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ECONOMIC CONDITIONS OF THE FISHERIES IN ITALY.

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HONORABLE PRESIDENT, LADIES, AND GENTLEMEN OF THE CONGRESS: It is a gratifying duty that I have to perform in thanking the honorable gentlemen who have welcomed us to this congress and the members of its organizing committee for the courteous invitation extended to Italy to be represented at this important gathering. I do so personally and in the name of the Government of Italy, whom I have the honor to represent. I can assure you that the Government of my country takes the utmost interest in this assemblage of eminent scientists and technical men, gathered here for the purpose of studying the multifarious problems connected with fishing and of promoting an industry which is probably the oldest to which man has applied himself for his sustentation. The Government of Italy attaches the greatest importance to this congress because it is in sympathy with the development of fish culture, and not only the Government but also the scientists of Italy will follow with great concern the labors of this congress, as is evidenced by the presence here of one of the best-known Italian authorities on the subject, viz, Prof. Decio Vinciguerra.

No better place for a fishery congress could have been chosen than Washington, the capital of a great and modern nation, stretching from one to the other of the two largest oceans of the earth and embracing a great variety of climates, which enable it to avail itself of a great diversity of sea food; traversed by numberless rivers, among them some of the largest in the world; containing some of the greatest inland water basins; a country rich in streams, bays, gulfs, inlets, where the supply of fish is so abundant; in brief, a land which combines so many natural advantages and favorable conditions for fishing as to be beyond comparison with any other part of the globe.

But there is another and yet stronger reason why the United States of America has attained preeminence in the fishing industry, and this is to be found in the fact that its people have sought and are continually striving for a better utilization of these natural factors of economic wealth, thus standing as an object lesson to other countries where the bountifulness of nature has not always been a stimulus to development and to the exercise of such effort as to

attain a high standard of progress. It is this exercise of endeavor to a constant betterment of conditions in all branches of human activity that characterizes this nation essentially, and it is this characteristic that most strikes the attention of foreigners when viewing the economic and social conditions of this country. It is this spirit which pervades the national life, the factor, quite as important as the natural wealth, that has brought the United States to the front in all lines of activity, and that makes it the object of admiration of all civilized countries.

To this well-directed and successful effort through the Government, associations, and private individuals, and to the splendid work of the American fisheries bureau and of the many stations, scientific laboratories, and aquariums, is due the fact that this country derives from the fisheries greater profit than any other, although it is only about half a century since the pursuit of fishing has been able to avail itself of the advantages of scientific research and discoveries—this itself a line of work in which American talent and ingenuity have probably many followers, but none surpassing them. Owing to these conditions we come to this congress as to a school from which we are certain we shall go away greatly enlightened.

The country which I have the honor to represent has since time immemorial occupied itself with the pursuit of fishing. The lacustral inhabitants of northern Italy who had built their homes on the lakes in order to attain the conditions of safety that were essential to their social life must unquestionably have been fishermen. We learn from ancient historians of people living on the shores of the Mediterranean who were great consumers of fish. Sea food figured prominently in the fare of the ancient Romans, especially in the great dinners with which Lucullus, Hortensius, and other Roman amphitryons used to delight Roman society during the golden period of Latin history. We have all read about the "muræna," a favored dish with the Romans, and which, according to an ancient writer, had to swim three times—in water, in sauce, and in wine—a habit of swimming which fish still preserve to-day. That the Romans favored fishing, notwithstanding the primitive methods by which it must have been carried on at that time, there is no doubt, for we know that sea food entered largely into the diet not only of the rich but also of the plebeian classes. Moreover, we can not peruse the Georgics of Virgil or the Metamorphoses of Ovid without meeting frequently with references to the inhabitants of the deep. The advice of Ovid, "*Semper tibi pendeat hamus quo minime credas gurgite, piscis erit*" (Let thy hook be always ready, as a fish will often be in waters where thou least thinkest of it), is in both fishing and common life still of up-to-date application.

