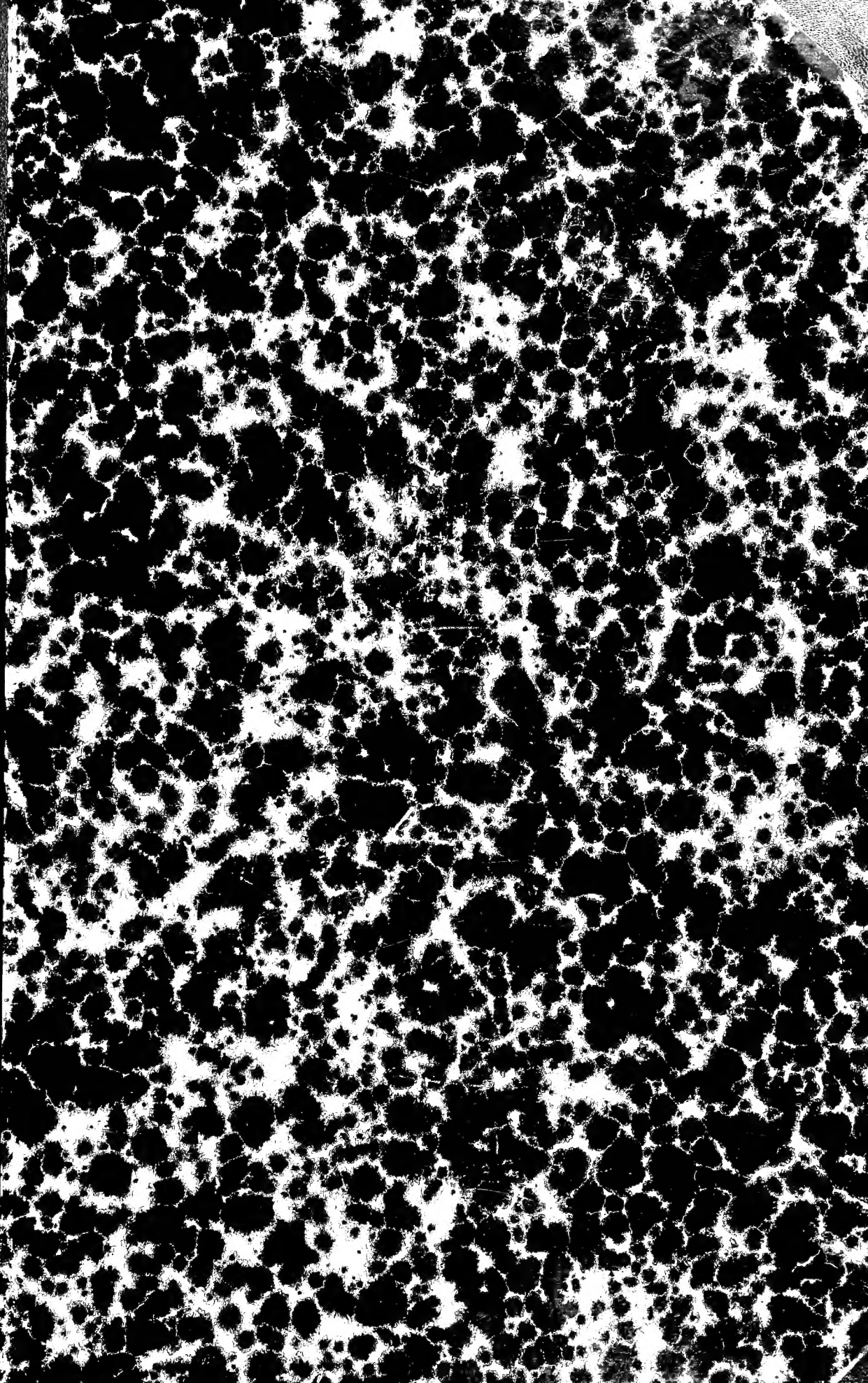


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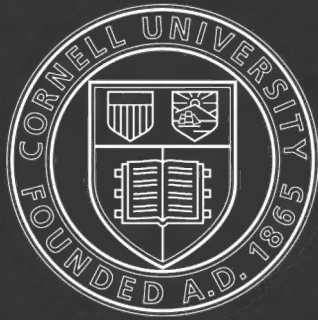
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Legislation in Connection with Plant Diseases

by

H. T. Güssow

(Dominion Botanist, Dept. Agr. Ottawa, Canada)

Presented before the American Phytopathological
Society at Cleveland, Ohio

Jan. 3, 1913.
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C O P Y :

Ottawa, Jan. 16, 1913

Prof. H. H. Whetzel,
Cornell University, Ithaca, N.Y.

