

Advance of metric usage in the world.

A prime requisite of any science is to be able to measure the variables; this requires units of measurement. Scientists universally use the metric system of units. Furthermore, some 90 percent of the world's population now uses the metric system in everyday life, manufacturing, commerce, and trade.

After years of development, the standard meter was officially established in 1799. The caretaker for it, the kilogram, and other metric standards is the International Bureau of Weights and Measures, founded in 1875 and housed in the Pavillon de Breteuil at Sèvres—a few kilometers southeast of Paris toward Versailles.

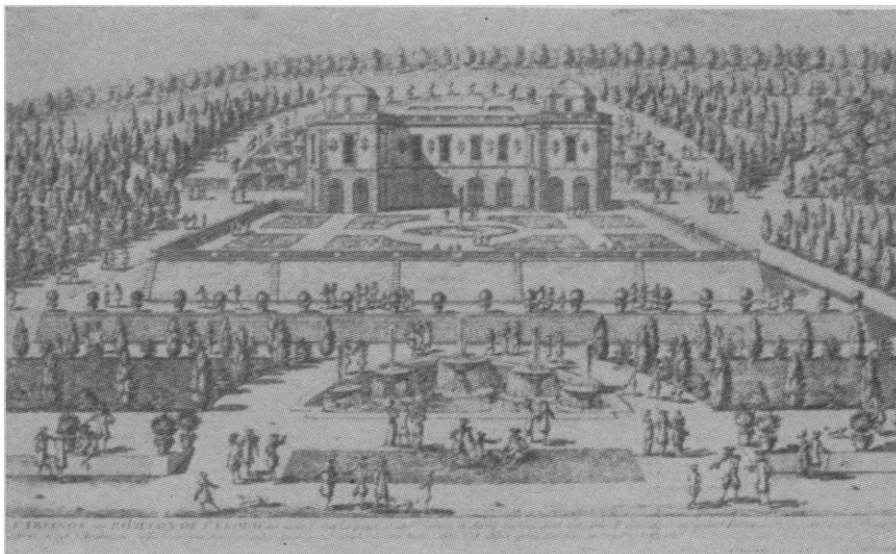
In January 1790, President George Washington invited the U.S. Congress to study the system of weights and measures. His Secretary of State,

Thomas Jefferson, supported the concept of a decimalized system of length. Much later, the Law of 28 July 1866 (H.R. 596) stated that: "... it shall be lawful throughout the United States of America to employ the weights and measures of the metric system . . . ."

Despite this law, the United States continued its hodgepodge of "English" units. In 1965, Britain began seriously considering a stepwise conversion to the metric system with a target for completion by 1975. The British Metrication Board reported [*Nature* 226, 790 (1970)] that a few firms having completed metrication found the investment cost a good deal less than had been feared, the returns being quick and considerable. In January 1970 Jean-Luc Pepin, Canadian Minister of Industry, Trade and Commerce, pre-

sented to Parliament the White Paper on Metric Conversion which stated that adoption of the metric system in Canada was desirable and inevitable. On 27 January 1968 the Parliament of the Irish Republic adopted the metric system, also setting 1975 as its goal for complete metrication. The Australian government announced on 20 January 1970 that it would proceed on metrication. New Zealand's goal is late 1976. If the United States is left desolate, its units should no longer be named "English."

Finally, on 9 August 1968, the Miller-Pell Metric Study Bill (H.R. 3136) became U.S. Public Law 90-472. It did not legislate metrication, but it authorized the Secretary of Commerce (National Bureau of Standards) to submit to Congress by 9 August 1971 a



The Trianon or Pavillon de Saint-Cloud at the end of the 17th century. Its name was changed later to the Pavillon de Breteuil.

full report on the program of investigation, research, and survey in the United States to (i) determine the impact of increasing worldwide use of the metric system; (ii) appraise the desirability and practicability of increasing the use of metric weights and measures; (iii) study the feasibility of retaining and promoting by international use of dimensional and other engineering standards based on the U.S. customary measurement units; and (iv) evaluate the costs and benefits of alternative courses of action which may be feasible.

