*" Riley, and,

WHEREAS, Several affected trees have been shipped from said nurseries into other counties of California within the past few days; and,

WHEREAS, Said insect is a serious enemy of all stone-fruit-trees, as the borers girdle or seriously wound the crown of infested peach, plum, apricot, prune, nectarine, cherry or almond-trees; and,

WHEREAS, This caterpillar or borer is not known to be a pest in other counties and its introduction would be a serious injury, and must be resisted; and,

WHEREAS, The borer, when young or small will elude the keenest inspection; therefore, it is hereby

ORDERED, DIRECTED AND DECLARED: That a quarantine be and the same is hereby established in accordance with Section 2319b of the Political Code of the State of California, against the shipment of peach, plum, apricot, prune, nectarine, cherry and almond trees from any of the aforesaid counties."

A. J. COOK,

State Commissioner of Horticulture.

Sacramento, Cal.

These are fair samples of the Quarantine Regulations that have been enforced by the horticultural authorities of California. But they were not satisfied with their own state law. A movement was set on foot early in 1912 to bring pressure to bear upon the Federal Government to pass a general quarantine Act covering the importation of plants and plant products throughout the United States. This Act was approved by the President of the United States, August 20th, 1912.

The time allotted to me will not permit of reciting the provisions of the entire Act. I will, therefore, content myself with giving you quotations from the most important sections:

Section 4: "That no person shall ship, or deliver for shipment from one state or territory or district of the United States into any other state or territory or district any such imported nursery stock, the case, box, package, crate, bale, or bundle whereof is not plainly marked so as to show the general nature and quantity of the contents, the name and address of the consignee, the country and locality where such stock was grown, unless and until such imported stock has been inspected by the proper official of a state, territory, or district of the United States."

Section 5: "That whenever the Secretary of Agriculture shall determine that the unrestricted importation of any plants, fruits, vegetables, roots, bulbs, seeds or other plant products not included by the term "nursery stock" as defined in section six of this act may result in the entry into the United States or any of its territories or districts of injurious plant diseases or insect pests he shall promulgate his determination, specifying the class of plants and plant products the importation of which shall be restricted and the country and locality where they are grown, and thereafter, and until such promulgation is withdrawn, such plants and plant products imported or offered for import into the United States or any of its territories or districts shall be subject to all the provisions of the foregoing sections of this Act; provided that before the Secretary of Agriculture shall promulgate his determination that the unrestricted importation of any plants, fruits, vegetables, roots, bulbs, seeds, or other plant products not included by the term "nursery stock" shall include all field-grown florists' stock, trees, shrubs, vines, the United States or any of its territories or districts of injurious plant diseases or insect pests, he shall, after due notice, give a public hearing, under such rules and regulations as he shall prescribe, at which hearing any interested party may appear and be heard, either in person or by attorney."

Section 6. "That for the purpose of this Act the term "nursery stock" shall include all field-grown florists' stock, trees, shrubs, vines, cuttings, grafts, scions, buds, fruit pits and other seeds of fruit and ornamental trees or shrubs, and other plants and plant products for propagation, except field vegetables and flower seeds, bedding plants, and other herbaceous plants, bulbs and roots."

Section 7: "That whenever, in order to prevent the introduction into the United States of any tree, plant or fruit disease or of any injurious insect, new to or not theretofore widely prevalent or distributed within and throughout the United States, the Secretary of Agriculture shall determine that it is necessary to forbid the importation into the United States of any class of nursery stock, or of any other class of plants, fruits, vegetables, roots, bulbs, seeds, or other plant products from a country or locality where such disease or insect infestation exists, he shall promulgate such determination, specifying the country and locality, and the class of nursery stock or other class of plants, fruits, vegetables, roots, bulbs, seeds, or other plant products which in his opinion should be excluded. Following the promulgation of such determination by the Secretary of Agriculture, and until the withdrawal of the said promulgation by him, the importation of the class of nursery stock or of other class of plants, fruits, vegetables, roots, bulbs, seeds, or