Dear Professor Whetzel :

In answer to your request I have much pleasure in sending you a copy of my paper on Legislation in Connection with plant diseases. This paper as read before the Cleveland meeting is substantially the same as one read for me at one of the meetings of the International Horticultural Exhibition held in London during the past year and embodies the results of my experience in this direction. I may add that the subject of a national agreement to prevent the export of diseased vegetation is being seriously considered by the various self-governing countries of the British Empire; if such an agreement takes definite shape, it will be interesting to watch its working and to see what possibilities it affords for an international application of the same principle.

I am also sending you, under separate cover, a copy of a bulletin recently published by our Department of Agriculture which gives a summary of all such legislation, Federal and Provincial, at present in force in Canada, and which I trust will be of interest. I possess, however, copies of very few of the legislative acts of different countries and have to rely chiefly on the summaries and notes given in the Journal of the Board of Agriculture (London, Eng.), the bulletin of the International Agricultural Institute (Rome), Hollrung's Jahresbericht and Just's Jahresbericht, all of which are no doubt familiar to you.

Our inspection work in connection with potatoes is now drawing to a close for this season, but I will try and procure a quantity of tubers with Spongospora and have them disinfected and shipped to you.

With kind regards,

Believe me,

Yours faithfully,

(Signed) H. T. Güssow.

Dominion Botanist

By

H. T. Güssow, Dominion Botanist,
Department of Agriculture, Ottawa, Canada.

Anyone whose duties have brought him into contact with the important problem of protecting the agricultural, horticultural and other economic crops of a country from destructive diseases, particularly from fungous and bacterial plant diseases liable to invade the country, must have fully recognized that he is indeed confronted by one of the most perplexing problems - difficult, if at all possible of solution.

This statement may be readily proved to be correct, partly by the total absence in a number of countries of a legislative measures directed against the spreading of plant diseases within the country, and, partly by the inefficiency or impracticability of systems that may be in force in other countries. The whole difficulty is no doubt to a large extent due to the fact that, hitherto, plant pathologists have made no attempt to carefully devise and consider practical useful means by discussing the value of the proposed legislation at national or international conferences.

The question of legislative measures against the spread of diseases of economic plants demanded consideration after the serious and destructive nature of insects like the Grape-vine Phylloxera, the San José Scale and the Colorado Beetle was more fully recognized, at first in countries where these pests existed, to be followed by other countries by measures directed mainly against the invasion from such truly undesirable aliens. The

very fact that legislative measures were considered expedient to effectually control insect pests of this kind, really amounts to a confession of ones ignorance of successfully controlling diseases without more or less stringent compulsory efforts. The oldest Pest Acts we know of dealt exclusively with the control of the insects mentioned.

Soon, however, it became evident that there existed equally grave dangers to vegetation from other sources, viz., diseases of economic plants due to fungi and bacteria. Michigan appears to have been the first state to adopt legislative means to effect the control of a plant disease - Peach Yellows. This state passed in the year 1875 the so called Peach Yellows' Act.

With the progress of knowledge, especially since it was discovered that vegetation may be entirely freed from certain injurious insects by fumigation or dipping, the number of Pest Acts was steadily increased; other countries following the same policy, but mainly touching upon entomological problems. The uselessness of similar means if applied to vegetation infested with fungus diseases was immediately recognized. However, the knowledge that these means were useless in the latter respect, and although no similar preventive means were known, yet within more recent times many countries began to amend their Acts with the intention of including the problems arising from the prominent nature of certain communicable fungous diseases of plants. It might have been foreseen that their somewhat hasty action would be liable to result in failure in many instances. And after some experience with the measures proposed against fungous diseases this mistake was fully realized. This question requires careful study of the

special requirements. Indeed it became more and more evident from the impracticability and inefficiency of such policies, that efficient legislation against fungous diseases proves to be one of the most difficult problems, the successful solution of which, let it be understood in the beginning, is exclusively a matter of national and international agreement. The great difficulty of devising practical and protective policies is evidently due to our own ⁱⁿ experience in this direction, when suggesting means likely to meet the special exigencies. The confidence that matters would ultimately adjust themselves in the right way is misplaced, at any rate in the mean time our faith in this respect costs the Nations incalculable sums of money. One of the greatest drawbacks to success in legislation directed against the spread of fungous pests, is that practically all different diseases call for different measures of control. It is almost impossible to lay down hard and fast rules governing the control of diseases of all kinds.

