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SECTION II.—GENERAL METEOROLOGY.

SHALL WE REVISE OUR NOMENCLATURE FOR THERMOMETRIC SCALES?

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The present standard for exact thermometry is the normal centigrade scale of the constant-volume hydrogen thermometer as defined by the International Bureau of Weights and Measures. The constant volume is one liter and the pressure at the freezing point is one meter of mercury reduced to freezing and standard gravity. The scale is completely defined by designating the temperature of melting ice 0° and of condensing steam 100°, both under standard atmospheric pressure. All other thermometric scales that depend on the physical properties of substances may, by definition, be made to coincide at the ice point and the boiling point with the normal scale as above defined, but they will diverge more or less from it and from each other at all other points. However, by international consent it is customary in most cases to refer other working scales to the hydrogen scale.

Absolute or thermodynamic scale.

To obviate the difficulty which arises because thermometers of different types and substances inherently disagree except at the fixed points, Lord Kelvin proposed that temperatures be defined by reference to certain thermodynamic laws. This course furnishes a scale independent of the nature or properties of any particular substance. The resulting scale has been variously named the absolute, the thermodynamic, and more recently in honor of its author, the Kelvin scale. The temperature of melting ice by this scale on the centigrade basis is not as yet accurately known, but it is very nearly 273.13°, and that of the boiling point 373.13°.

Approximate absolute scale.

Occasions arise with increasing frequency in which meteorologists, physicists, and others in dealing with problems of temperature are required to use an absolute scale or an approximation thereto, and to publish temperature data in those units. It is not convenient, and in many cases not necessary, to adhere strictly to the true thermodynamic scale. In fact, the general requirements of science are very largely met by the use of an *approximate* absolute scale which, for the centigrade system, is defined by the equation

$$T = 273. + t° \text{ Cent.}$$

The observed quantity, $t°$, may be referred to the normal hydrogen centigrade scale or be determined by any acceptable thermometric method. This approximate scale is often called the "absolute" or the Kelvin scale, perhaps for the sake of brevity or convenience. Of course, no one can disregard the technical differences between the real and the false, or approximate absolute scales.

This scale differs from the true Kelvin scale, first, because 273° is not the exact value of the ice point on the Kelvin scale; second, because each observed value of $t°$ other than 0° or 100° requires a particular correction to convert it to the corresponding value on the Kelvin scale. These corrections will differ according to the kind of thermometer used in obtaining the value $t°$, and while they are small for temperatures between 0° and 100° they are large at extreme temperatures and are important in all questions involving thermometric precision.

The *approximate* absolute scale is sufficiently exact for nearly all purposes, it is most convenient in computations and in the publication of results; further, its numerical quantities are strictly homogeneous, and should any necessity arise data published in its units may be readily reduced to the absolute Kelvin scale by simply applying the appropriate correction for the zero point of the scale—about 0.13° C.—and the other appropriate correction to reduce the observed temperature, $t°$, to the true thermodynamic temperature. It is thus clear that much confusion and uncertainty of terminology and meaning would be obviated, and Kelvin's suggestion properly appreciated, if scientists would agree to ***give the approximate absolute scale a particular name of its own*** and reserve the name "absolute" for the scale that is truly absolute, viz, Kelvin's absolute thermodynamic scale.

In accordance with the foregoing ideas, the thermometric scale and nomenclature in the centigrade system may be set forth in the following manner:

Thermometric nomenclature.

AS IT IS.

	Fiducial points.	
Centigrade scale	Freezing point.	Boiling point.
Normal hydrogen constant-pressure thermometer	0°	100°
Thermodynamic scale Absolute scale Kelvin scale Approximate or "near-absolute" scale defined by the equation— $T = 273 + t°$ Cent.	All frequently loosely designated Absolute Scale in scientific literature.	

AS IT SHOULD BE.

Centigrade scale	0°	100°
Thermodynamic scale	273.13°	373.13°
Absolute scale Kelvin scale	Strictly synonymous and strictly one ideal scale.	
"Approximate-absolute (?)"	273°	373°

Let us prevent confusion and uncertainty, make the meaning of scientific writings clear and distinct, by giving an appropriate name to the scale

$$T = 273 + t° \text{ Cent.}$$

Such a name will have the significance of—

Quasi-absolute, symbol Q or A_q.

Approximate absolute, symbol A_a.

Pseudo-absolute, symbol P.

It should be a short word if possible and suggest a good symbol for its abbreviation. The above list of names is tentative and suggestions from others are requested.