other plant products specified in the said promulgation from the country and locality therein named, regardless of the use for which the same is intended, is hereby prohibited; and until the withdrawal of the said promulgation by the Secretary of Agriculture, and notwithstanding that such class of nursery stock, or other class of plants, fruits, vegetables, roots, bulbs, seeds, or other plant products be accompanied by a certificate of inspection from the country of importation, no person shall import or offer for entry into the United States from any country or locality specified in such promulgation, any of the class of nursery stock or of other class of plants, fruits, vegetables, roots, bulbs, seeds or other plant products named therein, regardless of the use for which the same is intended; provided, that before the Secretary of Agriculture shall promulgate his determination that it is necessary to forbid the importation into the United States of the articles named in this section he shall, after due notice to the interested parties, give a public hearing, under such rules and regulations as he shall prescribe, at which hearing any interested party may appear and be heard, either in person or by attorney; provided further, that the quarantine provisions of this section, as applying to the white-pine blister rust, potato wart and the Mediterranean Fruit Fly, shall become effective upon the passage of this Act."

Section 8: "That the Secretary of Agriculture is authorized and directed to quarantine any state, territory, or district of the United States, or any portion thereof, when he shall determine the fact that a dangerous plant disease or insect infestation, new to or not theretofore widely prevalent or distributed within and throughout the United States, exists in such state or territory or district; and the Secretary of Agriculture is directed to give notice of the establishment of such quarantine to common carriers doing business in or through such quarantined area, and shall publish in such newspapers in the quarantined area as he shall select notice of the establishment of quarantine. That no person shall ship or offer for shipment to any common carrier, nor shall any common carrier receive for transportation or transport, nor shall any person carry or transport from any quarantined state or territory or district of the United States, or from any quarantined portion thereof, into or through any other state or territory or district, any class of nursery stock or any other class of plants, fruit, vegetables, roots, bulbs, seeds, or other plant products specified in the notice of quarantine except as hereinafter provided. That it shall be unlawful to move, or allow to be moved, any class of nursery stock, or any other class of plants, fruits, vegetables, roots, bulbs, seeds, or other plant products specified in the notice of quarantine hereinbefore provided, and

regardless of the use for which the same is intended, from any quarantined state or territory, or district of the United States, or quarantined portion thereof, into or through any other state or territory or district, in manner or method or under conditions other than those prescribed by the Secretary of Agriculture."

Under authority of this Act, the Secretary of Agriculture for the United States has quarantined large sections of the States of Maine, New Hampshire, Vermont, Massachusetts, Connecticut and Rhode Island. This quarantine embraces coniferous trees, such as spruce, fir, hemlock, pine, juniper, cedar, arbor vitæ, and decorative plants, such as holly and laurel; forest plant products, such as logs, tan-bark, posts, poles, railroad ties, cordwood and lumber, and all field-grown florists' stock, trees, shrubs, vines, cuttings and other plant products for planting or propagation, and these shall not be moved or allowed to be moved, inter-state, or to any point outside the quarantined area, until such plants and plant products have been inspected by the United States Department of Agriculture, and pronounced free from the Gypsy Moth. Every crate, box, bale or other bundle of plant products, of which inspection is required by these regulations, shall be plainly marked with the name and address of the consignor, and shall bear a certificate showing that the contents have been inspected by the United States Department of Agriculture.

Carload or other bulk shipments of plants and plant products, for which inspection is required, shall not be transported or offered for transportation inter-state, by cars, boats or other vehicles, unless each shipment is accompanied by a certificate showing that the plants and plant products have been inspected by the United States Department of Agriculture, and pronounced to be free from moth infestation. Certificates of inspection will be issued only for plants and plant products which have been actually inspected by the United States Department of Agriculture.

On November 25th, 1912, until further notice, by virtue of said Section 8 of the Act of Congress, approved August 20th, 1912, it shall be unlawful to move in inter-state commerce, any of the above described plants or plant products from the areas herein quarantined, except in accordance with these regulations and amendments thereto.

