THE 1958 SESSION OF THE INTERNATIONAL COMMITTEE OF
WEIGHTS AND MEASURES

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The ordinary session of the International Committee of Weights and Measures, which took place in Sèvres from September 29th to October 4th, 1958, was attended by the following 15 (out of 18) member nations of the Committee: Australia, Austria, Great Britain, Germany, Holland, Spain, Italy, Canada, USSR, USA, France, Sweden, and Japan.

The major part of the session was taken up by the questions relating to the ordinary 11th General Conference of Weights and Measures which will take place in 1960 and which will consider such important problems as the revision of the Meter Convention, the adoption of a new definition for the meter in wavelengths of light, a more accurate definition of the International Temperature Scale, etc.

In his address, the Secretary of the Committee, Professor Cassini (Italy) gave information about: the changes in the composition of the Committee which had taken place since the previous session (the election by post of K. Krishman, the Director of the National Physical Laboratory of India, to be member of the Committee in place of S. Statescu, Rumania, who had died; and the death of the honorary member of the committee, Professor M. A. Chatelain), the sessions of the consultative committees, and the financial activities during September 1st, 1956 to August 31, 1958.

In his detailed address the Director of the International Bureau of Weights and Measures Ch. Volais and the reports of the members of the Bureau gave information about international work on metrology, and on some research works carried out by the Bureau during the past two years.

The laboratories of the Bureau carried out the checking of the standard meters and kilograms of a number of countries including the national standard-copies, the national standards of the USSR — the No. 11 meter and No. 26 kilogram.

These checks produced the following results:

<table>
<thead>
<tr>
<th>Year</th>
<th>No. 11 standard meter</th>
<th>No. 26 standard kilogram</th>
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<tbody>
<tr>
<td>1889</td>
<td>1 m-0.54 mk</td>
<td>1 kg-0.032 mg</td>
</tr>
<tr>
<td>1957</td>
<td>1 m-0.45 mk</td>
<td>1 kg-0.016 mg</td>
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Certificates were also issued for a considerable number of geodetical tape measures for the Chinese People's Republic.

The density of mercury was determined again and produced the value 13.56948 at a temperature of 17.7°C with an error of the order of $20-30 \cdot 10^{-6}$.

Promising work is being carried out at the Thermometry Laboratory on the development of precision mercury thermometers from melted quartz.

In the Electricity Laboratory regular checks were made of standard resistance coils and of standard cells of eight countries: Great Britain, the German Democratic Republic, Canada, USSR, USA, the Federal German Republic, France, and Japan, against the standards of the International Bureau.

These comparisons and corrections produced the following deviations of the national electrical standards from the standards of the International Bureau:
The Electricity Laboratory carried out research work on the development of a standard ohm from pure metals (platinum and mercury) in vessels at the triple point of water. The standard resistance coils of chromium-gold received in 1951 from the German Democratic Republic showed a good stability. These coils proved more stable in time than manganin coils.

The International Bureau completed the absolute measurements of acceleration due to gravity by the method of free fall; these measurements lasted for several years. The results produced a correction of \( g = -12.8 \) milligal to the Potsdam value. Since a number of other laboratories have carried out and are continuing the measurement of \( g \) the need arises to consider at the 11th General Conference of Weights and Measures in 1960 the question of the constants, which is of great importance for metrology.

In 1957 the International Bureau carried out the checking of photometric lamps from Great Britain, the German Democratic Republic, Canada, USSR, USA, the Federal German Republic, France and Japan. An agreement within 0.5% was found between the light standards of these countries and that of the International Bureau.

The Vice-Director of the Bureau, Professor Terrien reported about an extensive completed research work on interference measurements. New interferometric investigations were carried out which were concerned with the spectral qualities of the best radiation of Kr\(^{86}\) and Hg\(^{196}\). For this purpose and also for measuring the wavelength of these radiations in terms of the red cadmium line, the Michelson interferometer was found to be more accurate than the Fabry-Perot Interferometer, especially after some modifications, including the alteration of the photoelectrical system for the indication and recording of the intensity of the interference fringes. The results obtained were passed on to the Consultative Committee on the Definition of the Meter. This work produced experimental support for the selection of the orange line of Kr\(^{86}\) for the definition of the meter because of its better metrological properties.

Other researches now in progress include the investigation of an interference mano-barometer, the making and checking of optical photoelectrical comparators, and the experiments on the accurate measurement of the refractive index of air by means of a small interference refractometer.

The photoelectric comparator which is on order for the Geneva Physical Society will be fitted with the interferometer made at the Bureau. The Michelson interferometer will be used in direct measurements in wavelengths of gage rods with graduations, end gages, and precision scales. It is intended to make a vibration-free stable support and heat-insulated casing with constant pressure and temperature, in order to ensure the stability and uniformity of atmospheric conditions during the interference measurement of standard lengths.

Ch. Volais reported about a program of international metrological investigations scheduled for the near future. This program includes:

1. Checking of color temperature standards;
2. Checking of standard end gages of up to 1 m in length;
3. Checking of standards of capacity;
4. Work on atomic beams for interference measurements;
5. Determination of the refractive index of air;