

MUNICIPAL LABORATORY OF BARCELONA*

The creation of the Municipal Laboratory of Barcelona was the fruit of the efforts of a group of people who, not only aware of the scientific and social progress of their period, but also with great insight, laid the foundations of twentieth century Barcelona.

From the second half of the nineteenth century, Catalonia enjoyed a period of economic growth that, together with the introduction of individual hygiene and disease control, accounted for the increase in population. As a result, between 1850 and 1860, several structural changes took place in the former society, such as the rapprochement between coastal and inland Catalonia. The economy, formerly based on vineyard agriculture and the colonial export trade, spread like tentacles throughout Spain, following the paths drawn by the recently constructed rail network. Industry was strongly favoured by the arrival of capital from the sale of certain businesses in the old Spanish colonies of America. The Catalan generation which arose during the demographic boom halfway through the nineteenth century, referred to as the *Renaixença* by Vicens Vives, took its place in public life between 1868 and 1876.

The citizens of Barcelona at this time started to complain about the constraints of the old city and the poor town planning and lack of monuments in the new areas, which led to the official bodies and authorities receiving plans for new projects every day.

During the time Rius i Taulet was Mayor, the plans for the Eixample were implemented. The city wall was demolished and the Passatge Colom was built in its place. Three of the main roads of the Eixample were completed: Gran Via de les Corts Catalanes, Rambla de Catalunya and Carrer Aragó. Moreover, the motion to annexe neighbouring towns was approved.

In 1885, Rius i Taulet became interested in a plan, drawn up by a group of businessmen, to hold a world trade fair in Barcelona. Despite the crisis that took place during the preparation of the fair, Rius i Taulet went ahead, against public opinion.

At that time, Jaume Ferran i Clua, a physician from Tortosa, proposed to Rius i Taulet the creation of a Laboratory to counteract rabies by applying the vaccine discovered by Pasteur at no cost. The awareness of the success of Pasteur, the proximity of the fair, the proposal of Dr. Ferran and the intervention of Dr. Claramunt i Furest led the «Comissió de Governació» to decide, on the second of November 1886, to

create a much more ambitious Microbiological Institution than that proposed by Ferran.

This new decision was also encouraged by professional health groups, who had often complained about the indifference of the Catalan and Spanish authorities towards the new experimental microbiological studies.

There were great epidemic outbreaks during the nineteenth century, especially of tuberculosis. Poverty and a poor diet favoured transmission. The population doubled in 25 years, which had a detrimental effect on the precarious state of urban hygiene at that time.

Dr. Claramunt, probably supported by Dr. Ferran, demanded an institution for microbiological studies from the City Council, which «had always stood out for its achievements».

The project was favourably received by the Mayor, who, on the 5th of January 1887, appointed Ferran as official director of the future «Laboratorio Microbiológico Municipal» (LMM), a position he took up ten days later, as stated in the diploma placed in the Fundació Museu d'Història de la Medicina de Catalunya of Barcelona. The Real Academia de Medicina y Cirugía of Barcelona gave its approval and Dr. Pasteur was informed of the aims of the City Council, the creation of the LMM and the name of the director. He soon replied with a letter of congratulation on all these decisions.

Once the infrastructure of the LMM was established, the scientific studies began. On the 17th of March 1887, the first rabies vaccine of Spain was applied, using Pasteur's method, and, as recorded in the book of vaccines deposited in the museum of the LMM, the patients came from all over Spain. Among them, we can highlight Dr. Claramunt and Pau Casals (who was 9 years old).

At the end of 1886, the death of several Russians bitten by wolves led to a savage campaign against the vaccines of Pasteur. As a result, Ferran adapted Pasteur's primitive method to a very intensive treatment that consisted of:

1. the use of a viral seriate culture for scarifications
2. a single vaccine
3. replacement of all the medullae attenuated by desiccation by a single emulsion of boiled fresh brain
4. reduction of the treatment to 5 days and 20 injections.

Between 1887 and 1892, the LMM contributed to the knowledge of prophylaxis of typhoid fever and prepared a fresh vaccine against smallpox from brains infected by horsepox using Jenner's method. It also undertook the study

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of tuberculosis, a disease of great morbi-mortality in Barcelona at the end of the 19th century.

To confront the social health situation of Barcelona, the Council set up the Institut d'Higiene Urbana Municipal in 1891, led by Lluís Comenge i Ferrer, who is regarded as the father of epidemiology and the history of Medicine.

Comenge is responsible for the initiative and evolution of the Servei Higienic of Barcelona, the introduction of the first household disinfections and the study of urban infective foci. His model of urban hygiene was adopted by many foreign cities.