The only practical means to obtain results suiting this purpose of legislation would be co-operation of experts engaged in this kind of work assisted by farmers, gardeners, fruitgrowers, produce importers and representatives of any other industries affected by such measures. Quite recently, I understand, measures dealing with legislation against fungous diseases were introduced before the House of Representatives in the United States with the result that nurserymen and others whose industries it was the desire to protect, voted unanimously against the proposal. Experience in enforcing many of the rules laid down in existing Disease Acts has taught me that they do not meet with

the approval of many, while some of the rules, especially those concerning prohibition of imports, are considered a boon to unscrupulous men who will immediately "corner the market".

It has been already stated that most of the Plant Disease Acts or regulations thereunder were modelled on entomological lines, or that amendments were simply incorporated in existing Insect Pest Acts. The outcome of this practice has resulted in making many provisions impracticable or impossible of enforcement, and the laws remaind a dead letter affording no protection whatever. I may be allowed here to briefly refer to provisions generally to be found in the Acts "in force" in the various countries.

Every country having such acts specifies more or less definitely the special diseases against which it is deemed desirable to take action. Some countries specify "all diseases" others again seek to guard against diseases like the Phytophthora infestans and other common diseases. The next point is that the legislation seeks to cover the control of diseases within a country's own borders, but also incorporates regulations directed against the importation of diseases from without.

In some instances we find provisions requiring certificates issued by an official expert in the country of export to accompany shipments of vegetation from certain countries stating that the "imported stock" has been grown in districts or areas free from the disease specified.

Further, we observe clauses directing that : Any shipment shall be held in quarantine and not be admitted until its freedom from "specified" diseases has been fully established.

In other instances methods of treatment are devised to be given to any shipment suspected of being infected with destructive

diseases.

The next point in common deals with inspection of all or suspected shipments at the port of entry. Naturally, according to size and requirements of the country, one or more ports of entry are necessary to deal with the often large consignments of plants arriving.

In consequence of inspection - the detection of any disease calls for "destruction" "refused permission of entry" "return to consigner" and necessitates provisions for "granting" or "refusing" compensation. Further, enactment setting forth "fine and imprisonment" on summary conviction for any person who contravenes any of the regulations made under the Act, and so forth.

From a careful study of the "Acts" existing in a large number of countries, there is one conspicuous fact, viz., they are copied one from the other, amended and improved with more or less success, but with little signs of co-operation - if any at all - with other countries, or even with the persons whose business it is to import vegetation or produce of any kind.

In discussing some of the more obviously impracticable provisions regarding the control of fungous diseases under the existing enactments, I wish to confine my criticism almost entirely to the safeguarding of a country's agricultural or horticultural interests by preventing the importation of diseases from without its borders.

The Acts specifying vaguely "all diseases" as being excluded are practically impossible. No man with even slight experience of the great difficulties connected with recognizing the symptoms of fungous diseases, especially in their incipient stages, would

for a moment consider this practicable. The detection of even so well known a disease as the common potato disease (Phytophthora) may be easy in many instances, but if associated with Fusarium rot, Bacteriosis, etc., is not practicable without microscopic research - which is out of the question - and in many cases the ^{value of a} total consign-
ment is not worth it. The recognition of bacterial diseases necessitates time for incubation and diagnosis. It is another practical impossibility.

As regards "certificates" accompanying shipments stating "the freedom from disease" or "that the vegetation comprising a shipment has been grown in localities for a certain radius known to be free from diseases," it has been my experience that while such certificates may be of some use, they are in many cases absolutely unreliable, because the official issuing them, though he himself may be quite competent, which is often not the case, cannot be sure that any samples submitted to him for examination truly represent the "bulk" of the shipment. These certificates, though issued with the best intentions, are generally based upon information supplied by inspectors, some of whom are more reliable than others. It is the practice of produce exporters to buy their supplies generally in more or less small lots, as, for instance, with potatoes. These are collected at their warehouses, sorted - by which is often meant that they are generously mixed, and then shipped in car-loads. Some few years ago it was my experience to be asked to examine a sample of potatoes, the consignor stating "that they truly represented the bulk of shipment". On subsequent legal proceedings it appeared that the potatoes submitted to me for inspection - and pronounced free from disease - were forwarded after

this particular consignment had been at sea for days, and on arrival in port of the importing country was condemned by the authorities for being diseased; the sample, however, had been obtained elsewhere. Unless such a certificate affords guaranty for the inspection of the shipment to which it applies at the port of exit, stating that the vegetable matter has been found free from disease and has been officially sealed in the ship or car, it cannot practically serve its purpose. In addition, I question again the possibility of certifying any kind of vegetation to be free from certain diseases. It has been my experience in Canada to be able to certify when a shipment is diseased - but never the contrary with an entirely free conscience.

