



Tribute to Professor Massimo Sella – former scientist and Director of the Marine Biological Station in Rovinj – On the occasion of 120th Anniversary of marine research in Rovinj (1891–2011)

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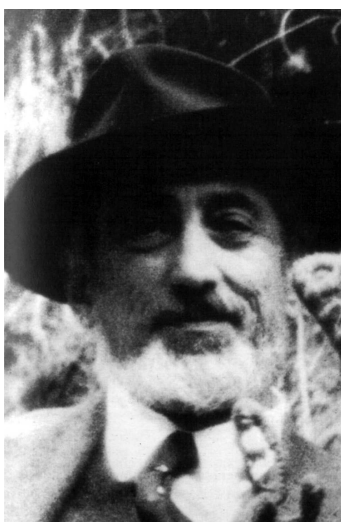
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Short historical background of marine research in Rovinj



In 1891, Otto Hermes founded in Rovinj a station of Zoological garden and aquarium in Berlin, with the main purpose of collecting marine organisms for the Aquarium in Berlin. The famous German physician and pathophysiological Rudolf Virchow visited several times his friend Baron Georg von Hüttenrot in former monastery located on the island St. Andrija nearby the city of Rovinj, and deserved credit for the promotion of scientific activities and foundation of the research in the Biological Station. He initiated visits to the Rovinj's institution by Fritz Schaudinn prominent scientist

of that time (discovery of *Spirocheta pallida* pathogen of syphilis). In 1903 Stanislaus von Prowasek (biological cycle of parasitic flagellate *Trypanosoma*) accepted an invitation from Schaudinn to work as his assistant collaborating with Biological Station in Rovinj. From 1907 until 1911 via a research vessel »Rudolf Virchow« were organized summer cruises in Adriatic Sea. Plankton collections were studied by Adolf Steuer (1910) author of *Planktonkunde*, a textbook used even now by students and scientists for studies of the aquatic plankton populations in Adriatic. Massimo Sella was appointed in 1923 as Director of Biological Station in Rovinj.

After the turmoil caused by the World War I many looked to the League of Nations to bring stability to the world. Italy and Germany accepted the League of Nations, as mediator of Italian-German scientific cooperation in Rovinj. In 1930 a contract between Regio Comitato Talassografico Italiano of Rome (Royal Italian Oceanographic Com-

mittee) and Kaiser Wilhelm Gesellschaft zur Förderung der Wissenschaften was signed, leading to the foundation of the Italian-German Institute of Marine Biology in Rovinj. Common leadership of the Institute by two co-directors was initiated: Massimo Sella was appointed by Regio Comitato Talassografico (1923) and Adolf Steuer, professor at the University of Innsbrück, was appointed from the German side by physicist Max Planck, president of Keiser Wilhelm Gesellschaft (later the Max-Planck Institutes). Aristocle Vatova was nominated in 1924 as an assistant of the Institute of Marine Biology in Rovinj (1, 2). Professor Sella supported his work on benthic studies (3). From 1931 to 1943, by the Institute were issued two scientific journals : *Thalassia* and *Note dell'Istituto di Biologia di Rovigno*.

A few excerpts from the Italian-German agreement (4) demonstrate that the consortium of both sides should work on an equal basis, with control mechanisms and management as a good ground for successful cooperation of the Institution. Having regard to the Convention concluded at Berlin on February 25, 1930, between the authorised representatives of the *Regio Comitato Talassografico italiano* and the *Kaiser Wilhelm Gesellschaft zur Förderung der Wissenschaften*, regarding the creation and operation of the Institute of Marine Biology at Rovigno.

Article 1

A Consortium shall be set up between the Regio Comitato Talassografico Italiano of Rome, represented by its President, and the Kaiser Wilhelm-Gesellschaft zur Förderung der Wissenschaften of Berlin, also represented by its President, with the object of providing for the working of the Institute of Marine Biology at Rovigno (Istria), in the interests of the two Institutes concerned, and of scientists in both countries. The Consortium shall be called the »Italo-German Institute of Marine Biology at Rovigno«, and shall have its official seat at Rovigno. The Consortium shall be constituted by Royal Decree promulgated by the Italian Government as an independent corporation with a clearly defined legal status.