On September 20th, 1912, the Secretary of Agriculture issued a quarantine against the plant disease known as "Potato Wart," "Potato Canker," "Black Scab" and so forth, prohibiting the importation into the United States of potatoes from Newfoundland, the Islands of St. Pierre and Miquelon, Great Britain, including England, Scotland,

Wales and Ireland; Germany and Austria-Hungary. The quarantine reads as follows:

"Now, therefore, I, Willett Hays, Acting Secretary of Agriculture, under authority conferred by Section 7 of the Act approved August 20th, 1912, known as the 'Plant Quarantine Act,' do hereby declare that it is necessary, in order to prevent the introduction into the United States, of the disease known as 'Potato Wart,' 'Potato Canker,' 'Black Scab' and so forth, to forbid the importation into the United States from the hereinbefore named countries, of the following species, namely, the common Irish Potato, '*Solanum tuberosum*.'"

Quarantine No. 2, against the Mediterranean Fruit Fly. The United States have quarantined their own favorite colony, the Territory of Hawaii. The quarantine reads as follows:

"Now, therefore, I, Willett M. Hays, Acting Secretary of Agriculture, under the authority conferred by Section 8 of the Act approved August 20th, 1912, known as 'The Plant Quarantine Act,' do hereby quarantine said Territory of Hawaii, and do prohibit, by this notice of quarantine No. 2, under the authority and discretion conferred on the Secretary of Agriculture by said Section 8 of the Act of Congress approved August 20th, 1912, the movement from the Territory of Hawaii into or through any other State, Territory, or District of the United States of the following fruits, seeds, vegetables and other plant products:

| | | |
|-------------------|----------------|----------------------|
| Alligator pears | Grape fruit | Natal, or Kafir plum |
| Carambolas | Green peppers | Oranges |
| Chinese ink berry | Guavas | Papaya |
| Chinese orange | Kamani seeds | Peaches |
| Chinese plums | Kumquats | Persimmons |
| Coffee berries | Limes | Prickly pears |
| Damson plums | Loquats | Rose apple |
| Eugenias | Mangos | Star apple |
| Figs | Mock Orange | String beans |
| Grapes | Mountain apple | Tomatoes |

"Hereafter, and until further notice, by virtue of said Section 8 of the Act of Congress, approved August 30th, 1912, it shall be unlawful to move any of the fruits, seeds, vegetables, or other plant products herein named from the Territory of Hawaii into or through any other

State, Territory, or District of the United States, regardless of the use for which the same is intended."

Done at Washington this 18th day of September, 1912.

Witness my hand and seal of the U. S. Department of Agriculture,

WILLETT M. HAYS,

Acting Secretary of Agriculture.

QUARANTINE ORDER NO. 5—"THE COTTON BOLL WEEVIL."

In order to prevent the introduction of the cotton boll weevil, "*Anthonomus grandis*," into the State of Arizona, it is hereby ordered:

(a) That the introduction of cotton seed into the State of Arizona from any other state or territory, or from any foreign country in which the cotton boll weevil is known to exist, is hereafter prohibited.

(b) That this quarantine order shall be immediately effective upon proper notification of persons concerned, against the following states and countries: Texas, Oklahoma, Arkansas, Louisiana, Mississippi, Alabama, Florida, Republic of Mexico, Guatemala, Costa Rica and Cuba.

(c) That this quarantine order shall be extended to any state, territory or country in which the cotton boll weevil may hereafter be discovered, upon public announcement by the Arizona State Entomologist.

(d) That all persons, firms or corporations in the State of Arizona are prohibited from having possession of, transporting, selling or giving away any cotton seed introduced into the State in violation of this order.

(Adopted November 1, 1912.)

QUARANTINE ORDER NO. 6—"CALIFORNIA RED AND YELLOW SCALES."

In order to prevent the introduction of either the California red (*Chrysomphalus aurantii*), or the yellow scale (*Chrysomphalus aurantii* var. *citrinus*), into the State of Arizona, it is hereby ordered:

(a) That the introduction of citrus nursery stock, either budded or seedling, into the State of Arizona, from any county in the State of California, with the exception of Tulare and Fresno, is prohibited.