This reference introduces the problem of "inspection at the ports or ports of entry". The United States and Canada have been seriously threatened of late years by the introduction from Europe of two very undesirable diseases, White Pine Blister Rust and Potato Canker. In a bulletin recently published by the United States Department of Agriculture, Division of Forest Pathology, it is stated: "Inspection cannot detect affected trees except those which already have developed swellings or fruiting bodies. The Blister Rust vegetates in the bark tissues of pine for a number of months before any external signs of its presence are visible. This period of incubation is of uncertain length, but apparently varies from about one year to several years. During this time no inspection, however, thorough, can detect the disease."

It will be easily understood what the consequence to Canada and the United States of America would be of the establishment of this disease, which is correctly considered one of the most

destructive diseases of white pines and related forest trees. Moreover, the importations of such seedlings take place generally in April when it is not possible to observe the conspicuous rust pustules which do not appear until June, when the trees have long since been distributed.

Now with regard to Potato Canker. This disease had found its way into Newfoundland in 1909 where I traced it to an importation of potatoes from Scotland. In that country there have not been in force any measures preventing or controlling importations of diseased vegetable matter. Hence Potato Canker has become established to a considerable extent. The Newfoundland Government has now realized this danger, but too late.

In Canada, I regret to say, we have actually discovered this disease in a considerable quantity of potatoes imported from England. There has been a deplorable shortage in the potato crop of 1911 which necessitated the importation of large supplies of this staple food, and thanks to careful investigation we are forewarned of this great danger.

After personally inspecting a car-load of potatoes - 400 bags of 160 lbs each - in bulk not in bags - I have come to the conclusion that it is possible to detect the presence of this disease, but it is hardly feasible to certify its absence. Anybody doubting this statement is advised to try the experiment of inspecting a car-load of potatoes himself. We have, for certain reasons, in force in our country an Act granting compensation at a rate not exceeding $\frac{2}{3}$ of the value as assessed by the inspector for any vegetation and vegetable matter destroyed on finding it affected by the disease or diseases scheduled under our Act, but this has now

been dropped as far as imported potatoes are concerned, as it seemed too much like encouraging the disease.

I may here point out that in order to carry out inspection at all it is necessary to maintain a staff of men, one of which at least should be a trained official, at each port of entry. The salary of these, wages for manual labor, travelling expenses, compensation for destroyed vegetation - notwithstanding all these precautions, the ever prominent danger of failing to recognize an infected shipment - this sort of thing will not be found worth the whole of the importations in years when potatoes are less scarce. Whether this effort will pay in years when potatoes are scarce, will be shown only after a year's work has been done; concerning the control of this disease, should it become established, the cost of all this should, of course, be added to the expense of maintaining inspectors, including compensation for destroyed shipments, and may be counterbalanced by the total value of all potatoes imported. It is very doubtful if the balance will be found on the right side.

I have pointed out by the foregoing examples, besides the inefficiency of inspection - however thorough it may be believed to be, also indirectly the folly of a quarantine in a case like this, and, finally, the serious consequence of compensation - none of which adequately serve their purpose. Compensation may be a matter worthy of consideration, when dealing with a crop destroyed within a country's borders, but to grant it for the destruction of imported matter is nothing short of encouraging, or at any rate facilitating the importation of destructive diseases.

Without going into further details there cannot be any doubt that these measures are exceedingly inefficient, if not unwise,

notwithstanding all possible care in execution, besides being liable to cause serious complications in the trade and commerce relations with other countries. Measures which also tend to create antagonism against the iron hand of the law cannot possibly serve a good purpose, and none of the regulations under the existing Acts that I have come across in my search for information, can be said to cover adequately this serious objection.

In the following remarks I venture to outline very briefly a scheme which has appeared to me to solve some of the existing difficulties but I am well aware of the important fact that we can only learn by our own mistakes - and these proposals may on practical working soon show defects, which at present do not occur to me.

Briefly, the more or less costly, practical or impractical policies maintained in the various countries where any such measures are in force, with a view of safeguarding important economic industries from an invasion with fungous diseases, arise from the export of diseased vegetation.

