

THE UTILITY OF A BIOLOGICAL STATION ON THE FLORIDA COAST IN ITS RELATION TO THE COMMERCIAL FISHERIES.

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There seems to be considerable disposition of late years on the part of some individuals and institutions of learning to establish biological stations in different parts of the world. Some of these stations are permanent, others only temporary; none, I believe, on our own coast are open during the entire year. They are largely established to supplement biological study in our colleges and universities and to facilitate and promote original research. In none except the Woods Hole Government Station are there any special attempts to solve problems of economic importance.

The scientific work done in these is fragmentary in character. Each investigator continues his particular line of work, with no special reference to its bearing on other problems. The investigator's mind is not troubled as to whether or not the results of his studies will give to anyone the means of securing wealth or be of economic importance to the general public. He is solving, so far as his ability and facilities will permit, some purely scientific problem, without any special interest as to what practical use may be made of its solution.

In our own country, and in this so-called practical age, there is always an attempt to make some practical use of every discovery. The brains of our inventive genius are strained to their utmost to turn new facts into common use; to make scientific discoveries things of commercial utility. In Franklin's time no one ever dreamed that electricity would serve the commercial world as it is doing to-day. Hardly had the discovery of X-rays been made known when thousands were racking their brains to find in them as many methods for their practical use. So far has this idea of utility been developed in this country with regard to the physical sciences that every new fact must in some way serve mankind. This feature is not so prominent in the biological sciences, though much has been done in this direction, especially in medicine and in the propagation of many of our useful plants and animals.

The mapping of the life zones of North America, as begun some few years ago by our Agricultural Department, is already asserting its usefulness. These zones are based on a careful study of the geographical distribution of our land plants and animals, their life-histories and interrelations. This same kind of work must also be extended to our waters, from which we receive such a delicious and abundant supply of food. Observations to this end must be frequently made and constantly carried on during the entire year and under favorable circumstances. Our knowledge of the marine animals which we use for commercial purposes is far too limited. Much infor-

mation concerning their geographical range, breeding places and habits, migrations and laws governing the same, is very meager and indefinite. On the other hand, there are thousands of other animals upon which these are more or less dependent, concerning the life-histories of which we know nothing.

The work done in our present marine biological stations is worthy of high commendation, and any effort to establish other stations should be encouraged. As I have remarked, these stations are established only to afford students an opportunity to study fresh marine forms and to promote and facilitate research purely scientific.

It seems to me that the time is now ripe to establish on our coast Government biological stations, whose objects should be not only to encourage, aid, and promote scientific research, but also to devise means to turn into practical use, as far as possible, all of our knowledge of marine life. These stations should give especial attention to the study of the geographical distribution of all animals, their migrations, and laws governing the same—in fact, everything which bears on their life-histories and their interrelations.

These stations should maintain each a dozen or more tables for the use of investigators from time to time from our various educational institutions. These tables should be used only by men who had already demonstrated their ability to do research work of a high character, and whose purposes at the station were clearly defined. In this respect I would suggest that the policy of the zoological station at Naples be largely followed. This station is the most perfect, and from a scientific standpoint the most useful, of any in the world. It has been in existence a little more than twenty-five years, and its privileges have been used by many investigators from all civilized countries. It is in possession of more information concerning the life of the Bay of Naples than is possessed of a like extent of sea by any other institution. It is strictly a scientific institution, and in this respect has been eminently successful. Its success is largely due to the facts that it is open during the entire year and that its privileges are used only by a high grade of scientific men. A station of like nature established somewhere on the Florida coast, and which would combine the additional feature of the solving of biological problems which have a direct bearing on the commercial products of the sea, is a greatly needed institution, and should, I believe, be largely maintained by our Government and controlled by our United States Fish Commission.

The fishery interests of Florida coasts alone are steadily becoming of immense importance. Her fishes, oysters, turtles, sponges, etc., are found in the markets of our great inland cities. Concerning the growth of these products we know too little. Concerning the plants and animals upon which they are dependent for food we know far less, and our knowledge of the enemies they encounter while in the sea is very deficient. Our information along these lines can best be increased through the agency of one or more biological stations, as I have mentioned. I have remarked that these stations should be controlled by the Fish Commission. The work for them to do lies strictly within its province. It is partially equipped, both as to men and apparatus, for the work.

The fact that this Congress is attended by representatives of many scientific institutions is a sufficient guaranty of their appreciation of the work of the Commission and their interest in the problems connected with the fishery industries. The solution of these problems must fall to the labors of our trained scientific men, and in the establishment of a Government marine biological station efforts should be made to invite to it

the best talent in the country. In the Naples station tables are supported by Cambridge and Oxford universities. Fellowships are given in these institutions which permit students of excellent record to use these tables, in addition to which each student receives from the university a certain amount of money.

In our own colleges and universities are many undergraduate and graduate students engaged in research work, and who are much hampered because of the lack of material. Some of them, because of the expense in securing the proper material when on the coast, are obliged to abandon indefinitely lines of investigation which they have begun. Many of our leading universities give fellowships to meritorious students. These fellowships give the student special privileges of the university, and from nothing to about \$1,500 per year. Often the student is allowed to spend his time in study in some other university, usually abroad, because of the special advantages it offers in his particular line of work. A Government biological station could be established and so managed that it would invite these students to its privileges, more especially that particular grade of students engaged in special lines of work having the most direct bearing on problems of economic importance. In this way the greatest possible results could be attained at a minimum of expense.

We have represented at this Congress the United States Fish Commission, some State commissions, commercial fishermen, sportsmen, and a number of scientific institutions, and I believe it could fulfill no better mission than to in some way encourage our National Congress to supplement its appropriation to the Fish Commission, and urge that it establish and maintain at least one biological station on our southern coast, somewhat after the manner which I have outlined. Its importance and usefulness would soon be appreciated, and I am sure it would be productive of valuable results.

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