

the form of stable manure, and crop his land as much as possible.

Discussion drifted to disease and insect pests, club root in cabbage coming in for a good share of attention. This disease of the roots of cabbage, on which lumps or bunches grow, sometimes to the size of the fist, is most prevalent on land on which cabbages have been grown continuously for years, but will spread by infection until it is serious indeed. Rotation of crops, a process sometimes difficult for the gardener, was the only remedy proposed. The fact that generally it was the weakest plants that were attacked by insects or disease was brought out, and the inducing of rapid, vigorous growth as a preventive emphasized, one speaker going so far as to say that cabbages could be made to grow so fast that the worms could not hurt them. One member, however, took exception vigorously to the general statement that insects attacked the weakest specimens only, stating that if you had an extra large head of cabbage or celery there you would find the most snails. Snails, he said, were said to be slow, but they were too quick for gradeners, and he didn't know how to check them. No one appeared able to tell him, though later in the meeting poisoned bran was suggested as a possible remedy. Some thought that toads and frogs, which ought to be encouraged for other reasons, might be useful against snails or slugs. Skunks, said one, were amongst the best friends of the market gardener, and should never be killed. Examine the excrement of skunks and you will find remains of grasshoppers, crickets and other insects. He was positive that they cleaned off the tomato worm, and that they materially helped in keeping down the number of crickets, which, by eating little holes in ripe tomatoes, wrought great damage. You have all seen, said he, holes in the ground around tomato vines; these are dug by skunks as pitfalls for crickets, and in the night Mr. Skunk comes round and cleans them out. Several assented to having noticed the holes, but with no idea as to their purpose or by whom made.

Comment was made upon the appearance and disappearance of insect pests in cycles, illustrated by the fact that the tomato worm and the black squash bug had been almost unknown for two seasons.

The next speaker was introduced with the remark that the vegetable growers felt that in the experiments conducted at Guelph very little attention had been paid to their interests. Prof. Harrison, of the O. A. C., Guelph, admitted that there was a good deal of force in the complaint. The problems with respect to vegetables that they had dealt with had been mostly canners' problems. He had, for instance, been called in to advise as to how to prevent the souring of tomato pulp, of which canners accumulated quite a stock before the canning season was over, and which they afterwards used in the manufacture of catsup. How to prevent the spoiling cans, shown by their having swelled ends, was another of the problems. He had seen in one instance a pile of cans as large as the hall and eight feet high, all spoiled. They had, however, made some investigations with regard to diseases of vegetables. The soft rot of cauliflower, cabbage and celery, of which there was much complaint the past season, was a bacterial disease, and spraying with Bordeaux was of no use, as the bacteria were not on the outside, but the inside of the plant. The remedy largely lay in the nature of prevention. Choose varieties resistant to the disease. Rotate crops every year. Do not throw diseased vegetables on the manure heap, as by this means when the manure is spread the ground itself becomes infected. The bacteria of these diseases are always present, but very often do little harm, unless conditions are favorable. Rot of celery after it is stored is always aggravated by moisture, and especially by heat. The rot in growing celery, which appeared recently, is of bacterial origin, also. In conclusion, Prof. Harrison invited every one to send to the College for examination specimens affected with unknown diseases or insects, and they would do what they could to help.

Mr. H. S. Peart, assistant to Prof. Hutt at the College, gave as a reason why more extensive experiments were not conducted there with garden vegetables, that the soil at the farm was not a strictly vegetable soil, and also that the climate was so much cooler than at most other points that many vegetables, such as tomatoes, would not mature. He was in favor of experimental work in garden stuff conducted at some of the fruit experiment stations.

Prof. Macoun, Horticulturist at the Ottawa Farm, was asked to state his experience in combating cabbage and cauliflower maggot. He said that a piece of paper placed flat and fitting snugly around a newly-set plant, so as to hinder the maggot fly (which so much resembled a housefly) from laying her eggs in the ground close to the plant, was a perfect preventive. Cheese-cloth enclosures will keep the fly from troubling the beds of young plants. He spoke highly, also, of such enclosures as a means of producing earlier and crisper radishes and lettuce.

On Thursday the attendance was much better.

