

## Past, Present and Future of the “Prince Leopold” Institute of Tropical Medicine, Antwerpen, Belgium

Paul L. GIGASE

### *Prince Leopold Institute of Tropical Medicine*

#### *The Past*

A school of Tropical Medicine was established in 1906 in Brussels by King Leopold II. In this he followed the advice of physicians from the similar school of Liverpool, a.o. Todd, after a mission in Central Africa they had performed on his request. No wonder that the structures of both Institutes are in many ways similar. The purpose of the school was to give to Belgian physicians who departed for the Free State of Congo, at that time a private property of the Crown, some knowledge on tropical diseases, not available in the medical schools.

The school extended its training to veterinarian doctors about problems of tropical animal medicine from 1909 on. In 1919 it also started training nurses, missionaries and so-called “agents sanitaires” whose task it was to implement in the field the control measures on major endemo-epidemic diseases.

In 1933 the School was transferred to Antwerpen, principal port of the country. At the same time it became the “Prince Leopold Institute of Tropical Medicine” (ITM), from the name of the Prince—later King Leopold III—, who had emphasized the importance of research on tropical diseases. It became also dependant from the Ministry of Colonies. It was devoted to three tasks:

- \* Post-graduate teaching to physicians and veterinarians and, at a more elementary level, to nurses and “agents sanitaires”, From 1945 on this teaching was assumed in separate courses in both national languages, Flemish and French.
- \* Scientific Research. Around 1955 attention was essentially paid to diseases prevailing in the Belgian territories in Africa: trypanosomiasis, malaria, filariasis, leprosy, rickettsial diseases and to medical zoology and mycology.
- \* Medical care. The in- and outpatient departments began growing fast from the time the Institute settled in Antwerpen. Forty beds, mostly over-occupied, were available, with more than 1,000 hospitalizations/year.

A difficult period broke out in 1960 with the independence of the former Belgian colonies in Africa: Zaire, Rwanda and Burundi. The Institute survived, against an adverse public opinion, through the perspicacity and efforts of its Director and Board of Trustees and of a few far sighted politicians, who were aware of the future importance of the newly independent countries. It went under control of the Ministry of foreign affairs and later of

national education. Its field of interest extended geographically and became less exclusively aimed at central Africa.

The steady growth of the ITM in the next years was a direct consequence of the expansion of the universities and of the economic welfare of the golden sixties, which ended suddenly after 1970, with the economic crisis. In 1987 the in-patients department had to be moved to the teaching hospital of the university of Antwerpen, according to the new legislation on health structures. The department of tropical medicine of this later hospital, with ten beds, remains however under the care and responsibility of the internists of the Institute.

In 1991, as a consequence of the federalization of the country and of the splitting up of the Ministry of Education, the ITM, situated geographically in the Flemish speaking part of the country, became dependent, as all universities, of the regional Flemish ministry of education and culture. This entails at the time mainly administrative changes.

In 1992 it was decided to create a scientific advisory board consisting of both Belgian and foreign scientific personalities.

### *The Present*

The ITM is an autonomous institution, with its own board of trustees, independent from the universities or other teaching or research institutions.

It numbers about 240 people on the budget, including 38 with a university degree: physicians, veterinarians and biologists. About 35 further scientists are subsidized by external funding and a variable number of people are working for the institute in tropical countries under contracts with the National Belgian administration for cooperation to development, the European community, the FAO, WHO, ect . . .

The yearly budget from the Flemish community is about 9 million US\$, which is largely insufficient and has to be completed with the own funds of the Institute and by external funding. Still, the global budget of about 15 million US\$ tends to remain in deficit.

The three main initial activities are continued:

### *Teaching*

All courses are post-graduate. A first cycle is intended for physicians who are going to work overseas in tropical countries, mostly for non-governmental agencies. These courses of a six month duration, from October to March, are given separately in French and in Flemish. In the last three years, about 80 physicians per year, half of which Belgians, have been graduated. Only 10 years ago, this figure was twice as large. The other half are essentially people from the European community, but also from outside Europe. Fifteen nations are as a mean represented each year in this course. Interested biologists or pharmacists are occasionally admitted.

The course for veterinarians and engineers in agronomic sciences, with a duration of 9 months, involves about 20 candidates per year and is aimed towards tropical veterinarian medicine and animal production in the tropics.

