The results for vegetables and feeding stuffs are given in the table below:

IODINE IN PLANTS

Feedstuffs	No. of samples	P.P.B. iodine av.
Soy-beans	48	224
Cow-peas	8	162
Oats and vetch	2	560
Vetch	6	418
Oats	44	219
Grass hay	28	150
Alfalfa	3	170
Lespedeza	1	150
Winter field pea	2	880
Clover	5	380
Johnson grass	1	350
Rye and vetch	3	429
Bermuda grass	1	100
Paspalum	1	150
Vegetables*		
Turnip, Extra Early Milan		19
Turnip roots, Early Milan		28
Lettuce		224
Lettuce		340
Lettuce, from greenhouse		54.3
Mustard		83.5
Mustard		391
Spinach		464
Spinach		100
Potato, sweet		108
Rice		44.8
Radish roots		14
Asparagus		6.7
English peas, shelled		6.04
English peas, hulls and vines		15.2
Cabbage		7.4
Cabbage		11.26
Turnip tops		66.5
Collards		94.0
Turnip, white		29.0
Turnip, rutabaga		96.0
Broccoli		68.4

* The results for the vegetables are calculated on the green sample.

IODINE IN WATER

Eight river waters in the state were analyzed, and they varied in iodine content from two to six parts per billion. The largest amount was found in the Enoree and Broad Rivers. These samples were taken in the upper part of the state.

The drinking waters, both raw and pure, from four of the largest cities in the state were analyzed. The results of the pure waters varied from 1.5 parts per billion to 3 parts per billion, while the raw waters ran from 4 to 5 parts per billion.

This loss occurs quite likely in the process of filtration whereby living organisms and organic matter which contain iodine are removed.

Two deep wells at Clemson gave from 1 to 4 parts per billion of iodine, while two spring waters varied from .5 to 2 parts per billion.

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A NEW DISEASE OF DOUGLAS FIR

DURING the fall of 1927 the writer, while engaged in scouting for larch canker, discovered a peculiarly abnormal condition of the Douglas fir, *Pseudotsuga taxifolia* (Lam.) Britt., located on a large private estate at Potowomut Neck, Warwick, Rhode Island. A considerable portion of this land originally was a sand barren, yet extensive plantings of white pine, red pine, Scotch pine, European larch and Douglas fir, together with many broad-leaf genera, have been made thereon and thousands of these trees are now in a fairly flourishing condition. This estate has been cited as one of the first as well as one of the most conspicuous examples of successful private reforestation in the east. It was donated recently to the State of Rhode Island as the Goddard Memorial Park and now constitutes a valuable part of the Metropolitan Park System.

It should be stated at the outset that Douglas fir is not indigenous to the east, although for many years it has been grown here with success as an ornamental. Its habitat is the forests of the Pacific Slope and the Rocky Mountains. In those regions it grows to enormous dimensions and constitutes one of our most valuable timber trees. Three main varieties are recognized and are known respectively as the Pacific Slope, the Northern Rocky Mountain and the Central and Southern Rocky Mountain forms.[1] The Douglas fir in the Goddard Memorial Park is apparently of the last variety. Records seem to indicate that it was grown from seed collected in Colorado. The statement has been made that the original shipment of Douglas firs to this estate

[1] George B. Sudworth. "Check List of the Forest Trees of the United States. Their Names and Ranges." U. S. D. A. Misc. circular 92, p. 28, 1927. There has long been belief among European botanists that our Douglas fir represents at least two distinct species, one ranging through the Pacific Slope region and eastward into the northern Rocky Mountain region, the other being found roughly in the central and southern Rockies. Augustine Henry and Margaret G. Flood (in Proc. Royal Irish Acad., vol. 35, sect. B; 62–99, pl. 12–14, 1920) propose to designate the Pacific Slope form as "Pseudotsuga Douglasii Carriere," and the northern Rocky Mountain form as "P. Douglasii var. caesia Schwerin"; while for the central and southern Rocky Mountains form they propose the name "P. glauca Mayr."

was the first shipment of any Douglas firs to this part of the country. Thousands of these trees from three to twelve inches or more in diameter, breast high, are to be found in this park. Those less than five inches in diameter are, for the most part, growing in pure stands and are set from four to six feet apart. The larger specimens, ranging from thirty-five to forty-five years of age, are border trees or exist in ornamental groups.