During the middle ages and the troublous times which characterized that period of Italian history, the Church, which had built on the ruins of the Roman Empire a new order of things based on Christian teachings, became the patron

of the fishing industry chiefly by reason of the dietetic precept of abstinence from meat during certain days of the week which it imposes on its followers; and we are reminded of the fact that the Church was established by a fisherman, and that several of his colleagues were of the same calling. It is undeniable that the Church exercised a favorable influence on the industry of fishing, which flourished and received further stimulus when Italy, under the republics of Venice, Genoa, Pisa, and Amalfi, which were essentially maritime states, began to send fishermen all over the Mediterranean and found in fishery the most efficient and practical school for raising a population of able seamen, to whom is essentially due the greatness acquired by those famous republics.

Even to-day Italy maintains preeminence in fishing in the Mediterranean, which is due to the Italian labor engaged in this industry. Italian fishermen are to be found all along the coast of Algeria, Tunis, Tripoli, the eastern shore of the Adriatic, and in the Greek Archipelago, often engaged in the most dangerous and varied forms of fishing, whether it be spearing the swordfish in the Messina Straits or plunging into the waters surrounding the Lampedusa Isle in search of sponges, trapping the tunny-fish on the western coast of Sicily and Sardinia, netting the shoals of sardines on the coast of Tuscany, or exercising themselves in the ingenious methods of coral fishing on the north African coast; all of which are special branches of fishing in which the Italians have attained great proficiency and enjoy a world-wide prestige and demand. They are also the support of important industries, such as the canning of tunny-fish, sardines, and anchovies, which find natural facilities in Italy's large production of the olive oil required in their packing.

Italy, however, with a seashore extending over 4,300 miles and a population of about 115,000 men that derives its means of livelihood from the sea, manning about 24,500 fishing boats, has a yearly output of fresh fish representing a value of only about 22,000,000 lire. Even allowing for the imperfection with which the statistical data are gathered, considering the great extension of her shore and the great amount of labor engaged in this pursuit, these figures show at once that the fishing industry in Italy, however traditional and assisted by the natural inclination of the people to it, is still far behind the reasonable expectations of the country, especially from the standpoint of the profit that the fisherman derives from his industry, which is unfortunately lower than in any other important country of Europe.

The cause of these conditions, which make the task of the fisherman in Italy a rather thankless one, is not to be found in any want of activity or energy on his part, but to circumstances over which the husbandman of the sea has practically no control and very little means whereby to better things. Such are, for instance, the much discussed depauperation of fish in the waters where he exercises his activity, accentuated by the fact that no tentative effort has yet been made in Italy with regard to the restocking of maritime waters with fish;

what has been done in this direction being confined to the restocking of inland waters with choice species, where the conditions of the industry are perhaps enjoying the advantages of greater attention. This is not surprising considering the fact, almost general even in the most progressive fishing countries, that fishing on inland waters is much easier and not fraught with the uncertainty and perils of the sea, and is therefore assuming every day more of a cultural character, the pisciculturist cultivating the water as the agriculturist cultivates the soil for the feeding of man.

But, returning to maritime fishing, the main reason why Italy does not make a better showing in its results from an economic standpoint is the primitive methods by which fishing is still carried on, entirely by small sailing craft, which in other countries have been largely supplanted by motor power to propel the boat and operate the nets. Then, the absence of proper organization and intelligent cooperation, which are necessary factors to secure a prompt and wide distribution of such a perishable article as fish, is another cause. Steamboats to carry the catch promptly to distributing ports; good landing facilities and a quick and well organized railroad service to expedite the delivery of the fish to the markets in the shortest possible time; an intelligent application of the use of ice and refrigerating plants in the transportation, preservation, and distribution of this perishable commodity; cooperative action among fishermen in order to secure to themselves the highest percentage of the profit deriving from their labor; credit within easy reach and at a moderate rate of interest to fishermen; elimination of octroi duties and the fiscal dues which at present handicap this industry—these are some of the essentials for rehabilitating its destinies.

Besides maritime fishing, Italy is greatly interested in inland water fishing, its numerous rivers, lakes, and lagoons suitable for this purpose occupying practically one-eighteenth of the surface of the Kingdom. Filippo de Filippi, a noted Lombardian zoologist, who was the pioneer of fish culture in Italy, stated that if there is a country favorably laid out by nature for the development of inland fisheries it is certainly the Valley of the Po.