The course for nurses is the one remaining long term course for this group in western

Europe which explains the large number of candidates. Only nurses with at least one year of professional experience are admitted, in order to avoid unmotivated candidates. The course of a 4 to 5 months duration is given twice a year in French and once or twice in Flemish, according to the number of demands. About 180 nurses graduate each year, a third of which are Belgian while more than 60% of the remainder originate from the European Community and Switzerland.

For a number of years training of executives from and for the third world in the field of health care at the community level has been a major concern of ITM. These courses, at a MSc level, are intended for people with a fair degree of experience in developing countries, both expatriates who make their career in bilateral or multilateral cooperation to development and autochthonous executive staff and researchers. Three courses are presently running:

- \* The International Course in Health Development (ICHHD) a 10 months course in health planification and manegement, alternately in French and in English, which enrolls after selection 40 candidates per year, 80% of which are to be from developing countries and proposed by their governments. They obtain a master's degree in Public Health.
- \* The Master Degree in Tropical Biomedical Sciences (MScBT), a course in disease control in the developing world, with a duration of 12 months and about 20 students per year.
- \* The Master Degree in tropical veterinarian sciences with a possibility of obtaining a PhD.

All together more than 350 diploma's, certificates and master degrees are granted each year.

Several other courses are organized, a.o. refresher courses in tropical medicine, specialized training in medical and veterinarian mycology, a course in clinical epidemiology and an inter-European course in tropical epidemiology.

The Institute organizes or participates in an active way to several courses in developping countries, including a refresher course in medicine (Journées d'actualisation) in Bujumbura (Burundi) and a WHO course on malaria control for central Africa.

Many trainees, mainly from the third world, are finally admitted in the units and laboratories of the Institute, either for short periods in order to acquire specific techniques or for longer periods during which they are supposed to conceive and realize research projects of their own.

### *Research*

Research activities are regrouped in five departments:

- \* Parasitology

The department of parasitology includes the laboratories of protozoology, serology and entomology. Ongoing research is concerned with African trypanosomiasis, malaria,

leishmaniasis and onchocerciasis. The department disposes of an extensive insectary and breeds a.o. mosquitoes, tsetse flies and triatomes. It has also developed a section of molecular biology of protozoa. Recent developments include a.o. the card agglutination tests for trypanosomiasis. Epidemiology and ecogenetics of the quoted diseases are studied in the field in collaboration with other laboratories from in- and outside the institute.

#### \* Infection and Immunity

This department consists of the laboratories of microbiology, including virology and mycobacteriology, the laboratory of mycology and the laboratory of pathology & immunology. The attention goes mainly to STD including AIDS, to Hanta and other hemorrhagic fever viruses, to leprosy and tuberculosis, to hepatitis and mycotic infections. The department participated to the demonstration of the endemicity of AIDS and HIV infection in Africa and cleared up its epidemiology on this continent.

The laboratory of microbiology is a reference center for AIDS of W.H.O. and of the Belgian Ministry of Public Health. It was involved in the discovery of a new HIV detection test and of an atypical variant of the virus. The laboratory also participates to numerous field projects on the epidemiology of AIDS a.o. in Zaire, Kenya, Cameroon, Senegal and the Ivory Coast. It provides assistance in regard to the prevention and control of STD and HIV infection in these countries.

The laboratory of Pathology & Immunology is concerned with mechanisms of cell mediated immunity in parasitic and viral infections and with their role in the induction of tissue damage. Its competence in the field of flow cytometry of lymphocyte subpopulations is recognized.

The laboratory of Mycology is a reference and teaching center on the diagnosis, ecology, treatment and prevention of filamentous fungi and yeasts, both *in vitro* and in the field.

#### \* Animal Health

The department is devoted to animal diseases and husbandry in the tropics. It includes laboratories of helminthology, protozoology and microbiology. Well managed livestock is of paramount importance for the nutrition and development of third world countries. Besides extensive training and educational activities, the department runs and supervises many research and development projects in several tropical countries. The cattle diseases which are the department's main concern include a.o. trypanosomiasis, anaplasmosis, cysticercosis and east coast fever.