(b) That this order shall not be construed to interfere with the introduction into the State of citrus bud wood under the provisions of the Arizona crop pest law providing for the inspection of shipments of such material at destination.

(c) That all persons, firms, or corporations in the State of Arizona are prohibited from having possession of, transporting, selling or giving away any citrus stock introduced into the State in violation of this order.

(Adopted November 1, 1912.)

(Extract from Monthly Bulletin No. 10, State Commission of Horticulture, Sacramento, California.)

"ARIZONA AND INSPECTION OF MEXICAN FRUITS."

It will be interesting to all California to know that Arizona has recently passed a law revising and giving added power to those in charge of the horticultural work there. With regard to the new work in Arizona, Dr. A. W. Morrill, State Entomologist, writes the following:

"The commission of Agriculture and Horticulture under our new law has informally adopted a quarantine restriction prohibiting the importation of mangoes, guavas, and oranges from Mexico. This quarantine order will be formally adopted as soon as the members have qualified for their new appointments under the amended law, which I expect will be in the course of a few days. During the next few weeks I shall be busy organizing our inspection service, and I expect that before the end of September I will have completed arrangements for the protection at Nogales similar to that which you have in California at your Pacific ports. As soon as the quarantine order of the Commission has been formally agreed upon I will send you a copy. These orders will include a quarantine order against white flies affecting citrus, the alfalfa weevil, and the Mexican orange maggot."

It will be thus seen that the United States are determined to prevent the introduction and spread of either destructive insects and plant diseases. This leads up to the question of the protection of our own favored Province.

Hitherto we have been using such preventative measures as the Regulations of the Board of Horticulture provide. All imported nursery stock is carefully dealt with, and our present system is found to be fairly adequate, but the time may come when it will be necessary to exclude the importation of nursery stock from countries known to be infected with dangerous pests and diseases not common to British Columbia.

We have also carefully inspected, as far as possible, imported fruit, grain and vegetables, but the time has come when, owing to the large importation of fruit, it is utterly impossible to adequately protect this Province.

During the year 1912 there were imported into Vancouver alone:

| | |
|---------|-------------------|
| 200,795 | Boxes Apples |
| 312 | Half-boxes Apples |
| 34 | Bbls. Apples |
| 708 | Boxes Crabs |
| 685 | Half-boxes Crabs |
| 37,045 | Boxes Pears |
| 590 | Half-boxes Pears |
| 27,755 | Boxes Plums |
| 88,100 | Boxes Peaches |
| 21,353 | Boxes Apricots |
| 139 | Boxes Nectarines |
| 2,755 | Boxes Prunes |
| 180 | Boxes Quince |

380,451 Total No. Packages

which I think would fairly represent half the importations into this Province of deciduous fruit from countries known to be infected with the Codling Moth, San Jose Scale and other destructive pests. As practically all this fruit was wrapped, and a thorough inspection would involve the unwrapping and inspection of each individual fruit, you will see how utterly impossible it is, no matter how careful we may be, to prevent the introduction of these destructive pests. It is a physical impossibility to unwrap, inspect, re-wrap and pack all this fruit, and restore it to the condition in which it is found when the packages are opened. It would involve the labor of over one hundred experts to handle the fruit properly in Vancouver alone, and then there is the added danger of infection being brought in in infected cars.

Many times during the year 1912 we have found cars badly infected with larvæ of the Codling Moth. These cars containing the larvæ are shipped throughout the Province, and if transformation from the cocoon stage to the moth occurs while the cars are passing through the Province, certain infestation is sure to follow.

In a word, under our present system it is utterly impossible to guarantee the protection of the country from the introduction of the Codling Moth and the Peach Worm.

I think the time has arrived when we should seek greater protection from the Dominion Government. In doing so, we are following the lead of California and the United States Federal Government. Surely we can make no mistake in adopting protective measures which are

now being rigidly enforced by our neighbors, with whom we are in constant communication.