Notwithstanding the inherent love of the Italian gentleman for angling, evidenced by the fact that there is no villa of any importance in Italy not provided with a "pescheria" where fish are raised, not for sale but for the private use of the owner who can exclaim with Carew—

Thus mean in state and calm in sprite
My fishful pond is my delight—

fishing in fresh water is probably in not much better condition than the maritime industry, and the value of the annual output of inland fisheries in Italy does not exceed 6,000,000 lire.

We have no special statistics to show what is the value of the fish taken from lagoons or estuaries, where fishing is an art that has engaged the attention

of the adjacent population from the earliest times. This blank in the Italian statistics is all the more deplorable as it is unquestionably from this source that a good deal of revenue from the fishing industry is derived. Of what importance these lagoon and delta fisheries, in Italy comprehensively called "vallicoltura," are to a considerable number of the Italian population may be seen from a glance at the hydrographic map of Italy showing the considerable extent of the Venetian lagoon, famous for its mullets; of the Valli di Comacchio, formed by the delta of the Po, where the eel, sung by Ariosto and Tasso, is the staple of fishery; and of the Mare Piccolo of Taranto, noted for its oyster beds, already celebrated in antiquity as were the esculent bivalves from Lakes Fusaro and Lucrino, which the Parthenopean siren offers to the visitors with the allurements of White Capri.

It is the fishing on inland waters that has received the greatest attention on the part of the Government, although even sea fishing has not been neglected, at least from the standpoint of legislation. With the progress of hydrobiology, a science which has developed practically within the last fifty years and to which the genial labors of such men as Spallanzani, Rusconi, Canestrini, Issel, and other Italians have largely contributed, dates the action of the Government to the fostering of this branch of national economy.

The lines upon which governmental action has been directed to the promotion of the fishing interests are summarized in the following paragraphs:

First. The policing of maritime and inland waters in order to discipline the catching of fish by prohibiting fishing during the time of the spawning and reproduction; by fixing the minimum distance from the seashore where fishing is allowed, as well as the depth at which fishermen may lower their nets; by establishing the kind and quality of the nets and the minimum size of fish that is allowed to be marketed; by prohibiting the use of explosives and poisonous materials in the catching of fish, and also the use of undesirable fishing apparatus; all of which disciplining is done according to the dictates of science with a view of regulating the supply, its continuance and increase. The enforcing of the laws and regulations on fisheries (the fundamental one of which dates from 1877) is intrusted to the captaincies of the ports, to the custom-house officers, to the officers of the royal navy in the case of maritime fishing, and to forestal officers, local police, and custom officers in the case of inland waters. Unfortunately this policing of fisheries in Italy leaves yet much to be desired in its application, and the law is frequently violated with great loss to the fishing industry, both through the incentive of illegitimate gain, and in a good many cases also through mere ignorance. Hence the necessity of insisting upon a greater spread of knowledge among the masses of the people regarding the habits of fish, the time and way in which their reproduction take place, migrations, and all technical information which may be conducive to greater enlightenment on the subject. This would be the best measure of prevention against damage often done through sheer ignorance.

While, of course, the necessity of laws and regulations disciplining fisheries in order to maintain their productiveness is unquestionable, we believe, nevertheless, that instruction and education are also great factors in preventing abuses and reaching a better standard. Instruction to this effect ought therefore to be imparted to the people at large in elementary and secondary schools, and this without speaking of the necessity of greater education along these lines to those who will be called upon to exercise their activity in the economic life of the nation.

Second. In having established advisory bodies, such as the Central Consultative Commission for Fisheries and compartmental commissions subordinate to the former, operating in the four or five maritime districts in which the peninsula has been divided for this purpose, and in having established besides provincial commissions on fishing. There are altogether about 25 such bodies.

Third. In having created three piscicultural stations, one at Brescia, another at Belluno, and a third at Rome, the latter in charge of Professor Vinciguerra, whom we have the pleasure of seeing at this meeting. These stations are intrusted with manifold duties, the principal of which is the incubation of the spawn and raising of the fry wherewith to provide for the repopulation of inland waters with fish of choice variety, and I am glad to state in this connection that millions of fry have been introduced of late years in the principal lakes and rivers of Italy, among the new varieties introduced being several American species of trout and whitefish. The directors of these stations are also required to give periodical lectures on fish culture and to spread useful information in regard to the industry. It is superfluous to state that the results obtained have been excellent, when the comparatively small appropriation for their sustenance is considered, and their action bids fair to exercise a deep influence in the revival of fish culture in Italy. The Government has also in late years, with the cooperation of local bodies in Venice, established a school for fishermen and for the preparation of technical men, which has supplied a want that had indeed been long felt and which has already accomplished much good in organizing the fishermen of the Venetian shore for a cooperative method of work. Courses of biology in connection with fish culture have also been instituted at the universities of Rome and Messina and at the Agronomical Institute of Milan, and have become popular among the students.