In the field of vector control the resistance of arthropods to insecticides is studied together with the molluscicidal effect of native plants as *Ambrosia maritima* and the search for alternative pesticides for impregnating odour baited tsetse screens.

As concerns animal production, the design of new cattle farms, the selection of

appropriate cattle breeds, the artificial insemination of pigs, the breeding of alternative sources of proteins for pigs and poultry, as giant *Achatina* snails and earth worms, belong to the fields of interest of the department.

#### \* Community Health

The department of community health consists of the unit of research and education in public health (PHRTU) and of those of epidemiology and of nutrition. PHRTU has been involved in research and training on the functioning, planification and management of health systems in the developing world for more than 25 years. This research has strongly influenced the health politics of several third world countries including Zaire. Pilot areas have been developed and supervised in Zaire, Cameroon and Congo, which have helped these countries to shape their health policies. Bilateral and multilateral organizations for development, such as the World Bank or WHO have resorted to these models and to the know-how of the department. The unit is nowadays advising ministries of health in three continents, a.o. in Morocco, Thailand and Bolivia, on the implementation of integrated health care services, the advice being based on the concern for optimal utilization of the scarce resources and on community participation. PHRTU is a WHO reference center on primary health care.

The nutrition unit focuses its activities on nutritional education and treatment of malnutrition in children, next to nutrition planning and the evaluation of on-going projects.

The Epidemiology unit is concerned with the development and implementation of conceptual models in the fields of infectious diseases as trypanosomiasis and of antenatal care. It also contributes to the design of statistical and epidemiological studies in collaboration with other laboratories of the Institute.

#### \* Clinical Medicine

The last department regroups research activities in the field of clinical diagnosis and treatment of imported disease, focused on four subjects:

- \* computer assisted descriptive studies of imported diseases.
- \* clinical epidemiology of STD.
- \* staging systems and clinical trials on HIV infected patients.
- \* development of algorithmic approaches for decision making and of self teaching interactive computer programs.

Research activities are supported by a specialized library, dealing essentially with tropical animal and human diseases and with public health. It receives 550 journals, a large part of them from developing countries and its collections include 12,000 books, 18,000 bound journals and 2,000 theses. It has on-line access to data files and an extensive system of in-house reference and CD-ROM files.

Other general supporting services are a.o. the cryobiology laboratory and the above-mentioned insectaries.

### *Medical Services*

In-patients are now taken up in the department of tropical and infectious diseases of the University teaching hospital in Antwerp. The physicians are also in charge of the out-patient department which remains in the ITM buildings and disposes of radiology and echography facilities and of a laboratory specialized in the diagnosis of tropical diseases. They also care for vaccinations and advice to travellers. A specialized travel advice service provides permanently information on precautions and vaccinations to candidate travellers. Patients are mainly nationals going to- or back from the tropics but originate also from the large immigrant population in Belgium. An important STD consultation is run by the laboratory of microbiology.

### *The Future*

A distinction has to be made between imported diseases and travellers health on one hand and support to third world countries in the health field on the other hand. This second objective guides deliberately, though not always explicitly, both training and research activities at the ITM. This implies that research, the results of which can be validated to the benefit of the third world, has priority on more fundamental research, not supposed to be of immediate use for developing countries.

This is in good agreement with our position as an inter-university institution. More fundamental aspects related to parasites or to tropical diseases are the task of the universities as is training in the recognition, treatment and prevention of imported diseases.

The distinction is of course not so absolute and molecular biology, immunology or virology are fields where rather advanced research is now occurring at the ITM, starting however from the requirements of the field.

This philosophy has been gradually developed and the main objectives of the institute will, at least in the immediate future, not much depart from what they are at present:

- \* provide assistance to developing countries by training of their executive staff and of expatriates involved in technical assistance.
- \* transfer technologies to the third world and adapt advanced research and technologies for medical and veterinarian purposes to the conditions of the third world.
- \* give expert advice a.o. on planification and implementation of services for the community in the fields of integrated primary health care, of epidemiological surveillance, of screening for specific diseases, etc . . .
- \* develop new tools for diagnosis, treatment and control of tropical diseases.
- \* provide information and develop standards of excellence in the field of imported diseases to the benefit of travellers and physicians.