I have, therefore, drafted the following resolution, which I will submit for the consideration of this Convention:

WHEREAS, the policy of the Dominion Government of Canada and the Provincial Government of British Columbia, respectively, has been for many years directed towards the encouragement of immigration into this Province; and,

WHEREAS, the aforesaid Governments have jointly and severally, by exhibitions, lectures, circular letters, bulletins and other means, pointed out to the intending settlers the splendid advantages that British Columbia offers, by reason of her climate, soil, geographical position and extensive markets; and,

WHEREAS, both the aforesaid Governments have from time to time, by numerous methods, held out to the intending settlers unmistakable assurance that the fruit industry would be fostered and protected by such legislation as may be found necessary in the development of the horticultural industry; and,

WHEREAS, the effect of such assurance has resulted in large and ever increasing areas of agricultural land being planted in orchards—many millions of dollars have been invested and numerous settlers of a very superior character have embarked in the fruit industry, greatly to the advantage of the Dominion and the Province; and,

WHEREAS, the importation of trees and plants during the three years ending December 31, 1911, reached the enormous total of 8,975,663, which, when added to the output of our local nurseries, will swell the total to considerably over 10,000,000 trees and plants, (this is the best evidence of the great expansion of the fruit industry); and,

WHEREAS, there is undoubted evidence before this Board that this valuable industry is now, and has been for some time, threatened with very serious danger by the importation of insect pests and diseases in fruit and fruit packages infected with such pests as Codling Moth, *Cydia (Carpocapsa) pomonella*, which attacks apples, pears, crab-apples and quinces, also several destructive scale insects, such as "*Aspidiotus perniciosus*," "*Aspidiotus rapax*," "*Saissetia oleae*," "*Lepidosaphes ulmi*," and several other scales of economic importance; also the very destructive Peach Worm, technically known as "*Anarsia lineatella*," which is reported by the horticultural authorities of California as being responsible for the annual destruction of from twenty-five to thirty per cent. of the entire peach crop of California; and,

WHEREAS, the imminence of the danger of the introduction of these destructive pests is abundantly proved by the returns of fruit condemned for infection at the Port of Vancouver, during the four years ending December 31, 1912, which are as follows:

| | | |
|------------|--------|----------|
| 1909 | 12,351 | Packages |
| 1910 | 8,394 | " |
| 1911 | 7,199 | " |
| 1912 | 16,949 | " |

Total No. Packages Deciduous Fruit.....44,893

besides some 27 cars intended for this market, but were diverted by reason of their infection, the shippers not caring to run the risk of condemnation. In addition to the number of boxes condemned at Vancouver, as above, there were 8,000 boxes condemned at the Port of Victoria during 1912. This, when added to the above, makes the sum total of packages condemned during the year at the two Coast cities, 24,949. This record abundantly proves the terrible danger which this Province is exposed to under the present system of importing such large quantities of fruit from countries known to be seriously infected with pests from which this Province is happily free; and,

WHEREAS, the United States Federal Government, in Congress assembled in the month of August, 1912, did enact a General Quarantine whereby nursery stock, plants, fruits, vegetables, bulbs, seeds or other plant products may be excluded from entering the United States and its territories when such nursery stock, plants, fruits, vegetables, bulbs, seeds or other plant products are shipped from any country known to be infected with diseases and insect pests not commonly found in the United States and its territories; and,

WHEREAS, the States of California and Arizona have already put into force the provisions of the Federal Quarantine Act, against the States of North Carolina, South Carolina, Georgia, Florida, Alabama, Louisiana, Texas, Utah and Hawaii, or other territory infested with certain insect pests; also the following countries foreign to the United States, namely, Newfoundland, the Islands of St. Pierre and Miquelon, Great Britain, including England, Scotland, Wales and Ireland; Germany and Austria-Hungary; therefore,

BE IT RESOLVED: That this Association, respectfully, but very earnestly, urge the Dominion Government to enact such legislation as will exclude deciduous fruit, such as apples, pears, crab-apples, quinces, peaches, apricots and plums from being imported into this Province

from countries, states and provinces known to be infected with the before-mentioned insect pests or other insect pests and diseases, not widely prevalent or distributed within or throughout the Province of British Columbia.

