These results indicated that the germ possessed no disease-producing power in the body of the chick, but when it gained access to the unabsorbed yolk, or yolk of the incubating egg, it always proved fatal, in all probability due to the elaboration of toxins, while growing in the yolk at such favorable temperatures.

Summarizing the results of this investigation, it was found that all eggs analyzed contained micro-organisms, even in the early stages of their development in the ovaries; that the particular micro-organism present in chicks dead in the shell was not found in any of the fresh eggs examined, but was constantly found in the unabsorbed yolk of all chicks that had failed to hatch, and all chicks that died shortly after hatching; that organisms pass through the shell during the process of hatching, and more readily through those in an incubator than those under the hen.

The question naturally arises: Why are the eggs under a setting hen not infected as well as those in an incubator? The only explanation that can be given is, that perhaps the body of the hen transmits to the egg shell an oily substance that fills the pores of the shell, preventing the entrance of the organisms to the egg content.

Again the question arises: Why did not such efficient fumigation of the incubator as was carried on during the experiment prevent mortality from the effects of this micro-organism? After fumigation, no living germs remained in the incubator, but, it must be borne in mind, that turning and airing the eggs every day was a means directly infecting the eggs by contaminated hands. As pores of the egg shells in an incubator remain unobstructed throughout the hatch, nothing would hinder the passage of these organisms to the egg content.

HORTICULTURE

World Requirements and Supplies of Timber

Wood is useful for so many purposes that it would be idle to attempt to enumerate them. The floors we tread, the seats we sit upon, the finishing of our houses, the newspapers we read, and a thousand and one conveniences come from the forest. And in spite of all the substitutes that have been found for wood the total quantity used is steadily increasing as well as the total per head of population.

The figures of consumption in Canada are not very reliable or complete, but taking the total of the last census, 1901, the product was about nine billion feet board measure and the annual consumption now is probably near to double that quantity. Of this quantity about four billion feet board measure was for sawing into lumber and therefore from trees of a size suitable for that purpose.

In the United States the consumption for the year 1907 was forty billion feet board measure of sawn lumber and the total of all forest products would bring the figures up to probably five times that amount. It is considered by the United States Forest Reserve that that country has reached its maximum of production and each year hereafter will see a decline, the deficiency resulting from which must be supplied elsewhere.

Europe as a whole is an importing continent. For the period from 1895 to 1899 the total net imports of European countries were 12,012,500,000 feet board measure, Great Britain leading with more than half and Germany coming second with over one-fourth. The total net exports were 11,347,500,000 feet board measure. Most of this was from Russia, Sweden, Austria-Hungary, Norway and Roumania. Russia was expected to increase its export and probably also Sweden, but the others were expected to decline. The net deficit in the European supply was at that time close to two billion feet and it is certainly now much greater.

If Canada is called on to supply any great share of this deficiency of the product in the United States and Europe — and there is no place else to look — how are we prepared to do it?

The quantity of pine estimated as standing in the Province of Ontario is twenty billion feet and in the Province of Quebec forty billion feet, the latter probably an over-estimate when compared with that of Ontario. The pine cut of the United States last year was 4,192,708,000 feet board measure. The pine cut of Michigan, Wisconsin and Minnesota in 1892 was eight billion feet board measure and is now two and a half billion feet. To make up even the shortage in the product of these States would mean that our supply of pine would last ten years.

Outside of yellow and white birch, maple and some red and burr oak, our hardwood supply is gone and would probably not total more than twenty billion feet board measure.

Of spruce, balsam and hemlock suitable for lumber we may have a stand of three hundred billion feet and the British Columbia forests of fir, cedar, spruce, pine and other western conifers have been put at 320,000,000,000 feet.

If the Dominion, including quantities exported, reaches even half of the production of the United States, the supply of trees for lumber is far from inexhaustible, and in fact the supply of virgin forest could not last much over fifty years, making no allowance for growth in the meantime.

There are large quantities of spruce, balsam, and poplar in the northern forests suitable for pulpwood but to what extent they can be saved from fire is uncertain. The distances are great and the lands not easily accessible. The species in question are easily injured by fire and in a dry year the present methods of handling the situation are inadequate.

Our great hope, however, for the immediate future is in the saving of the young trees now well established or half grown. If this is not done Canada cannot retain supremacy as a forest country.

—R. H. CAMPBELL, Superintendent of Forestry.

Forest Fires in 1908

The Forestry Branch of the Interior Department has issued an interesting bulletin dealing with the damage caused by forest fires in Canada in 1908. The bulletin, which was prepared by H. R. McMillan, assistant inspector of forest reserves, shows that during the year, 835 forest fires of serious proportions occurred in the Dominion, upward of 188,000 acres were burned over, causing the destruction of over fifty-six million feet of timber, valued, including mills and improvements, at $25,500,000. Twenty-one lives were lost as a result of the forest fires (all in British Columbia), and 2,404 were thrown out of employment.

The cost of the fires to the public was nearly three hundred thousand dollars. Quebec province headed the list with 250 fires, British Columbia came second with 235. In Quebec, however, the value of the timber destroyed was very slight. In British Columbia forty million feet were destroyed at a loss of $25,000,000, or over 90 per cent. of the total loss by fire in Canada.