Prof. Shutt, of Ottawa, read a paper prepared by Prof. Harcourt, of Guelph, on "Fertilizers for the Vegetable-grower." Reference was made to the quaint and erroneous ideas regarding soil and plant growth that prevailed down to the end of the eighteenth century. Early investigators were, no doubt, wide of the truth, but with all the knowledge that has of late been applied, the end is not in sight. The soil is not only a storehouse of plant food, but it is also a busy and complex laboratory where, it may be said, plant food is digested. Many factors enter into the problem of best fertilizers to apply. Soils differ; all are not equally retentive of moisture. In one respect they are alike, however—all need humus in abundance. Plants also differ. It may be laid down as a general principle in fertilizing that the greater the range of root, the less need of the ash constituents of manure. Root crops need a plentiful supply of phosphates. Sugar beets, whose value is determined by their sugar content, and this in part by their ripeness, should be so manured as to grow rapidly at first and more slowly towards the end of the season. Vegetables which are sold in the immature stage—lettuce, for instance—in which the object is to have a rapid and abundant growth of leaf, should be liberally supplied with nitrogen. For fruit trees, on the contrary, nitrogen should not be applied directly, but through the agency of the legumes. Potash and other ash constituents are the most valuable fertilizers for fruits, as they contribute to the filling up and ripening process. For worn-out soils, he would say, use all the farmyard manure, and supplement with cheaper grades of commercial fertilizers. Catch crops are useful in preventing leaching. In conclusion, he would say, that only in conjunction with most thorough cultivation will the use of commercial fertilizers prove profitable. To this, in discussion, Prof. Shutt added that land should be already rich before their use would pay. He also warned his hearers against being deceived by the names given by manufacturers to their products, such as potato manure, onion manure, and the like. Many had been gulled by these names into buying what was not specially useful. Artificial fertilizers should be used as an adjunct, rather than main source of plant food. Some fertilizers are very soluble. Nitrate of soda is as soluble as sugar or salt, and if applied in the fall is lost. Such manures should be used only when immediate use can be made of them. Question—"How should such manures be applied? On the surface, or plowed under?" They should be sown on the surface and lightly harrowed in. He believed that there would be a return to the moderate use of lime, which for a time has been in disfavor. It would be a corrective for acid soils.

The "Growing of Early Vegetables" was the subject of an able and practical address by J. L. Hilborn, of Leamington. Unlike the majority of those present, he did not take his stuff directly to the city; his was altogether a shipping trade, sent mostly by express. His bill for getting his products taken to market, was \$1,400 a year. He confined his attention chiefly to cucumbers, tomatoes and melons. Speaking first on cucumbers, he said he used only two varieties—Arlington White Spine and Burpee's Early White Spine. They were grown outdoors, but were started early in March in flats in the greenhouse. He transplanted at least twice before setting out, the last time into pots or boxes. For speed in picking out he used an implement something like the head of a rake, with teeth larger than rake teeth, to make holes. Did not have more than a depth of three inches of earth in his flats, as he had discovered by accident that it was better than deeper. He watered only when soil had got fairly dry, and then liberally; did not believe in keeping plants drenched. Had a wind-break on north and west sides of one field—a tight board fence—and was building another, as it had paid. In his opinion it was as good as being moved 100 miles farther south.

Tomatoes were started about first of March, also in shallow flats. Replanted three or four times, as the oftener they were moved (unless they were not checked) the better, plants becoming more stocky. For early use, planted Earliana and Atlantic Prize. He grew seven acres of early tomatoes, and six acres of late.

Melons were also started in greenhouse, and in the early, treated much in the same fashion as the others. They were planted in the field, two plants in a hill, in rows, the spaces being six and eight feet, alternately, for convenience in spraying, the wide space allowing room for a spray wagon to be driven. The melon aphid, which is found wherever melons have been grown largely for any length of time, was described as a dreadful pest. Its multiplication is enormously rapid. They start in single hills here and there over the field, and if well established, will cover a five-acre field in a week. His only remedy was to start in time and with straw burn up affected plants. Last season, in a field of six acres, he had to destroy about one eighth of an acre of plants altogether, but he saved the rest of the crop.