We are nowadays much concerned about questions of international peace and good-will, but it appears to me that notwithstanding international agreements regulating the commercial and trade relations of countries, that one important point has been totally lost sight of, i.e. the malpractice of exporting diseased vegetation, and thus spreading from province to country - country to continents, dangerous fungous diseases, and instead of preventing altogether these serious dangers through a practical agreement with other nations, there is being practiced wholesale all the world over a policy of exportation of serious diseases against which every country is so anxious to

protect her interests from within and without. It seems a surprisingly ludicrous policy - within each country war is waged against diseases - but countries willing to spend millions to control diseases within its own borders, distributes the very same disease all over the world without the slightest hesitation or concern.

Not until we are able to devise practical means to prevent the continuance of this practice and, what is more, have these recommendations universally adopted, will the problem of fighting diseases be successfully solved. Certainly the prohibition of the importation of all kinds of vegetation affected by diseases is quite useless.

In conclusion of my address let me consider the more important features of such a measure. It is at once apparent that it would be of no use trying to carry out this or any other similar scheme in practice without an international agreement and international effort. In order to carry into effect this plan, careful consideration should be given and all objections be carefully discussed to meet the special requirements. Let us consider that such a measure would be found practicable, what are the necessary steps to take to render this scheme possible of execution: For this reason let me call to your mind

1. The large expenditure necessary to maintain a service of inspection, and all incidentals connected with such work, at the port or ports of entry.
2. The considerable cost of compensation for any destroyed vegetation found diseased on importation.
3. Notwithstanding inspection and compensation, the very dubious efficiency of such measures when dealing with fungous and bacterial diseases.

4. The burden which would rest upon a country to provide the necessary appropriation for the control of a newly introduced disease.
5. The national loss which would result from the ravages of such disease among the valuable economic crops of the country.

If we would be able to approximately estimate the annual cost for carrying on this kind of fruitless work together with the losses from such diseases, you must grant that the same would reach an incredible figure. Remember for a moment the cost of fighting imported pests like the Gipsy Moth, Browntail Moth, Potato Canker, Gooseberry Mildew, Phytophthora infestans and scores of others - all this vast expenditure could have been saved if the export of diseased vegetation affected by other insect or fungous diseases would have been made an international offense. No doubt there are many similar laws and agreements in force among nations, unquestionably effecting a universal blessing.

The invasion of countries by destructive diseases will take effect more and more as all methods of rapid traffic and the competition among nations would serve to spread disease. It is obvious that the saving of the immense sums now spend in many countries in their effort to protect important agricultural and horticultural industries from the invasion of diseases, by the universal adoption of such measures prohibiting or making ~~or~~ making it illegal under penalty to export diseased vegetation, would result un greatly increased funds for the carrying on of a very efficient system of controlling and combating diseases ex-

isting within a country. Eventually this work must result in the destruction of diseases to such an extent that the prohibition of the export of diseases - now apparently so difficult a measure - would resolve itself into a practicable and comparatively simple one.

It will be quite realised that whatever the changes are which may be effected to improve the existing systems, that time and experience only will insure the expected benefits in their full degree. This policy would serve well a double purpose - the control of existing diseases, and the assurance of being protected from wilful invasion from without.

The control of all kinds of diseases within each country should be its most earnest aim, and would naturally result in increasing the confidence in the trade and commerce with ones neighbors, preserve peace and encourage closer relations among all nations.

It may be argued that the prohibition of the export of diseased vegetation would be as impracticable as the prohibition of the import, and I have myself just pointed out how inadequate such measures may be, but we must not forget that generally vegetable imports take place during a comparatively short period, at which it must often be decided in haste when working under severe pressure from shipments arriving in port in large numbers, whether a particular shipment is free or not from diseases, whereas in the carrying out of exportation prohibition, the standing field crops of a country could have been carefully surveyed and certificates have been issued as to their freedom, or the freedom of entire countries or areas within it from certain diseases. A well organized system of this kind must result in the desired object in

view, but the reliability and efficiency of the officers in charge of such work are absolutely necessary. Otherwise how could it have been possible - notwithstanding a so-called system of control - to export potato canker from Great Britain into America, if the Board of Agriculture's directions against this disease - against which special orders have been passed - would have been faithfully carried out, as it is no doubt the intention of the government .

In order to effect an efficient protection it is imperative that each country concentrate its efforts upon the thorough control of diseases within its own borders. Every country would certainly have to work out its own salvation along its own lines, and this you must grant is not a problem to be considered in the present address.