At the end of 1894, Ferran obtained diphtheria serum from immunised horse serum using Belwing-Roux's method. The treatment was first applied in the Hospital de Caritat of Cartagena and had fewer side effects than that of his colleagues.

Among the last contributions of Ferran as head of the LMM, we can highlight the vaccine against the bubonic plague, which proved to be much more efficient than that of Haffkine, as demonstrated in the Laboratory of Oporto before an international commission.

After a series of events that have never been clarified, Ferran was removed from the LMM. In 1906, Ramon Turró was appointed director and a new approach to scientific research began. On the 30th of March of the same year, the Comisión de Gobernación decreed the unification of the LMM and the «Instituto de Reconocimiento de las sustancias alimenticias», led by Dr. Calvet, in a single institution currently known as the Laboratori Municipal de Barcelona. In 1909, the chemical and bacteriological sections were expanded. Under Ferran, the LMM was admired worldwide, but Turró achieved even more important successes in immunology.

Pi i Sunyer made the first contributions to the study of trophic sensitivity. González explored the mechanisms that regulate and determine anaphylaxis. The studies carried out by Armengué on the antigenicity of lipids were also valuable, as were those of Alomar and Estades, who discovered the volatile toxins of Kock's bacillus. Pere Domingo developed new techniques for staining this bacillus and showed the presence of Negri bodies in rabid brains. Vidal Munné studied the difference between Bang's bacillus and *Brucella Melitensis* and developed a new vaccine against brom.. The LMM was the site of many scientific achievements despite the poor economic support of the municipal authorities.

The LM stood out not only for its success in research, but also for the control of the frequent epidemic outbreaks that shook the city. Shortly after Turró's arrival in 1906, bubonic plague was declared in the recently integrated town of Sant Martí de Provençals. The prompt action of Comenge saved many lives.

In 1909, the first analysis of non-drinking waters was performed, while the Bacteriologic section also became involved in the analysis of oysters, meat and milk.

The skill of the LM technicians was demonstrated in 1911, when they isolated the cholera microbe from the waters of El

Vendrell (Tarragona). A catastrophic typhous plague, which had long been predicted by Turró, who believed it to be associated with the waters of Montcada, took place in 1914. Although several politicians and academicians agreed that the waters were responsible, the outbreak only ceased when their use was forbidden, after the situation had worsened.

In 1923, Calmette, who, together with Guerin, had developed a BCG tuberculosis treatment two years earlier, came to Barcelona and kindly provided a culture with his vaccination strain. The LM set up a section to prepare the BCG. In 1994, it stopped working because of the importation of foreign vaccines.

There was a project for the creation of a research institution that would be led by Duran i Reynals and supported by Rockefeller i Roviralta. The former went to New York to prepare everything but the Civil War frustrated his attempts.

Before the Spanish Civil War, the LM and the Universitat Autònoma de Barcelona collaborated on Microbiology classes. These courses were not merely theoretical but also involved practical classes in all the laboratories and services.

If we omit the 1936-1939 period, which was a disaster for the LM, several researchers then took refuge in the «Laboratorio Experimental de Terapèutica Immunològica» to work on the preparation of penicillin and the first human assay was performed on an elderly diabetic who suffered from septicemia caused by staphylococcus. Even though they were supported by the Institut d'Acolliment, the researchers never stopped attending the LM, because although its activity had ceased, the men and their desire to make their name in the field of research remained.

In the sixties, the LM began to recover and it was organized into three departments: Nutrition, Hydrology and Bacteriology. The former organised several courses aimed at Chemistry, Pharmacy and Medicine graduates, with emphasis on the educational aspects of the LM.

The sensitivity of the population changed the orientation of the LM, increased the chemical control of food, the analysis of extraneous substances like pesticides and the study of contamination by metals, polychlorate biphenyls, dioxins and additives, which led the municipal sanitary authorities to reorganise and modernise the old LM.

The Microbiology Service in 1982 and the Chemical Service in 1985 incorporated the environmental control of water and food. As the disease had been totally eradicated, the old Antirabies Service disappeared.

In 1994, municipal policy proposed the construction of a new building to meet the requirements of new techniques, coming up to the expectations of its founders, who demanded a laboratory worthy of Barcelona.

The LM is now one of the best in Spain and up to the same standard as similar European laboratories, as confirmed in the periodic meetings with foreign researchers. It is the only laboratory that has passed the accreditation tests needed to analyse samples, which require certification by official organisms in the EU and elsewhere.