Article 2

The Royal Italian Government shall transfer free of charge to the Consortium the full ownership of the Institute of Marine Biology at Rovigno, which shall enjoy the same fiscal treatment as at present. The ownership of all the property of the Regio Comitato Talassografico at present assigned to the Institute shall likewise pass to the Consortium. Expenditure for the installation and working of the Institute shall be borne equally by the Regio Comitato Talassografico and the Kaiser Wilhelm-Gesellschaft zur Förderung der Wissenschaften. In respect to the permanent scientific staff of the Institute, however, it shall be known by the Contracting State of which such persons are nationals. The salaries of the staff shall be fixed by the Board of Directors.

Article 3

The authorities of the Consortium shall be : (i) The Board of Directors ; (2) the Managing Directors ; (3) the Auditors.

MASSIMO SELLA – SCIENTIST, INTELLECTUAL, HUMANIST

Massimo Sella was born in May, 29, 1886 into an industrial and bankers family in Biella, a small picturesque town in the Italian province of Piemonte. Massimo Sella graduated in natural history and defended a Ph.D. degree in Rome under the supervision of Professor Giovanni Battista Grassi (a pioneer in studies of *Plasmodium vivax* and *Plasmodium malariae*; he studied transmission of malaria by *Anopheles* mosquitoes). At the University of Rome young Massimo Sella was appointed by professor Grassi as assistant and latter docent of Comparative anatomy at the University of Rome. As a young man he was occupied by ideas to participate in the dirigible expedition »Nobile« to the North Pole. He participated to the humanitarian mission after the devastating earthquake which occurred in 1908 along the Straits of Messina between the island of Sicily and the Italian mainland.

His main preoccupation was marine biology. After a specialization in ichthyology in Norway, Massimo Sella was offered three options for his further career. One was a Rockefeller fellowship in the USA, another the continuation of an academic career at the University in Rome, and the third a working position in the Biological Station in Rovinj. He accepted the third option and in 1923 was appointed as a Director of the Biological Station in Rovinj.

The activities of Massimo Sella included scientific work on sponges and the migration and life of eels and tuna fish. Not less important was Sella's engagement in solving problems of the local society in Istria, directed to prevention of the disease of malaria and the discovery of truffle grounds in the inner parts of Istria and promotion of its exploitation.

Under an Italian-Libyan joint project, exploitation of sponges along the Libyan coastline has occurred over a period of 150 years. In 1920, for example, 70 tonnes of sponges were exploited in Libya. Sella recommended sustainable exploitation and was engaged in fundamental studies of the ecology of sponges. He characterized crystalline iron minerals sized between 0.5 and 2.5 μm in sponges of the genus *Porifera* (5). Coloration of these crystalline structures varies in intensity from specimen to specimen and is caused by minute, strongly light-refracting particles attached to the fibers of the sponge skeleton. The so-called iron mould »Eisenfleck« is usually more common and intense at the »root« of the sponge, the area of attachment to the substrate. These studies provided the first evidence of mineralization among the horny sponges (*Keratosa*).

In the Mediterranean and Atlantic, bluefin tuna catches dated from ancestral time and were carried out by trap fishery (tonnare). Professor Sella demonstrated pe-

riodic fluctuations of large amplitude (about 50 years) as well as short-term variations of bluefin population in the Mediterranean. He suggested fishing regulation standards for tuna fish – the resources of which are being found at a critical stage of overfishing during the last eighty years of exploitation. The constant and progressively increasing catch has caused the end of traditional bluefin tuna fisheries in the Atlantic Ocean as well as an alarming overall decrease of the fish population. The scientific interest of Massimo Sella was oriented to the migration of bluefin tuna (*Thunnus thynnus*). In a scientific publications (6, 7, 8, 9), he made an appeal to fisherman for collection of hooks from which bluefin tuna had broken free. Since at that time the types of hooks used in catching bluefin tuna in Europe were characteristic and exclusive by local use, so he was able to note by this »tuna tagging« the approximate distance travelled by fish from the point of recovery. Based on these studies, Sella suggested that tuna migrate every year from the Atlantic through the Strait of Gibraltar to the Mediterranean for spawning. The migration route is along the African coast (Morocco, Algeria, Libya) In 1929, Sella participated in an International Congress in Sevilla and reported these important studies on tuna fish migrations. Professor Sella noted that bluefin tuna become mature at age three-to-four years (10). His methods to estimate the age and growth of *Thunnus thynnus* were based on the examination of calcified concentric rings in vertebrae and are successfully applied also nowadays. Ageing comparisons from vertebrae and spines of bluefin tuna coming from the same species give comparable results (12). The use of vertebrae for the age studies was quite satisfactory beyond the fish age of fourteen. The ancient population of tuna represented by Sella's collection of skeletons (1880–1930) from central and western Mediterranean regions was recently used to provide historical records as a basis for contemporary scientific analysis using techniques of molecular biology in studies of temporal (historical) and spatial (geographic) variations of tuna fish populations. By studying microsatellite loci from contemporary and historic samples it was found that the Mediterranean population contains subdivided populations. This structure has persisted for over 100 years and gene diversity has remained intact in spite of overexploitation and dramatic decline of the populations (13). The existence of multiple breeding stocks raises concern that the newly recognized gene pools are at risk from overfishing. In the cited publication, the authors give tribute to Professor Sella, putting his name as a coauthor of the publication. Even half a century after the death of Massimo Sella, his name is cited in recent internationally recognized scientific publications.

