present act also as curator of the other divisions. Associate curators **E. C. Leonard, C. V. Morton,** and **E. H. Walker** are assigned to the Division of Phanerogams, and **Paul Conger,** in charge of the Section of Diatoms, is assigned with his collections to the Division of Cryptogams. It is expected that this reorganization will enable the staff working with the collections designated as the U. S. National Herbarium to give them better care and to respond more promptly to the many requests for information received from all parts of the world.

The National Bureau of Standards, in cooperation with the Office of Naval Research, has just published in loose-leaf form the first tables in a new and comprehensive compilation of "Tables of Selected Values of Chemical Thermodynamic Properties," which bring together for the first time all available published data of chemical thermodynamic properties. One set of these tables, which are published in three parts, is being furnished to each university Department of Physics, Chemistry, or Engineering. U. S. Government laboratories, research institutions, and industrial laboratories may obtain one set each on request to the Bureau.

Make Plans for—

American Roentgen Ray Society, September 14–19, Atlantic City, New Jersey.

American Chemical Society, September 15–19, New York City.

Illuminating Engineering Society, September 15–19, New Orleans, Louisiana.

American Institute of Electrical Engineers, Middle Eastern District Meeting, September 23–25, Dayton, Ohio.

American Public Health Association, October 6–10, Atlantic City, New Jersey.

American Academy of Ophthalmology and Otolaryngology, October 12–17, Chicago.

American Association for the Advancement of Science, 114th Meeting, December 26–31, Chicago, Illinois.

COMMENTS *by Readers*

In solar radiation work the unit called the gram calorie per square centimeter per minute is very frequently used; for longer time intervals, such as an hour or day, for example, the gm cal/cm²/hr or gm cal/cm²/day is used, when appropriate. These units are somewhat cumbersome to write and even more awkward to say.

A more convenient unit is therefore needed. According to F. Linke (*Handb. Geophys.*, 1942, **8,** 30) the "langley" has been proposed to designate the gm cal/cm²/min, in honor of Samuel P. Langley, who, as the first director of the Astrophysical Observatory of the Smithsonian Institution, contributed greatly to the study of solar radiation and its depletion by various gases in the earth's atmosphere.

However, in view of the need of considering longer time intervals than a minute, it is herewith proposed that the "langley" be defined as the gm cal/cm², where "gm cal" denotes the 15°C gm cal. It is also proposed that the written abbreviation of "langley" be "ly"; to shorten the word in other ways might tend to confuse it with other units.

Having adopted the new unit we may now speak of the langley per minute, the langley per hour (and so forth), which will be written as ly/min and ly/hour. (L. B. ALDRICH, *Smithsonian Institution, Washington, D. C.*; H. WEXLER and S. FRITZ, *U. S. Weather Bureau, Washington, D.C.*; I. F. HAND, *U. S. Weather Bureau, Boston*; A. COURT, *Office of the Quartermaster General*, and MAJOR W. P. MELLEN, *Air Corps, Washington, D. C.*)

A remarkable set of rainbows was seen from 8:00 until about 8:15 P.M. (C.D.T.) on July 20, 1947, at Urbana, Illinois. The main primary rainbow showed a continuous band of clear color. The most unusual part of this bow was the brilliance of the violet band, which at times exceeded in intensity that of the blue and green bands. From top to bottom the colors in a primary rainbow run: red, orange yellow, green, blue, indigo, violet. Usually the indigo and violet bands are quite faint, whereas in this case they were unusually bright.

A secondary rainbow was very plain, above and outside the arc of the primary bow. In this, as is usual, the order of colors was reversed, with red at the bottom and green above. It is uncommon for the blue, indigo, and violet bands to show above the green in the secondary rainbow, and this was no exception. However, the width of the secondary bow, even without the blues, was about equal to that of the whole primary bow. Between the primary and secondary bows the sky appeared to be lacking in light. It was dark, leaden gray in color.

Beneath and within the curve of the primary rainbow were the so-called supernumerary rainbows, very brilliantly exhibited. Although these are referred to as "familiar" phenomena by W. J. Humphreys in his *Physics of the air* (1920, pp. 456–482), they have never before been seen by the writer or by many other mature persons. In this case the position of the sun, due to the time of day, was almost ideal for rainbow phenomena. The whole band of rainbows appeared to lie within a vertical angle of about 20°, from about 60–40° above the horizon, with the zenith of the bows in a direction about 10° S.E. from the observer. Two supernumerary bands of color beneath the unusually brilliant violet of the primary bow were visible to this observer, and Lt. Col. J. S. Shaplund, C.E., U. S. Army, told the writer that he was able to distinguish still another inner band from his place of observation. The only colors distinguishable in these supernumerary bows were green and red-violet. The bands of green and violet were very narrow, their width being about that of green and blue only

in the primary rainbow. Beneath the primary bow, ending with brilliant violet, were green, violet, green, violet, and green, violet. The first repetition of green and violet was clear over the larger part of the primary bow, but the second and third showed only from time to time and then most clearly near the zenith of the arcs.

