

Pears were a more abundant crop, and consequently we had more in proportion to the number of prizes offered, than of Plums; yet strange to say, one of the most common varieties of Summer Pears, and one also that was just in season, the "Burbidge" was not on Exhibition.—Twenty-six of the thirty-five prizes offered were awarded, and eight gratuities granted by the Council.

For Apples and Crabs there were some fifty-six prizes offered; of these thirty-two were competed for, and sixteen gratuities granted for sorts not coming within the list for which prizes were offered.

The collections of Garden Vegetables were considered very good for the season, and seemed to attract a great deal of attention. There were six competitors for the four prizes offered. The first prize collection contained twenty-four separate varieties of vegetables, and the second about thirty.

Plants and Flowers.—The greatest amount of interest appeared to centre around the Flower stands, and the Association may well be congratulated on the success attending its first attempt at a Floral display. We hope it may not be the last, but that at each succeeding year the newly awakened interest in Floriculture may be so fostered and encouraged that every home throughout our country may be beautified, and its occupants made happier and better, in enjoying the luxury of possessing and cultivating those, the most beautiful of all the gifts of our Almighty Father.

In this class there were forty-five prizes offered. Twenty-four of these were competed for and awarded, and three gratuities granted by the Council for single bouquets of flowers that had received honorable mention from the judges. The Council also awarded gratuities for a dish of very fine Peaches "Royal George," grown in a cold house, and for an exhibit of Grapes in pots.

ROTATION OF CROPS.

Having disposed of the prominent points that have recently been brought forward in connection with the rotation of crops—we shall now proceed to consider more fully the scientific bearings of the subject, and the conditions which should regulate the farmer's practice on this important subject.

Our previous article was concluded by some remarks on vegetable nutrition, and by a statement of the inorganic constituents of plants, to which reference may be made. In addition to what was then stated, we find that some plants require certain inorganic matters in larger quantities than others, and it is upon the knowledge of this circumstance that the rotation of crops is founded. The soil is certainly losing inorganic matters. Oats contain 4 per cent. of ashes, hay 3 per cent. A ton of English hay is said to remove 180 lbs. of ashes, and these ashes are the very substances required by another ton of hay.

By constantly cultivating the same crop, we deprive the soil, to the depth of which the roots extend, of certain materials, while others are left nearly untouched; but by alternation of crops, the latter may be made available for the purpose of growth. Farmers on this account have different crops succeeding each other in the same field. Wheat, barley and oats, are described as silica plants, pease, beans, and clover, as lime plants; turnips and potatoes as potash plants. These crops, from the difference in their predominant inorganic ingredients, are made to alternate with each other. The three rotations most commonly followed in Scotland are the four-course shift, or what is known, as the Norfolk system, the five-course and the six-course. The four-course shift usually consists of 1st year, turnips; 2. wheat and barely, and in many cases wholly barley; 3, grass; 4, oats. The five-course is formed, simply allowing the grass to remain for two years; while the six-course shift, or system of rotation, consists of—1, turnips; 2, wheat and barley; 3, clover; 4, oats; 5, beans or potatoes; 6, wheat. The system of rotation, in other words the number of years over which it extends, varies in different countries.

In some virgin soils, rich in phosphates and other inorganic matters, the same plants may be cultivated successfully for many years. This occurred in Virginia, where, for 100 years, the same crops were grown without manure; but ultimately exhaustion took place, and the crops became deficient. On lava soils there are often good crops. Thus the soils of Vesuvius, formed by disintegrated lava produce excellent crops for many years in succession. It must be remarked, however, that frequently important materials exist in the soil in an insoluble state, and that unless means are taken to render them soluble the plant cannot avail itself of them. A soil thus considered as comparatively barren, may in reality have abundant materials of fertility in its composition.

There are few cases, says Sir John Sinclair, where the same land will constantly yield one and the same plant, or where a repetition of the same crop, or indeed of the same species of grain, without some interval, is yet found to be injurious. Hemp is one exception to that general rule; for in Russia, the same grain invariably produces it, without either fallow or any mixture of crops, but in consequence of great quantities of putrescent manure being annually applied. It appears from Mr. Butterworth's experiments that, carrots have been successfully cultivated for seven years, on the same ground. In some instances, Bear or Big has been sown for years on the same ground in succession. But in general, a change, or rotation of crops has been found not only expedient but necessary. Indeed every farmer who conducts his own operations on rational principles, will be attentive to such a change.

In theory, there is certainly no absolute necessity for alternation of crops, when dung and labour can be readily procured. (Vide Bousingault's "Economie Rurale," p. 452 et seq.) But, says the Chemist Farmer of Bechelbronne, "there are nevertheless certain plants which cannot be reproduced upon the same soil advantageously except at intervals more or less remote. The cause of this exigence on the part of certain vegetables is still obscure, and the hypothesis for clearing it up far from satisfactory." P. 450.

Without following out the subject more

fully in its chemical ramifications, we shall proceed to discuss its practical details. It has been pointed out by Sir John Sinclair that the propriety of adopting any particular rotation must depend on a variety of circumstances, more especially the following; 1. On the climate, whether it is wet or dry, wet climates for instance being favourable to the production of oats, dry climates for peas, and for the harvesting of beans; and the rotation to be adopted in each climate ought to be formed accordingly; 2, on the soil: for clay, loam, or sand, have each various crops best calculated for them; 3, a rotation must also depend upon the situation of a farm, in regard to the probable sale of its productions, for instance a field of Potatoes near a great town would realize a much larger sum than one of the same size would realize in a remote part of the country; 4, on the means of improvement by extra manure, as lime, marl, sea-ware, town dung &c.—"The celebrated Dunbar rotation of, 1. Turnips; 2, Wheat; 3, Clover; and 4, Wheat, could not according to Sir John, have been possibly carried on without the command of sea-ware, which that neighbourhood possesses; and, 5, the rotation must also depend on the state or condition of the soil, whether it be old cultivated land, or a new improvement: whether it be land which has been cropped judiciously or by exhausting management; whether it is in good heart, or the reverse, whether it is foul or clean.

The Historian of Scottish Husbandry has laid down certain maxims, which have been recommended as the best calculated to lay the foundations of judicious systems of rotation.

1. A farmer must have more than one kind of crop upon his farm; indeed he could not otherwise carry on his business. For instance if he had nothing but wheat, he might not be able to procure hay and oats, and so on. By having various articles, also, he does not run so much risk, either in regard to the season, or to the sale of produce afterwards. Besides if a farmer were to cultivate but one crop, he might often be materially affected by one unfavourable season; or, if the article which he raised was not unsaleable, the land had better have remained unploughed.

2. To have the crops so arranged, that the labour of ploughing for each, of sowing, weeding, reaping, &c., shall proceed in a regular succession, and that the labour or business be not too much crowded on the farmer at any one season of the year, nor any quantity of extra stock rendered necessary; but that the crops produced on the farm, shall be cultivated by the same hands, and with the same cattle. To this general rule, hand-hoers in spring and summer, and reapers in autumn must form an exception.

3. To avoid forcing crops, or frequent repetitions of the same articles or species; as a diminution both in quantity and quality, except in very rare instances, never fails to be the consequence. By frequent repetition of the same crops (as we have already observed on the authority of Bousingault and others) the soil loses stamina, which neither manure nor cultivation can remove, and it is also to be kept in view that great luxuriance in vegetation can be made to take place without much real productiveness as we see where grain is sown on the sites of dunghills.

4. To avoid two white crops in succession, but alternately to have white and green crops. On this head it is contended, that it is impos-