The destruction by fire in Manitoba and Alberta was very light, out in Saskatchewan timber valued at over $20,000 was burned. The heavy loss in British Columbia was due to the great fire in the Crow's Nest Pass country, which destroyed Fernie and entailed a heavy loss of life. A fire on Vancouver Island, it is estimated, caused the destruction of 24,000,000 feet of timber.

Dealing more particularly with the prairie provinces, the report says: "That so few fires were reported from Manitoba, Saskatchewan and Alberta last summer is no indication that the northern timber belt in these provinces entirely escaped visitation of forest fires, as might be surmised from these reports, nor is it any guarantee in the future that they will be immune from fire The best efforts of the forestry branch have not been able so far to recover the northern timber with fire rangers so that all fires will be prevented, extinguished, or even reported. The immune areas through which the travellers may pass for a week without seeing a green tree, all bear witness to the fact that fires have always raged unchecked through the spruce and popular timber of Canada's northland. That the timber limits of Manitoba, Saskatchewan and Alberta are comparatively small and scattered, is due, not to any condition of the soil or climate which prevent the growth of timber, but to the recurring forest fires, which have destroyed the valuable spruce forests encouraged extensive reproduction of less valuable poplar or, in more serious cases. destroyed the forest growth."

Bulletin on Potatoes

The importance of the potato crop in Minnesota has been recognized in the Horticultural Division of the Minnesota Agricultural Experiment Station by the appointment nearly two years ago of A. R. Kohler, whose special study is the potato, and the greater share of whose time is devoted to this work.

Experimental work and study of the potato are being carried on along the following lines:

1. Improved methods of culture.
2. The quantity of potatoes to plant to the acre.
3. How to cut potatoes for planting.
4. How to control the potato beetle and other insects.
5. Whether it pays to spray potatoes for diseases with Bordeaux mixture or other fungicides.
6. Fertilizers for potatoes.
7. Potato breeding, which includes:

The production of new varieties with greater power of resistance to disease, greater yielding power and higher percentages of starch.

A study of factors that affect the crossing of potatoes.

Last winter Mr. Kohler published a bulletin on potato growing, No. 114, Parts I. and II. Part I. gives the results of as much of the experimental work as space would permit, and Part II. contains the most advanced ideas regarding potato growing for Minnesota. This bulletin, which may be had by applying to Mr. Kohler at the Experiment Station, should be of great value to the potato-grower if he will study it carefully and follow the principles set forth there.

FIELD NOTES

Paying for Good Roads

Among the important matters now demanding attention from members of the Legislative Assembly of Alberta is the question of building traffic roads in the Province. Many favor the proposition that dollar for dollar be paid by Federal Government, Provincial Government and municipality. It is urged that millions of acres of land have been turned over to induce railroads to come in to aid in settling the country, and that at least a fraction of that land could well be used to see that good roads are provided for the farmers to drive on.

A member of the Alberta Legislature, R. T. Telford, has announced his views in circular form and forwards a copy to "The Farmer's Advocate" for publication. Since good roads are a crying need in every farming community, we give Mr. Telford's letter in full. Someone may be able to suggest a more satisfactory scheme, but, in any event, care should be taken to see that good roads are provided and maintained.

Following is Mr. Telford's letter:

The road problem in Alberta at the present time is beyond all doubt the paramount issue of the day. When you consider that we have in this province over 7,000 townships of land, each having fifty-four miles of highway ready to be turnpiked into a traffic road-bed, you have at least formed a casual idea of the magnitude of the task of building roads in the Province.

Owing to the natural uniformity of the physical features of the Province throughout, and to its adaptability to farming of different kinds, thousands of settlers from all parts of the world are indiscriminately spreading over its entire 254,000 square miles of surface, and how these poor struggling pioneers are to be assisted in the building of suitable roads is a problem not yet touched by the genius mind of man.

Providence has endowed us with the fundamental material for the making out of Alberta the banner province of this Dominion, and it now behooves man to complete the superstructure, which can only be done by a systematic method of road construction.

As the life of the human body is sustained by the free and untrammeled circulation of blood through its veins and arteries, so must the life and vitality of this infant, though promising province, be kept up by the deepening of its water courses, which is concomitant with the building up of our highways.

While it may be truthfully claimed that Alberta is a Province blessed with innumerable resources, yet the Province is of a strictly agricultural character, and almost entirely dependent upon agricultural pursuits, and if we expect the tillers of the soil to build up the country, it is equally incumbent upon the remainder of us who share in the fruits of their toil, to also share in the burden of assisting them in getting over the roads with the products of their toil to the market centers.

Assuming that the foregoing is correct, and that the building of a system of traffic roads throughout the Province is essential to the welfare and development of the Province, and that we must have them, the question is, how to proceed, and who should assist in the building of these roads. Looking at the subject from a practical standpoint, it will take at least $1,500,000 annually to adequately meet the urgent and legitimate demands of the people as far as the building of roads and bridges is concerned. Combining the Local Improvement taxation with the provincial appropriation, approximately $1,000,000 a year has been spent during the last four years, and very little showing has been made.

As previously pointed out, the Local Improvement Districts and the Province are each expending about $500,000 a year on roads and bridges, and another half million is required. The question now resolves itself to the point as to who should contribute the remaining $500,000. I consider, that after scrutinizing this very knotty problem and weighing its various details with the utmost precision, the Federal Government, the Provincial Government and the proposed Muni-