

THE ISTITUTO SUPERIORE DI SANITÀ: PAST, PRESENT AND FUTURE

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Distinguished guests, ladies and gentlemen, I wish to welcome you all to this International Symposium on: "Public Health Institutions: the Role of Science and Technology", which is held to celebrate the 50th anniversary of the foundation of the Istituto Superiore di Sanità.

In particular, I would like to emphasize the international character of the Symposium: health sciences, like all fields of science, can only make progress through full international cooperation that knows no national boundaries. It is sincerely reassuring that science is a stronghold of genuine international cooperation, and, at least most of the times, not susceptible to political pressures, even in a world beset by factions and ideological conflicts. Today the Istituto Superiore di Sanità, whatever the barricades separating nations from each other, whatever the world turbulences and tensions, faithful to its origin, strives to remain a vigorous component of the international scientific community.

International cooperation was actually the cornerstone on which the Istituto Superiore di Sanità was founded fifty years ago. A detailed account of the Istituto Superiore di Sanità history has been distributed to all participants.

As long ago as the 1920s, the Hygiene Committee of the Society of Nations, born out of the peace treaty of the first world war, with what (in retrospect) was certainly prophetic insight, recommended to each member country the establishment of experimental institutes of health with the goal of improving national health care activities. The standard and quality of the work performed at that time in Italy on malaria, by Dr. Alberto Missiroli among others, was an excellent platform on which the important role of research in improving health care had already been established in our country.

The Rockefeller Foundation took up the task of implementing the programme of the Society of Nations by means of financial support to those governments which were willing to establish laboratories of public health aimed to introduce, in the health care system, standard methods for prevention and diag-

nosis, to monitor them in the actual practice and to strengthen national efforts in health services by means of specific educational programmes.

In 1928, Dr. Hackett of the Rockefeller Foundation was working with Dr. Missiroli in a special anti-malaria laboratory, supported by the same foundation. Thanks to the combined efforts of these two scientists, an agreement was reached, in 1929, between the Italian government and the Rockefeller Foundation for the construction of the Istituto Superiore di Sanità. The Rockefeller Foundation gave a financial support of one million dollars, while the Italian government provided the grounds and the necessary financial support for the Institute activities. Therefore, it is with deep gratitude that I wish, also on behalf of all the people who have worked and work now in this Institute, to mention here the insight of the Rockefeller Foundation.

Medical sciences in the 30s in Italy were focused, to a large extent, on the varied physical infirmities characteristic of a people mostly working in rural areas with a few industrial centres under development in the North. Moreover malaria was still a major problem in more than half of our country, where it was associated with β -thalassemia. Malaria is eradicated today in Italy, but its selective pressure has made thalassemia and other haemoglobin disorders a national health issue which we still have to cope with in terms of prevention and treatment.

Therefore, in the Istituto Superiore di Sanità the following laboratories were established: Chemistry; Bacteriology; Biology; Public health engineering; Physics; Malariology; Epidemiology.

They had to address the nation's health problems by means of:

- a) fundamental and applied research;
- b) development of training programmes to supply qualified personnel for health care services;
- c) quality controls on food, drugs, radioactive compounds employed in therapy;
- d) production of serum and vaccines.

The latter endeavour was the basis on which the present day knowledge of the methods of prevention and diagnosis was built and strengthened throughout more than thirty years of our past history. In fact, the introduction into the health care system of vaccines produced by us, raised the first issue of their efficacy and safety and the first needs, at least in our country, for the data necessary to evaluate both costs and benefits.

Prof. Domenico Marotta, Director of the Istituto Superiore di Sanità from 1935 to 1964, clearly understood the value of "quality" in research. He upheld the principle that "good" research is possible only with good researchers. Therefore, not only did he create a first-rate scientific environment based on first-rate equipment and services, but also recruited first-rate minds. Without his insight, perseverance and personal ability to bypass bureaucracy, our Institute would have not developed past its initial stages. The openmindedness of Professor Marotta was duly rewarded, as the high level of performance of the institutional tasks of the Institute by a qualified staff provoked an international response.

The late Sir Ernst Chain, who shared the 1945 Nobel Prize with Fleming and Florey for the discovery and characterization of penicillin, joined our Institute in 1948 and created the International Centre for Chemical Microbiology which in ten years of intense pilot activity established the basis for the industrial production of antibiotics.

Concomitantly, Professor Daniel Bovet was appointed director of a new laboratory for the study of the relationship between chemical structure and pharmacological activity. His discovery of the paralysis induced by curare in the voluntary muscles by the action on synaptic functions, led to the subsequent widespread use of the same poison as an adjunct to anesthesia in cardiosurgery and to the Nobel Prize for medicine in 1957.

In the 60s the political turmoil was reflected in the internal life of the Institute by interminable debate and strife that two good scientists tried to manage: the late Prof. Giacomello and Prof. Marini Bettolo, in their capacity of Director General. Their difficulties were due to the inability, or reluctance, of the scientific establishment to address the question of the role of science and technology in the aftermath of the post-war tumultuous industrial development.

The answer came, instead, from the Institute personnel, which strongly endorsed the introduction of new and bold concepts for the management of our activities. These concepts, adopted unanimously by the Italian parliament in 1973, gave the Institute a very functional and dynamic structure. Another principle was supported without reservation: that fundamental science is the cornerstone of health research, and that support for new areas had to be established within the Institute, namely epidemiology, biostatistics, toxicology, environmental surveillance, food hygiene and pharmacology. The

importance of these activities, which are multidisciplinary in nature and have a general applicability to a number of problems, was re-affirmed in 1978 with the creation of the national health service. In that occasion, the Italian parliament made the Istituto Superiore di Sanità the technical body of the national health service, expanding its existing activities. This new national health service strongly emphasizes prevention and rehabilitation.