Fourth. In having provided money prizes and awards in medals for encouraging cooperation among fishermen and rewarding the efforts of any society or private party endeavoring to foster the interests of fish culture in the Kingdom. The action of the Government has been ably seconded by such bodies as the Società Lombarda per la Pesca e l'Acquicoltura, Società regionale Veneta per la Pesca e l'Acquicoltura, and Società Aaliona per la Pesca.

It is to the concomitant efforts of the Government, of technical institutions, and of men such as Pavesi, Carazzi, and others that a greater interest is

being taken to-day by my country in developing the resources of its waters, an interest which will eventually lead to larger appropriations from the national treasury for aiding this industry in a way more adequate to its possibilities and requirements.

Hydrobiology and its recent discoveries have opened new horizons to the possibilities of what has been comprehensively called "water culture." The natural depauperation is being remedied with the restocking in all waters inland, where new fields of fishery are suggested, such as the raising of carp in rice fields, as well as in the sea, evidenced by the restocking of the fjords of Norway with the eggs of the codfish.

The importance of the plankton to fish life, of the flora and fauna living on the borders and in the bottom of waters; the relation of temperature to the inhabitants of the deep, which has suggested in certain localities the application of the thermometer to fishing; the relation of the chemical composition of water and of its greater or lesser saltiness to the population of the seas; the pathology of fishes, the application of artificially promoted diseases to obtain industrial results, such as the grafting on the pearl-producing oyster of the parasite which is the cause of the formation of the pearl, an original suggestion by Professor Issel of Italy and utilized by Herdman on the waters of the Ceylon island; the habits and various stages of life of different fish having partly a pelagic and partly a fresh-water habitat, such as the eel; the prevention of the iniquation of waters from the refuse of industrial establishments; the reforestation of lands to prevent muddy waters that are prejudicial to the life of delicate fish—all these subjects are to-day far better understood and studied than ever before, not only by the general scientific world but also by progressive ichthyologists.

Although the "cultivation of the water" is a far more difficult problem than that of the solid crust of the earth, not only because of the greater perils with which the former is identified, but also because we are less acquainted with the conditions of existence of the animals which populate the water, still it is one of those problems the importance of which the future will make even more evident and impellent. The preoccupation manifested years ago by Sir William Crookes with regard to scarcity or insufficiency of the staple of life confronting humanity in a near future need not engross the minds of economists, because it will find its natural solution in the increased rate of production of wheat which is within the sphere of reasonable possibilities, and also because human ingenuity, as the population of the earth increases, will develop other sources of supply of food. If in the past humanity has called upon the earth for its main sources of sustentation, the humanity of the future will call upon the water in a more intensified form for this need; and the "intensive cultivation of water" as well as of the earth will be a conquest probably not so remote as we may believe.

The contribution that Italy has already given, and I hope will be able to give in the future in greater degree, toward this desirable end is and will be

notable, judging not only from the standpoint of the eminent services which her scientists have rendered to the progress of this, as well as of many other branches of activity, but also from the viewpoint of the aid that her seamen will give in the domain of the multiform energies of the water. Those fishermen who, through no fault of their own, can scarcely make a living on home waters, you will find industrious and prosperous where natural and economic conditions have been more generous to humankind. And thus you see Italian seamen controlling fishing in several parts of this country, such as certain parts of the Pacific and the Florida coasts.

Hence the importance that Italy attaches to this congress, in which she is taking more than a passing interest, for the promotion of American fisheries means also the promotion of the interests of a large class of countrymen of mine engaged in this field; and the best wishes for the successful labors of this congress, the result of which I shall report to my Government with that satisfaction that comes not only from the acquiring of new knowledge, but also from the certainty that this new knowledge will be highly beneficial to all countries interested in the exploitation of the waters.

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