Flagellatæ, Dinoflagellatæ and the *Silicoflagellatæ*, which never had any good right to be included among plants. These are the things which are happily characterized by Dr. Thaxter in a recent article in the *Botanical Gazette*, as 'a menagerie of organisms whose zoology is orthodox to a degree.'

Why the botanists should be bothered with all these 'beasts' (as Dr. Gray would have called them) is a puzzle which has not yet been satisfactorily solved. Whether the purging of the membership of the plant kingdom should go further and result in the expulsion of *Volvox* and its near allies is difficult to decide. In everything but its color *Volvox* is an animal—and a very good one at that—but whether its assumption of its green coat is sufficient to hide its essentially animal nature in other respects is, perhaps, open to argument, especially since it is such a pretty and interesting organism for laboratory demonstrations. While we should like to retain it, we are compelled to say that in all probability it is to be relegated to Dr. Gray's domain of 'beasts.'

A FLORA OF PENNSYLVANIA.

Nearly seventy years ago Dr. Thomas C. Porter began the collection and study of the plants of Pennsylvania, and until his death in 1901 he continued the work practically without interruption. At his death his manuscript was found to be essentially completed, needing only the editorial supervision of some one familiar with his ideas. Such an editor was found in Dr. J. K. Small, of the New York Botanical Garden, under whose direction the 'Flora of Pennsylvania' was brought out by Ginn, the Boston publisher. It is a synoptical flora, all descriptions of orders, families, genera and species being included in carefully made keys. Especial attention is given to habitat and distribution, and in this particular this is one of the most satisfactory floras ever published in this country.

The book contains about three hundred pages, exclusive of the very full indexes. It deals with the spermatophytes only, the ferns not being included, so that the word 'flora' is strictly proper as applied to the book. It includes 2,201 species, representing 655 genera, 156 families and 43 orders. It is a great and enduring monument to the industry and ability of the author.

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*AGRICULTURE IN JAPAN.**

Only 14,995,272 acres, or 15.7 per cent. of the whole area of Japan, exclusive of Formosa, consists of arable land, and 55 per cent. of the agricultural families cultivate less than 2 acres each; 30 per cent. cultivate 2 acres or more up to 1½ cho, or a little less than 3¾ acres, leaving 15 per cent. of the farmers who cultivate farms of 3¾ acres or more. A comparison of the whole area under cultivation with the number of farm workers shows that, on an average, one man cares for a little less than an acre.

The government has attempted to aid the progress of agriculture by laws respecting irrigation, the protection of forests so as to control the flow of rivers in the interest of the farmer, the formation of farmers' guilds, the rearrangement of farm boundaries, and the improvement of drainage systems. Small as the farms are, their parts are usually separated so that a farm of 2 acres may consist of several nonadjacent lots, the average size of a lot being about one eighth of an acre. A law which went into force in 1900 provides for the rearrangement of boundaries by farmers exchanging fields for those owned by others so as to make the farms more compact and enlarge the fields to permit the use of horses and machinery, at the same time increasing the tillable area by straightening some boundaries and removing others. About 20,000 acres have already come under the operation of this law.

For the purpose of further promoting agricultural interests the government maintains a State experimental farm and nine branch farms. The work at these farms is largely theoretical, and is divided into eight departments, viz., seed, saplings, agricultural chem-

* Consular report from United States Consul-General Bellows, Yokohama, Japan.

istry, entomology, vegetable physiology, tobacco, horticulture, and general affairs. The results of the investigations are submitted to thirty-eight experimental farms, created and carried on by the provinces with the help of a subsidy from the general government, and theories are here subjected to the test of practical application before general publication. Among the results already accomplished by this method are improvement in the quality and quantity of crops through more careful selection of seeds and better understanding of the varieties suited to the conditions in different localities; more efficient modes of destroying injurious insects; ability to minimize the injury from plant diseases, such as smut, mildew, pear cluster-cups, etc.; increased skill in the application of fertilizers, and the discovery of indigenous grasses suitable for meadows, all meadow grasses having formerly been imported.

The general government aids the local treasuries to maintain six local agricultural schools for the instruction of farmers' sons in the general principles of agriculture, surveying, veterinary science, and related subjects. The government also carries on an experimental tea farm, on which is a curing workshop; a laboratory for investigating the disease of cattle and poultry; a cattle-breeding pasture for improving the native breeds of cattle for meat and dairy purposes, and two horse-breeding pastures for promoting the introduction of better horses.

Efforts have been made to introduce sheep raising and swine raising, but with only partial success. It is claimed that the conditions of climate and food supply present no serious obstacle to the success of sheep farming, but the statistics of 1901 showed only 2,545 sheep in the country. Swine raising has succeeded better, but can not yet be spoken of as an established industry of much importance, the number of swine having remained in the vicinity of 200,000 for several years.

The principal agricultural products, named in the order of their acreage, are rice, rye, barley, wheat, beans, mulberries, sweet potatoes, millet, buckwheat, rape, red beans, Italian millet, tea, indigo leaves, potatoes, sorghum, tobacco leaves, cotton and hemp. The area devoted to rice cultivation constitutes a little more than two fifths of the total area of arable land. The greater part of the rice fields are in low-lying land, which can be easily flooded, but some upland rice is raised. Mulberry trees and tea plants are usually planted on land not suitable for more important crops, such as the slopes of hills, sandy dunes, and similar places. In the warmer parts of the Empire barley and rape are often raised as a second crop after rice has been harvested, but farther north the excess of moisture required for rice leaves the land too cold for another crop the same year.

Stock raising is still in its infancy in Japan, and is not likely to become an important industry, owing to the high price of land and the coarseness of the native grasses, most of which are not fit for food for cattle or horses. Oats and maize as foods for farm animals are practically unknown, and what passes for hay is a kind of straw, which is chopped fine before it is fed to horses. A little less than one sixth of the arable land consists of plains and pastures, and of this about two fifths belong to the state and the imperial household, the remainder being owned by private stock raisers, who raise stock principally for tillage and draft animals. The natives are not accustomed to the use of butter or milk, and do not usually like the taste of them, and their religious prejudices have hitherto prevented the general use of meat of any kind, although they now seem to be developing a taste for all these kinds of food.

Farmers do not engage in poultry raising to a sufficient extent to provide the eggs needed for home consumption, these being imported from China to the value of over $500,000 per year. Fruit raising, under the stimulus of government encouragement, has advanced considerably, but is not yet an important branch of farming in this country. Bee culture is engaged in to a limited extent, but the industry is still in a primitive condition.

THE URBAN AND RURAL POPULATION OF GREAT BRITAIN.

THE general report of the census of Great Britain of 1901 has recently been issued. In