In 1920 Sella confirmed by tagging eels a connection of Pazin (small city in Istria, Croatia) subterranean waters with Raša River and possibly a connection with sea at the Limski kanal (14). He also studied changes of length of eels occurring during transformation of transparent larval stage and metamorphosis.

In 1920 International Red Cross Office in Geneva nominated Massimo Sella to organize antimalaric campaign. In 1921, Red Cross Society under the direction Dr. Sella undertook an antimalaria campaign in Spain. Not less important is also Sella's activity in solving sanitary problems important for the local inhabitants in Istria (15). In 1920–1930 severe problems with malaria affected the local population in Istria and large regions all over the Europe. Following the discovery of the role of *Anopheles* mosquitoes in transmitting malaria, biological methods (instead of insecticides) were sought. The viviparous fish *Gambusia holbrooki* has for many years been considered as an important predator of the immature stage of mosquitoes, the subspecies *G. affinis holbrooki* being the most abundant of natural predators of *Anopheles*. As American ichthyologists had discovered the carnivorous characteristic of *Gambusia*, Professor Sella organized transportation of *Gambusia* from New York to Trieste by the ship President Wilson and courtesy of Captain Cosulich. From Trieste, fishes were transported in 50-l metal containers and introduced in several ponds in Istria (16). Predation on native zooplankton populations and competition with other existing fish species are not well characterized. However, *Gambusia* was successfully used in Istria and Kvarner Littoral to control mosquito populations (15, 17, 18) and still live in some ponds close to Rovinj.

Professor Massimo Sella was the first one to suggest that, like in his native region closed to the city Alba famous for the white truffle, Istria might be also good ground for truffles. Together with his friends Carlo Testoni and Pietro Giovanelli he was successful in collecting truffles (tartuffe) in the valley of river Mirna. Local inhabitants told them that under the surface soil are »black potatoes«, food for pigs. In 1933, Sella with *Baronese* Barbara von Hütterott established in Livade a company for the exploitation of truffles.

What were the distinguishing characteristics of this remarkable person? First was his dedication to marine biology, his local environment, and global problems as well. Professor Sella was a well-rounded intellectual with polyvalent broad interests. In addition to science his interests were directed in the fields of artistic-documentary photography and writing books (19), dialectology, and music. He was multilingual in addition to Italian, in English, German, French, Spanish and Latin. Sella was an excellent musician playing Bach toccatas and Beethoven fugues, Chopin mazurkas, and Vivaldi concertos. He invited local brass band musicians in Rovinj and a few violin players with the intention to transform the local brass band into a classical orchestra and performed concerts in the former building of the Cinema in Rovinj playing the 1st Beethoven piano concert. Professor Sella was unconventional personality frequently seen in Rovinj on a bike wearing a white jacket.

In 1940 his friend and colleague co-director Adolf Steuer retired. The coming turbulent times were not a good ground for scientific activities. It was urgently suggested to Professor Sella to leave Rovinj. After Italian ca-

pitulation following allied invasion of Italy steamboat Beroe, used by the Institute for supply of aquaria animals, sunk, just before professor Sella's intention to leave Rovinj. At that time in Institute were present Professor Sella and a German lady working on Ctenophora. They took bicycles and on the 8th of September 1943 left Rovinj in the direction of Trieste.

After the war Professor Sella was a member of the state commission for scientific cooperation with Yugoslavia. On September, 04 1959, Dr. Sella died at age 73.

About two decades of prominent work Professor Sella left deep tracks in building and maintaining the scientific continuity and international image of the Institute for Marine Biology in Rovinj. Also, his contribution to solve sanitary problems for local inhabitants, as well as promoting cultural level in Istria should be remembered.

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