I may say that I have already submitted this resolution to several Boards of Trade throughout the Province, and purpose submitting it to every Board of Trade throughout British Columbia, requesting their co-operation and assistance.

It has been kindly received wherever it has been presented. At every meeting, except one, the resolution has been adopted unanimously, by a standing vote. I have found only two dissenting voices in the sections of the Province visited.

I plead most earnestly for the protection of the reputation of our beloved Province. It is not a question involving any difference of opinion or affecting trade in the slightest degree.

The question resolves itself into this: Shall we maintain our splendid reputation? Shall we protect the fruit-grower from the expense of fighting pests and diseases from which we are now immune?

This can only be done by quarantining countries that are known to be infected.

Fruit inspection has served a good purpose this far, but it is no longer a safe and practical protection.

I take pleasure in moving the foregoing resolution.

MR. BRITAIN—I take leave to second this motion and in so doing I wish to say that when I first heard about this measure and the course it proposed to adopt, the whole consideration appeared to me to be of too drastic a nature. However, we have received evidence that the same considerations are taking place across the line, and I must say that I have been somewhat astonished at the breadth of the movement. The evidence is now before us, skilfully compiled by Mr. Cunningham, and I feel now that we are fully justified in adopting measures such as have been proposed, and I believe that we as a Society of Entomologists should lend our thorough support.

MR. TREHERNE—I also believe this measure to be sound from our standpoint as entomologists, as it seems to be in accordance with up to date present day economic entomology. I believe, however, it should be carefully considered before we pass judgment upon it. When we cannot inspect for an insect pest with safety to ourselves then we are justified in placing quarantine measures against it, and there seems little doubt that cases arise in Codling Moth inspection which cannot be

covered by an inspection certificate. Our only resource then is wholesale condemnation or quarantine. If we as entomologists pass this resolution I have no doubt our opinions will carry weight with those, through whose hands the measure will go, for we are judging the situation from a scientific and unbiassed standpoint. We have nothing to lose or to gain by it beyond that of the protection of the Province from dangerous insect pests, consequently we can only judge this issue on its merits, and it is only on its merits as an entomological problem that it should be judged.

MR. TAYLOR—An exactly similar state of affairs occurred in Cape Colony, South Africa. Certain districts infested with Codling Moth were isolated and kept isolated.

MR. TREHERNE—When was that?

MR. TAYLOR—Some four or five years ago.

MR. WILSON—Will whole states or only infested territories or localities be barred in this resolution?

MR. CUNNINGHAM—That is a matter for the Government to deal with.

MR. LYNE—To show any exemption in this regard would be dangerous.

MR. BRITAIN—Has the Province power to isolate districts in the Province?

MR. CUNNINGHAM—That has not been fully dealt with. Perhaps by way of further explanation, it might interest the members to know that during the season of 1912 a slight infection of "*Cydia (Carpocapsa) pomonella*" was discovered near Armstrong. After samples had been submitted to me, I immediately got four of my staff on the ground. We made a close inspection from tree to tree, and succeeded in locating the infection in about a dozen trees, close up to the wire fence which separated another orchard. The infection had, I believe, come from the adjoining orchard. At any rate, we found it on both sides of the fence.

I negotiated with the owners for the purchase of the fruit, as it was of the utmost importance to stamp out the infection lest it should be carried by air currents down the Okanagan Valley. We examined every tree in the two orchards, and to make "assurance doubly sure," we extended the inspection to the next adjoining orchard. The quantity of the fruit was estimated and a lump sum was agreed upon, to be paid for all the fruit in the three orchards. After this had been done, I engaged a number of men to pick the fruit. I bought several hundred

sacks and had every fruit in the three orchards, including apples, pears, crab-apples and quince, picked and carted to the sawmill, where I had provided a large tank holding half a carload of apples. Into this tank two jets of steam from the boiler were introduced. I placed 2x4 inch scantlings on the bottom of the tank and put rows of sacks on top of these scantlings. This was to permit the steam to circulate all around the sacks, so as to ensure the cooking of the fruit. Tier after tier was then placed until the tank was full. We then turned on the steam, but unfortunately the pressure was too great, and not only cooked the apples, but blew the pulp and seeds through the sacks, covering the sides of the tank and cover with about an inch of apple pulp. However, needless to say, all the larvæ were destroyed.