Experiments in Potato growing, was the

subject taken up by Prof. C. A. Zavitz, well known as a careful and enthusiastic experimentalist. Experimenting with early potatoes, it was found that when dug at nine weeks from planting, Early Andes yielded 174 bushels per acre, Early Fortune 170, Six Weeks 169, while Burpee's Extra Early, an old standard variety, yielded only 113 bushels per acre. Some of the audience wanted figures respecting Early Ohio, which is practically the only early potato grown around Toronto. Prof. Zavitz had not had that variety under trial for a few years, but it had not proved equal to some others in former trials. It was contended by some present that it excelled all other kinds, being early, of good size, easily dug, and of high quality. In liability to rot, varieties differed greatly, the proportion of rot ranging from 3 per cent. to 58 per cent. of total crop. Holborn Abundance took first place. It is a very late potato, a good yielder, but not of first-rate quality. Stray Beauty had only 5 per cent. rot, Empire State 29 per cent., Rural New Yorker 35 per cent., Beauty of Hebron 56 per cent. As to changing seed, Prof. Zavitz gave figures showing that, with careful selection each year, yields have increased steadily instead of decreasing, as most people expect. An instance was cited by one present of a gardener who had planted his own Early Ohio seed for nearly thirty years, and brought in still to Hamilton market the best potatoes of that variety that were seen there. Prof. Macoun, while agreeing in the main with what was said, had found notable exceptions, in one case a change in seed resulting in an increase of 100 bushels per acre, and the second year 90 bushels. In regard to using large versus small, or medium-sized potatoes for seed, it was found that, without exception, seed from large potatoes gave greatest yields. Drills 28 to 30 inches apart, with sets of at least two ounces in weight, each planted 12 to 14 inches apart in the drill, were recommended as preferable to hill planting, or to other widths and distances. Mr. Hilborn found whole seed gave earliest crop. Seed potatoes should be planted the same day as cut. In every case seed cut a few days before planting gave lessened yields. It was found that seed potatoes spread out on barn floor three weeks before planting gave greater yield than those kept in either dark or light cellar. Removing sprouts before planting invariably lessened yield. At Guelph they had not been able by spraying with Bordeaux mixture to prevent all rot, though spraying was certainly beneficial. Prof. Macoun said that at Ottawa spraying thoroughly had resulted in lengthening the time of growth three weeks and increasing the yield ninety bushels per acre.

Prof. W. Lochhead, of the O. A. C., not being present, the subject assigned to him, "Injurious Insects and Fungous Diseases of Garden Crops," was taken up by Mr. T. D. Jarvis. He dealt principally with potato rot, cabbage worm, for which spraying with weak solution of Paris green was recommended; snail or slug, for which lime was a preventive; and aphids, to be combated with kerosene emulsion.

Prof. Macoun had found that for cutworms, and he expected it would answer for slugs also, the very best and a most effectual remedy was poisoned bran sprinkled about the plants. Mix 40 or 50 pounds of bran with one pound of Paris green, and sprinkle by means of a bag with a pipe inserted at the mouth.

"The Cauliflower, Growth, Packing and Marketing," was the subject of a paper by Mr. A. McMeans, of Brantford.

At this stage there was a diversion, not perceived by most of the audience, when the Directors called Mr. H. B. Cowan, Sec.-Treas., aside, and in recognition of his labors on behalf of the Association, presented him with a gold-handled umbrella. Mr. Cowan, though taken by surprise, made a suitable reply.

Prof. Macoun gave a list of the best varieties of vegetables, the result of repeated and thorough experiments conducted at the Ottawa Experimental Farm. The conclusions reached there do not coincide in all particulars with those reached at Guelph, but in the main they do, and much valuable information is contained in the lists issued at both places.

Prof. Macoun impressed those present as being a careful investigator, with good judgment and common sense, whose opinions are entitled to every respect. We may find it advisable in the near future to publish in full his list of the best vegetables.

Exactly.

Please accept my thanks for the knife I received from you. I find it exactly as advertised.
Bence Co., Ont. JOSEPH L. SCHURTER.

By a typographical oversight, the paragraph crediting the cuts of the President, Vice-President and Secretary of the Ontario Beekeepers' Association to the Canadian Bee Journal, from whom they were loaned, was omitted from last issue.