BOTANY :

THE study of algæ did not receive for a long time the attention due to it from Indian botanists. One main reason for its neglect is the general impression that a study of this group of plants can hardly be of any economic value. So, while Mycology, Plant-Breeding and Plant-Physiology are drawing most of our men, subjects like Algæ which are supposed to be of academic interest only fail to attract any of them. It is gratifying to see, however, that of recent years more people are taking to the study of algæ. An attempt is made in this address to show among other things how a study of algæ, besides throwing valuable light on fundamental biological problems, can also be of value economically.

It is generally believed that life first originated in water and that the first living organism must have been of an algal type. And a detailed study of these plants will throw light on the problem of the origin of life, the solution of which is the ultimate goal of all biologists. Again a study of this group will enable us to understand many biological principles such as division of labour, parallelism in evolution, the phenomena of differentiation of somatic and reproductive cells, origin of sex, alternation of generations, adaptation to land life, etc. And the structure, function and origin of cellular bodies like the nucleus, plastids, pyrenoids, blepharoplasts, chondriosomes and golgi bodies are more likely to be understood by a careful study of this group of plants than of any other.

The different systems of classification of algæ are briefly dealt with, particular emphasis being laid on the flagellate origin of algæ, the main differences between the *Isokontæ* and the *Heterokontæ*, the parallel evolution seen in both these two groups and the existence of "flagellate" and "algal" forms in all the main algal groups. Reference is made to the works of several algologists on these simplest types of algæ and the desirability of work being done in India on similar lines is emphasized.

The work done on the ecology of algæ by several workers like West and Pearsall, Naumann, Fritsch, Donat and others is briefly described. Among other points, the ecology of freshwater lakes as described by these authors is explained in some detail. The classification of lakes as under Oligotrophic, Eutrophic and Dystrophic ones is explained and the effects of various factors such as the depth and form of the lake, the sediment, the hydrogen-ion concentration, the surroundings of the lake, etc., on the nature and composition of the algal population are described.

The ecology of subærial algæ is next described and an account is given of the important role these algæ play in colonising new and inhospitable strata, which are thereby rendered more habitable for higher plants. The need for research work on the ecology of algæ in India is pointed out.

The possible lines of work on the cytology of algæ in India are referred to, particular emphasis being laid on the possible presence of structures similar to Golgi bodies and mitochondria in algal cells.

Lastly, the economical aspects of the study of algæ are dealt with in some detail. The value of algæ on the growth of fishes is briefly explained. The algæ form the food of minute animals, which in their turn form the food of larger animals, which in their turn again serve as food for fishes, so that possibility of fish-life in any area is ultimately dependent on the presence of these minute lowly plant organisms. Investigations on the algal population and the various physical and chemical features which control their growth will help to control the nature and extent of the fish-population in any area.

The need for the establishment of freshwater biological stations for investigating hydro-biological problems in India as has been done in other countries is pointed out.

The study of algæ in relation to agriculture is next dealt with and the importance of determining whether the algæ growing on cultivated soils are beneficial or harmful to the crops is pointed out.

Many scientists have adduced evidence to suggest that the algæ are able to fix the free atmospheric nitrogen. If this should prove to be true, the growth of the algæ must be encouraged on the fields.

The study of algæ is necessary in connection with town water supplies. In the reservoirs there is usually a fair amount of algal growth. The physical and chemical conditions of the water in the tanks and the nature of the algal population should be studied, and, when necessary, measures should be taken to check or altogether eliminate the growth of the algæ in order to ensure a pure water supply.

Many mosquito larvæ depend on algæ for their food and hence there is a possibility of checking the growth of the larvæ by controlling the growth of the algæ. It is reported that mosquito larvæ do not flourish in waters in which *Characeæ* are growing. If this should prove to be correct, then we have another method of getting rid of the larvæ.

Algæ are used as manure in Rajaputana, as they are very rich in nitrogenous material. It is not known whether they are used for a similar purpose in other parts of India. Characeous deposits are used as manure in Switzerland. Moreover, the peculiar odour emitted by them is said to help in keeping the soil free from insects.

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