At the present day our Institute is organized in 21 laboratories and 9 services:

Epidemiology and biostatistics

Food sciences

Drug chemistry

Pharmacology

Bacteriology and medical micology

Biomedical engineering

Cell biology

Clinical biochemistry

Haematology

Immunology

Metabolism and pathological biochemistry

Organ and system physiopathology

Parasitology

Ultrastructures

Veterinary medicine

Virology

Applied toxicology

Comparative toxicology and ecotoxicology

Environmental hygiene

Hygiene of closed environments

Physics

The activity of the laboratories basically consists of scientific research, technical development, controls and transfer of results to local health services. All together or in groups sharing a common scientific field, they act as an advisory board in the following health-related topics:

- infectious and non-infectious diseases;
- food sciences;
- drugs;
- production and use of toxic chemicals;
- physical agents in clinical applications and in everyday life;
- environmental hygiene;
- biomedical devices;
- biotechnologies;
- education in control, diagnosis and prevention methods;
- zoonoses.

Recently the Istituto has established the "National inventory of chemical compounds" containing the chemico-physical and toxicological properties of chemicals in order to assess the risks associated with their presence in the environment. Furthermore, the Istituto Superiore di Sanità is the focal point in Italy of the International Program on Chemical Safety of the World Health Organization (WHO), and recently has also taken responsibility on behalf of WHO Veterinary Public Health in Disasters.

Of the hundreds of basic and applied research projects under way at the Istituto, I can mention only the general goals we strive to pursue in those areas of investigation in which there is so much work to be done.

Environmental hazards

a) Behavioural effects of environmental contaminants, also in order to determine acceptable levels for already known toxic substances that is difficult, if not altogether impossible, to remove from the environment (for example, mercury in sea-water fish);

b) epidemiological studies to assess the long-term effects of human exposure to food contaminants and technological adjuvants, to low levels of ionizing and non-ionizing radiations;

c) development of sensitive and validated methods for the rapid assay of mutagenicity, carcinogenicity and teratogenicity.

Infectious diseases

Chemotherapy has dramatically reduced the mortality due to infectious diseases, the same is not true for morbidity. Morbidity data are today quite similar to those of a few decades ago.

In addition, recent developments of molecular biology have made "antiviral chemotherapy" a new and fascinating challenge. In this respect, a significant and well recognized amount of work has been carried out in the Istituto to pin-point the biological role of interferons.

We are therefore concerned with the necessity of maintaining and supporting studies on the:

a) epidemiology of infectious diseases, particularly of those acquired during nosocomial treatment;

b) control and follow-up of specific vaccination campaigns;

c) aetiology, diagnosis and prevention of acute diarrhoeal and respiratory diseases;

d) mechanisms of infection of opportunistic bacteria, and/or fungi;

e) mechanism of action of bacterial toxins;

f) aetiology of newly emerging diseases such as the Acquired Immunodeficiency Syndrome;

g) medical entomology, parasitology and zoology of zoonoses.

Non-infectious pathology

Among the approaches to health protection, large-scale epidemiologic studies on cardiovascular diseases have been and are currently pursued. Some population groups under study have been followed up for more than 20 years. The prevalence study of cardiovascular risk factors, thus conducted, has been continuously updated in connection with specific educational programmes focused towards the individuals under observation. The main objective of future studies will be the participation in the WHO project to MONITOR Cardiovascular diseases (MONICA) and to the European Risk Factor Incidence Coordinated Analysis (ERICA).

Another major area in which the rate of advance — and the importance of that advance — are of a special contemporary significance is that of cancerous diseases. Important fundamental studies on acute lymphoid leukemia have shed light on the role of oncogenes in the pathogenesis of these diseases, therefore we plan to continue intensive work on oncogenes.

Another area of interest in our Institute is that of the biology of aging and the behavioural and neurobiological sciences. Equally, we are involved in research into genetic and metabolic disorders, to which we apply the techniques of DNA recombination. An important addition to the battery of techniques used to tackle molecular, biochemical and pharmacological problems, is the developing technique of inserting biologically active macromolecules into specific target cells by means of reconstituted Sendai virus envelopes.

We promote and encourage research also in the interdisciplinary field of biomaterials.

Food sciences

Three key areas of activity have been identified: survey of food safety; metabolism of nutrients relevant to child development and to chronic diseases in man; effects on nutrient of technology development.

Drugs

Particular attention is paid to the development of reliable methods for quality controls of raw materials and finished products. Basic research is also carried out, dealing with extraction and testing of biologically active compounds from plants. Studies are conducted on the mechanism of action of drugs, with particular regard to those acting on the central nervous system. Efforts are devoted to the development of animal models for studies of gerontopsychopharmacotherapy.

In the field of drug abuse, a survey on the present situation in Italy has been completed. Further investigations aim at the evaluation of the risks of the onset of specific diseases in the addicts by monitoring a number of specific immunological parameters.

I have little doubt in reaffirming my belief in basic research and international cooperation to forge the tools to help assure quality health care for all.

Medical sciences and health care are among the best investments a society can make. I believe we share these values. They are the values that have supported our work and the work of all the col-

leagues who have preceded us through the first fifty years of the Istituto Superiore di Sanità. And these same values must sustain our continuing efforts to improve our nation's health care system in the years to come.

Thank you.