There are already some very popular signs of metrication in the United States. The TV commercials plug their cigarette "100's"—a handy 100-millimeter unit is already available on many street corners. The tar and nicotine content is declared in milligrams. The Olympics and international athletic events have been metric for years. A 100-meter football field would enhance the goal. Automobile manufacturers are feeling the impact of imported engines by listing some in terms of liters displacement. Grocery packages

are more often including metric-equivalent units on the labels; weights of vitamins and minerals in cereals are always in milligrams. Some chemical manufacturers and pharmaceutical houses have learned the ease of taking the research scientists' metric figures and simply scaling them up several factors of 10 for production in the same units. Doctors prescribe metrically and some record patients' weights in kilograms, heights in centimeters (or meters), and temperatures in degrees centigrade.

The traditional metric system with extension and refinements has been labeled *SI* (Système International d'Unités). It comprises the six basic units: meter, kilogram, second, ampere, kelvin, and candela. Derived units include the newton (force), the hertz (frequency, cycles per second), and the joule (all forms of energy including calories). A sign may read "110 volts, 60 hertz. It hurts!" Ladies will have to watch their jewels and joules.

The symposium, sponsored by the affiliate Metric Association, will have three sessions:

1) *Metrication in Britain and Canada.*

The modern metric system *SI* will be reviewed (J. D. Graham, International Harvester Company), followed by progress reports from Great Britain and Canada (Albert J. Mettler, Director, Canadian Metric Association).

2) *The U.S. Metric Study Bill.*

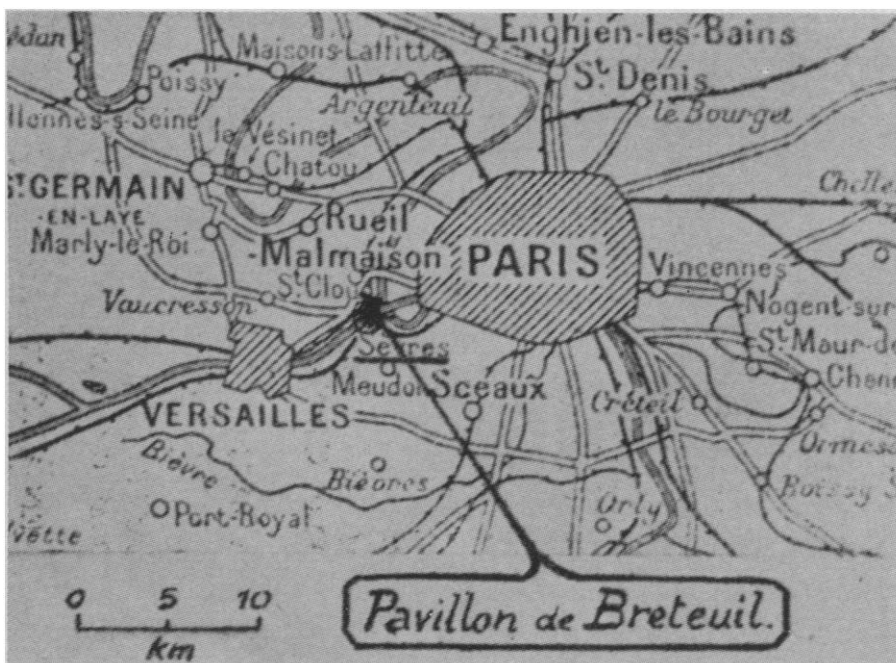
A report on the National Conferences on Engineering Industry will be given (Henry C. Parsons, Vickers Division, Sperry Rand Corporation), followed by a report on progress and preliminary results of national questionnaires (J. V. Odom, Manager, U.S. Metric Study, National Bureau of Standards).

3) *Metrication Progress by U.S. Industry, Education, and the Public.*

Problems on acceptance (John N. Howard, Air Force Cambridge Research Laboratories) will lead into educational challenges in accomplishing goals (John M. Flowers, Science Education, University of Southern Mississippi). Finally, a discussion of the responsibility of the mass media—newspapers, radio, and TV—in metrication (Leonard Reiffel, CBS News) will close the symposium.

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Geographical location of the Pavillon de Breteuil in relation to Paris.