Factors that will affect the future are for a part proper to development itself as the epidemiological transition, which is going to change medical priorities in developing countries in the coming decades. More physicians will also become available in the third world which will lessen the need for expatriate doctors but also change the emphasis to the improvement of training of local resources in order to make the most of their work. The training of third world scientists, according to the second objective of the TDR programme, is a practical and ethical priority.

The tropical climate is however an unavoidable reality and its impact on diseases and vectors is there to stay. The epidemiological transition itself can be a factor of risk, as in the case of STD, AIDS or industrial pollution.

Other factors are more peculiar to the industrialized countries. The training of physicians in industrialized countries is less and less appropriate to work conditions of the third world. It is shocking that the same is often true for native third world physicians educated in the same way.

At the Institute of Tropical Medicine, we have observed a steady diminution of Belgian candidates, physicians and nurses. The duration and the requisites of the training required for a departure to developing countries is deterring the candidates, the more that their stay in these countries is nowadays often very short. Other deterring factors are the problems of reintegration of physicians after a prolonged stay abroad. Nurses are so much in demand in industrialized countries that their incentives to make this additional effort are weak.

Factors more specifically related to research are mainly funding problems, as no easily available funding for research in tropical countries is provided, except in the case of universities, from which the ITM is however administratively excluded. Even applied research supposes nowadays costly equipment, difficult to afford for a small institution and with a risk of being under-utilized. Staff limitations in our too small laboratories and frequent absences due to missions abroad disturb the continuity of research. It is finally rather difficult to find young staff members, especially physicians, in these too specialized fields, of limited importance in our own country and offering few perspectives. This entails indirectly a danger of ageing of the staff and of rigidity of the structures.

As far as patient care and advice are concerned, the main problem is to situate the precise place of a specialized institute in a small country with a plethora of physicians, hospital beds and with a high level of diseases in one institution. Imported diseases are on the increase. It would be erroneous to centralize the knowledge on those diseases in one institution. On the other hand the ITM should remain a reference center for difficult cases and for advice to travellers. Imported cases have the advantage of presenting usually with a monopathology, contrarily to the situation in the third world and to be amenable to exploration with the sophisticated technologies of industrialized countries. In so far their study may paradoxically contribute to a better understanding of the same diseases in the tropics.

The future of the Institute will have to take these lines into account. Both research and training must follow step by step the fast mutations of our future world.

Education and training will be diverted more and more towards higher levels, especial-

ly in the field of public health and especially for nationals from developing countries and for a small number of experts from industrialized countries. They should be problem solving, not an easy task when the field is far away. Long term training in our own laboratories should contribute to the staffing for scientific research in the third world.

Training of nursing personnel is, notwithstanding the demand, not really the task of our institute and should perhaps be entrusted to subcontractors. Degrees at a master's level for nurses, should on the contrary make them technically and administratively able to contribute to the training of third world instructors in their own field.

Computer assisted individual teaching holds many promises and offers opportunities for continuous education in developing countries.

A larger part of our teaching should be perhaps be exported, in agreement with local governments, as refresher courses of a few weeks duration.

Teaching on imported diseases is on the other hand, as mentioned above, more the task of the universities than of a specialized Institute. A minimal knowledge on imported diseases should be nowadays included in the curriculum of every physician.

The emphasis of research should still be laid on traditional problems of the third world: trypanosomiasis, malaria, nutrition, management of health services including primary health care, animal production. At the same time close attention should be given to the new challenges: STD, including AIDS, better understanding of molecular biology and immunity of infectious diseases, ailments of acculturation, industrialization and ageing.

The ITM will have to work more closely in the future with universities both in our own and in developing countries. It should also pay attention to the problems of reintegration of young physicians who have spent part of their life in the third world.

Finally we experience a continuous change in the care of patients with tropical ailments, thanks to faster and less invasive diagnostic techniques and to drugs with much shorter administration. Beds which became emptied a few years ago from the usual tropical diseases are now again occupied by AIDS patients, a disease in which parasitological and mycological aspects give evidence that these classical branches of tropical medicine should not yet pass into oblivion, even in our industrialized world.

As a whole the place of the ITM is not disputed at the time being. Its survival and future will depend on its capacity to adapt to the fast and largely unforeseeable evolution of the next decennia and on its ability to define clearly its place in education and research in an industrialized society.