Supernumerary rainbows are said usually to show only green and red. They are interference phenomena, and in the case here reported it seems as if the red was superposed over the violet so as to produce the unusually brilliant bands of red-violet even in the primary bow. A complete explanation of these phenomena is presented by Humphreys, as noted above. (TERENCE T. QUIRKE, *Department of Geology and Geography, University of Illinois.*)

Everyone who has had occasion to teach vitaminology must have experienced considerable difficulty with the commonly accepted terminology, both because of the cumbersomeness and because of the incorrect implications of some of the terms used. In the interest of further simplification and clarification, the following suggestions are offered:

(1) Since vitamin A activity results from activation of carotene, it is suggested that "accarene" be adopted as an official name. This term is a condensation which implies nothing as to its physiological action or therapeutic effects; it is a short term, and yet the chemical relations are not too completely obscured. The rather commonly used "axerophthol" is objectionable not only because of its length and rather awkward pronunciation, but more importantly, because it implies one rather superficial and nonspecific therapeutic influence. This is always objectionable, because it implies that the vitamin is of importance only when deficiency occurs.

(2) It is suggested that "ossiferol" be substituted for "calciferol" as a specific designation for vitamin D_2. The objection to the older name is that it leaves out of consideration all reference to the influence of the vitamin on the metabolism of phosphorus in relation to bone. Certainly, this phase of its action is as important, if not more so, than the influence on calcium. "Calciferol" does have the merit of referring to a physiological process but to only a limited part of it.

(3) It is suggested that, since vitamin D_3 is produced by activation of 7-dehydrocholesterol, this latter term be telescoped to "sedesterol." As in the case of vitamin A, there is no implication of chemical nature or of physiological action; the word is euphonious and not cumbersome.

It seems desirable that all names of vitamins be based on (a) chemical composition, (b) physiological rather than therapeutic action, or (c) be distinctive but nonspecific. "Ascorbic" acid is especially objectionable because it refers to a deficiency state rather than to chemical composition or physiological function in healthy organisms. From this point of view, it would be highly preferable to restore the original chemical designation of hexuronic acid.

The above criticisms apply equally well to tocopherol as a designation for vitamin E activity. However, no suggestion is made for any change until its function in the human is better understood. (C. I. REED, *University of Illinois, Chicago Professional Colleges.*)

Book Reviews

Fundamental theory. A. S. Eddington. Cambridge, Engl.: at the Univ. Press, 1946. Pp. viii + 292. 25/-.

This posthumous work of the great British astronomer, which supersedes his *Relativity theory of proton and electron* (Cambridge, 1936) and *The combination of relativity theory and quantum theory* (Dublin, 1943), was prepared for the press by E. T. Whittaker, of Edinburgh University. It represents the clearest expression which Sir Arthur achieved of his theory of the relation of relativity theory and quantum theory and his deduction of the value of certain fundamental constants of nature, such as the masses of the electron and proton, the fine structure constant, the rate of recession of the nebulae, the number of particles in an Einstein universe, and the nuclear-range constant. On pages 66 and 105, and in Chapters IX and XI are set forth the *calculated* values of more than 30 constants of nature, nearly all of which are in most remarkable agreement with experiment. The reviewer knows of no other theory which achieves such accuracy of prediction over so wide a range of physical phenomena.

Since Eddington worked almost completely alone for the last 20 years of his life, the hidden assumptions in his physical reasoning are not always the same as those of more well-known schools of quantum theorists. This accounts for the fact that those who approach his theory after a thorough grounding in more conventional methods find it very difficult to understand and even repellent. Further, since he created his theory by daring intuitions rather than by careful argumentation (as happens with any essentially new theory) and since it seems to require for its adequate formulation much abstract algebra with which Eddington was not too well acquainted, there are occasional gaps and even inconsistencies in the logic of his presentation. However, even though Eddington's arguments are not always convincing, his formulas are related to one another in such an astonishing way, which cannot be explained by chance, and result in the prediction of so many facts in complete agreement with experiment that the reviewer is persuaded that the theory is essentially correct while he admits that the rationale of the dependence of the formulas on Eddington's basic notions is still far from satisfying.

Eddington's reputation as an *astronomer* is already secure. If the above judgment as to the value of *Fundamental theory* proves to be well founded, he will rank with Newton and Einstein as one of those few geniuses who have effected fundamental revolutions in our knowledge of the physical world.

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