The abnormal condition referred to is conspicuous upon the older Douglas firs, and in certain portions of the park the number affected may exceed 90 per cent. Trees five inches and less in diameter, with few exceptions, exhibit little evidence of disease. So conspicuous are some of the abnormal trees that even to the untrained observer they stand out prominently from the other trees in the immediate vicinity. Among the more spectacular symptoms indicative of disease may be mentioned the pronounced resinosis. This may be exceedingly extensive and involve the lower ten to fifteen feet of the main trunk. In a number of instances observed the trunks are fairly bathed in the dry, grayish-white, glistening pitch. This pitch sometimes drips from the upper parts and hangs to the lower branches in bead-like drops or in stalactitic manner. In extreme cases, it may even flow out over the ground for a foot or more from the base of the tree. Pitch pockets may occur beneath the bark of the lower portions of the trunk and apparently may involve a considerable area of abnormal contributory tissue. Such pockets sometimes contain a half-pint or more of liquid resin. By cutting into these pockets and pressing upon the loosened bark below, one may cause the resin to exude copiously. Trunk swellings or hypertrophies may be present and give to the lower part of the tree a decidedly gouty appearance. Smaller hypertrophies often occur at the nodes on the branches, particularly the lower branches. A few of them resemble in form those sometimes observed upon coast white cedar, *Chamaecyparis thyoides* (L.) B.S.P., and known to be caused by a rust, *Gymnosporangium ellisii* (Berk.) Farl. In certain instances these swellings follow along the branch in bead-like arrangement. A close examination of the hypertrophies discloses oftentimes an exudation of pitch, though in relatively small amount as compared with the trunk exudations. Associated with the swellings are to be found, in most cases, tiny white to tawny, cup-shaped apothecia. The spore-bearing or hymenial surfaces are located inside the apothecia and are of a golden yellow to orange color. After a few days of warm rain the apothecia open and reveal these hymenial surfaces. During dry weather, however, due to the inrolling of the rims the cups become nearly closed. From a study of the morphological characters of the fungus it has been determined as a *Dasyscypha*.

It is rather significant that these fructifications occur chiefly upon the hypertrophies and not to any great extent upon the normal bark. A microscopic examination of sections from the hypertrophies of living branches discloses an abnormal number of layers of bark. Apparently they were formed as a result of the excessive activity of the phellogen. Many cell layers of the periderm are found to be penetrated by fungous hyphae. Whether or not the fungus is directly responsible for the abnormal activity of the phellogen is a point which is being investigated at the present time. The true cambium appears to be stimulated proportionally to a much smaller degree and produces relatively small amounts of abnormal woody tissue. Furthermore, entomologists agree that insects are not responsible for the damage. It is quite evident, then, that we have to deal here with a serious disease. Sorauer[2] observed resinosis which, in his opinion, arose "autogenously without wound stimulus" in the case of seedling pines "from heavily manured nurseries," as well as "in older plants of *Pseudotsuga Douglasii, Abies Fraseri* and *Abies concolor*" growing "on moist marshy soil which had been heavily manured at intervals of two or three years." The soil at the Goddard Memorial Park is decidedly dry and sandy and, so far as known, has never been heavily manured. The weight of evidence in this case, then, is in favor of a reaction to a wound stimulus as the more probable explanation.

In conclusion it may be stated that the condition of the Douglas firs at Potowomut bears a striking resemblance to that noticeable on many of the Douglas firs at the Matthews Arboretum and the Palmer estate located at Hamilton and Ipswich, Massachusetts, respectively. The trees at the Massachusetts estates have been carefully studied in connection with the larch canker caused by the fungus, *Dasyscypha Willkommii* (Hartig) Schröter. New stations have been discovered in several other Massachusetts towns and the disease apparently is more wide spread than was formerly thought probable. It appears to be a serious menace to the growing of Douglas fir in this part of the country at least. How seriously it may threaten the Douglas fir forests of the west remains for further investigation to determine.

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[2] Paul Sorauer, "Manual of Plant Diseases," third edition, volume I, translated by Frances Dorrance, page 715–716. 1914.