

Political union through science

The metric system is one of the enduring achievements of the French Revolution. Martin Milton recounts how it was also intended to unite nations.

Today, the name of Charles Maurice de Talleyrand-Périgord is among those famed for political intrigue at the time of the French Revolution. His reputation has always been for clever diplomacy but he also has a strong claim to be the initiator of the metric system. In March 1790, he submitted a proposal to the National Constituent Assembly — the government that had emerged from the French Revolution — that uniformity in weights and measures could be achieved by referring to the length of a pendulum with a period of two seconds as the unit of length. His ambition for what would eventually become the metric system was motivated by science, but Talleyrand went a step further by suggesting that the idea should be developed collaboratively between the Académie des Sciences in Paris and the Royal Society in London. He later wrote: “perhaps it is permissible to see, in this competition of two nations questioning nature together to achieve an important result, the principle of a political union through science.”¹

Unfortunately, the threat of war in Europe derailed his plans, and his proposal for the unit of length was discarded because local variations in the strength of gravity would be too large. Instead, the Académie des Sciences set the metre as one ten-millionth of the quadrant of the Earth measured along the Paris meridian.

However, Talleyrand’s vision of an international system of units as a way to involve “foreign nations and have them agree on a measurement system”² found favour with the members of the Académie des Sciences. The commission that was appointed to develop the proposal for a metric system included several representatives from outside France. One of them, Jean Henri Van Swinden from the Batavian Republic, now part of the Netherlands, later recorded his enthusiasm for the work: “It remains for us to express our hopes for this beautiful metric system to be adopted by all people.”³

Almost 100 years later, in a Europe that had been forced apart by war, 17 nations



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from around the world came together in Paris on 20 May 1875 to sign what is now known as the Metre Convention. The aim of the convention — in the spirit of Talleyrand’s proposal — appears prominently on the first page, and states that the signatories desired “to assure the international unification and perfection of the metric system”⁴ and they undertook “to create and maintain, at their common expense, a scientific and permanent International Bureau of Weights and Measures with its headquarters in Paris”.

This clear and noble-minded ambition for the convention belies the extent of disagreement over the nature of the commitment to which the states would agree. Although establishing an international standard for the metre and the kilogram was a shared goal, the signatory states were concerned that the formation of a permanent organization would incur a commitment to ever-increasing costs. After much discussion — largely facilitated by the representatives from Germany and France, two nations that had been at war less than five years earlier — a compromise was struck. This

ensured that the work required to prepare and distribute the first prototypes of the metre and the kilogram would be carried out by the director of the newly established organization with just two assistants and some technical staff. After completing the work, it was agreed that the staff would be reduced to the minimum needed. Of course, history worked out differently.

The task proved to be more difficult than first foreseen, and the twentieth century brought along new challenges. Inevitably, the number of staff increased over the years. Today, the International Bureau of Weights and Measures (BIPM) has 62 member states and 40 associate states and economies that participate in its work. The president of the Académie des Sciences, Professor Philippe Taquet described it in 2014 as “an organization that is a perfect and magnificent example of a work of peace. The BIPM symbolizes in a unique manner what people are able to achieve when they pool their wills, their knowledge, their talents and their abilities.”⁵

At this time, when many claim that multilateralism is in crisis, we should be reassured by the history of the metric system: it demonstrates vividly that collaboration to address scientific and technical challenges still leads to valuable agreements between nations. □

Martin J. T. Milton  

International Bureau of Weights and Measures,
Sèvres, France.

 e-mail: martin.milton@bipm.org

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