In the second grist that we put through we reduced the pressure to about 120. This cooked the apples completely in the course of a few hours, all the fruit being reduced to pulp.

I regard this as a very valuable discovery, as it will enable us, when we shall have completed the new Fumigating Station, to provide a chamber whereby we can steam to pulp all condemned fruit rather than have it cremated at a very large expense. This pulp, after having been steamed thoroughly, will constitute food for animals.

Dealing with these three infected orchards involved a very considerable expense. We paid for the apples and cooked them, but I consider that no expense is too great if we are to succeed in stamping out incipient infection. This, I believe, has been done most effectively, because I have been able to prove by several experiments that the only way this Codling Moth can be stamped out is to destroy the food on which the larvæ feed.

I am informed that as the result of my success at Kamloops, which is well known to most of the entomologists present, Australia has practically adopted a similar method. I am informed by Mr. Hutchison, who has recently returned from Australia and is now resident on the Delta, that this destruction of the fruit is the favorite method of dealing with Codling Moth infection in the Australian States. Mr. Simms, who has been for many years in the Government Service in New Zealand, reports that the Government adopted that method in dealing with the Fruit Fly.

That we have succeeded in stamping out the infection at Armstrong, I have the best reasons for believing. The question now is how was this infection introduced? It is my opinion that cases which contained nursery stock which had been shipped from Oregon had been previously stored in fruit-houses badly infected with Codling Moth, and

became infected, thus conveying the infection to the orchard where we discovered the larvæ. I made diligent enquiry on this point and found that a case of trees had been delivered in the adjoining orchard early last spring. The nursery stock was taken out and planted, but the case was allowed to remain for some months. I believe that probably the larvae transformed early in the month of May and found the conditions just right, with food already prepared.

It will be asked how can we guard against a repetition of such infection? My plan is to have a chamber constructed in the new Fumigating Station which is about to be built, in which cases containing nursery stock and the packing used shall be run into this chamber and steamed. This will eliminate all possible danger of carrying infection over in the case or packing.

I may add that the orchards in question will be carefully sprayed with Arsenate of Lead, not once nor twice, but three times during the coming season, at the rate of three pounds of Arsenate of Lead to the barrel of water. The spraying will be done by my own staff, as we do not intend to take any chances in dealing with this insidious pest. It goes without saying that it will be impossible for the Government to continue this system of purchasing fruit. The expense would be too great; besides there might be cases of the introduction of the pest all along the Boundary Line where thorough inspection would not always be available. The only rational and business method of protecting ourselves is to rigidly exclude the importation of fruit from countries known to be hopelessly infected with the Codling Moth.

We had another slight outbreak this season at a place named Rutland, adjacent to Kelowna. This was different in kind from Armstrong. The infection was not introduced in fruit nor yet in nursery stock cases, but was traced to baggage and household effects that had been stored in a fruit cellar in a section of Ontario, pending the removal of the owner to British Columbia. The cocoons were undoubtedly conveyed in this household stuff. The owner innocently conveyed the infection from his farm house to the orchard, which he had recently purchased at Rutland.

This involves another problem which will be difficult to deal with. The question arises what shall be done to prevent infected baggage and household effects from coming into this Province? It is a difficult matter to deal with, but a remedy must be discovered, for we cannot afford to take the risks of the introduction of the Codling Moth into this fair Province. We shall have to devise some means whereby baggage may be closely inspected on the frontier. This may be an inconvenience

to the immigrant coming from infected countries, but every precaution must be taken, and the means found whereby we can successfully deal with it.

Another problem that awaits solution is how best to deal with cars infected with cocoons of the Codling Moth. We have found during the year 1912 in the Okanagan Valley cars that had been sent in to load with potatoes and other farm produce were badly infected with cocoons of the Codling Moth. These were mostly cars from the American side that had come to Vancouver and other points with American fruit. Needless to say, this constitutes a very serious danger, for if transformation takes place while the cars are in British Columbia, the moth will surely seek its natural food and thus obtain a footing in the nearest orchard. Of course, if the quarantine be established, it will reduce the number of infected cars that cross the Boundary. The difficulty in dealing with this problem arises out of the fact that all such cars do not come to Vancouver. They may come in at Mission Junction or other points.

The question arises, what steps shall be taken to deal with these infected cars? Fumigation with Carbon Bisulphide would be a successful remedy, but we could not reach all the cars that come in, nor keep track of them. This is another problem which needs solution, but I trust that a way will be found to deal with it successfully.

We have been fairly successful this far in solving some very serious problems and I trust that a way will be found whereby we can handle this. At any rate, the quarantine protection, which we are seeking, and which I think we have the right to demand, will go a long way to eliminate the dangers to which this Province is exposed at the present time.

MR. CHAIRMAN—Any further discussion? If not, you have heard the resolution placed by Mr. Cunningham before you, that a system of quarantine be requested to prevent the introduction of fruit infected with dangerous insects from entering the Province.

(Resolution adopted by unanimous standing vote.)

MR. CUNNINGHAM—I feel very much pleased at your endorsement of my resolution and thank you accordingly. I know that your voice on this question will carry a great deal of weight in the matter of its enforcement, for, as has been said, you are judging the issue on its merits as an entomological problem, not with any idea of pecuniary profit. Before closing this subject I would like to ask your consideration on just one more point. I want a representative appointed from this society to assist in the future developments of my resolution. I will

propose the name of our Secretary, Mr. Treherne, to act as representative for the society.

(Seconded and passed.)

MR. TREHERNE—I feel very much honored at this appointment. I will say that provided it does not interfere with my official work I shall be only too pleased to assist in any way for the benefit of the Province.

NOTES AND OBSERVATIONS ON THE SEASON.

W. E. SCOTT, Esq.,

January 8th, 1913.

Deputy Minister of Agriculture,
Victoria, B. C.:

DEAR MR. SCOTT,—

I shall be glad if you can bring before the attention of the Entomologists about to assemble in Victoria, two pests which in my own garden give a good deal of interest. One is a large white grub, which bores into the roots of the oak trees for a distance of one or two feet. While it is found in decayed woods, it is quite possible that the decay has been caused by the operation of the grub.

In the summer time the leaves of our elm trees are covered with an insect of the nature of thrip, which consumes all the green matter on the leaves and spoils the beauty of the trees. We have tried to get rid of this by spraying with water, but this has not been effectual.

I shall very much appreciate any suggestions which will enable the above pests to be exterminated.

Yours truly,

(Sgd.) J. J. SHALCROSS.

P. O. Drawer 730, Victoria, B. C.

MR. ANDERSON said that the Borer was probably *Prionus californicus*. He did not think that it did any serious injury as it does not bore in the green wood.

MR. BRITAIN said that the "Thrips" referred to were probably the Elm Leaf Hoppers, popularly called thrips.

R. C. TREHERNE,

July 3rd, 1912.

Hatzic, B. C.

DEAR SIR,—

. . . . You will be interested to know that the caterpillars of what I have always called the American Tortoiseshell, have been most active at Cascade this year. We had a number of butterflies carry over the winter in the school house, and the children watched them carefully.

The eggs were laid on the leaves of an evergreen shrub with an aromatic odor, popularly known as "buck brush." Apparently the entire life is spent on these bushes, as everywhere they were completely stripped of leaves, and when I left the caterpillars were hanging themselves along the bare stems and changing into chrysalids. We had a number of the caterpillars at the school