

not attracted by the school of E. Mach nor that of the dialectical materialists which is discussed at the end of this volume. Indeed, his theological beliefs were an essential part of his outlook. Not only did they influence his epistemological tenets, but they sustained in him that mixture of dignity and poise which were the outward signs of a lively faith. Through it he triumphed over his personal tragedies and sorrows.

It is instructive to contemplate Planck as a teacher. How different, for example, from Arnold Sommerfeld with his brilliant circle at Munich, where Planck had been at school. No large following developed at Berlin, though the early death of Von Mosengeile robbed science of a pupil of outstanding promise. As with some other master minds, Planck seemed to have needed "co-brilliance" if progress with research students was to occur.

Some of the most interesting material before us is contained in a running conversation between Planck and his friend Hartmann in 1935. They talked about everything on Earth including the preliminaries to atomic fission, in which context Hahn's work became known in 1938. Here indeed was the true philosopher, ready to acknowledge that metaphysics may well advance, if common cause is made with natural knowledge.

A moral of all this is plain, especially for academic critics and reformers. We evaluate university efficiency, productivity and so on at our peril. The sheer achievement of one Max Planck makes nonsense of all attempts to measure the gift of learning, or to force it into Procrustean beds made for more ordinary mortals to sleep in.

F. I. G. RAWLINS

MAPPING WEATHER

British Weather in Maps

Second edition. By James A. Taylor and R. A. Yates. Pp. xv+315. (London: Macmillan and Co., Ltd.; New York: St Martin's Press, 1967.) 50s. net.

THIS book introduces the reader to the most interesting, the most complex, and probably the most expensive document issued daily by Her Majesty's Government—the daily weather report. It is intended for the student rather than for the general reader, and accepts what is surely one of the soundest pedagogical principles, that to achieve some degree of *rapprochement* with numerical material the student must be encouraged to manipulate it himself. Twenty selected weather situations are presented with admirable clarity and a method is illustrated by which each complex picture may be broken down into some of its component parts. No really specialized knowledge is called for, but patient application is assumed and it is surely hoped that both interest and some degree of awareness will follow. That this is not, in fact, the way our forecasters work is entirely irrelevant. Their job is done before the report goes to press.

For the first 240 pages the page-numbering of the second edition is identical with that of the first and the situations analysed are unchanged. The two editions can therefore be used together in class. Many of the upper-air insets have been improved, however, as also have a number of the explanatory figures in the text. A new chapter on "Classifications of British Weather and Climate" has been added, although the impression left on me is that the exercise, however desirable, still seems to be both exasperating and, at second hand, unrewarding. The fun is in the attempt rather than in the achievement.

It is a sad comment on rising costs that the price of the present volume is well over twice that of the original edition, though that was certainly remarkable value for money.

P. R. CROWE

CORRESPONDENCE

How Insects Hear

SIR,—An evolutionary thought on the variety of hearing organs in nocturnal insects.

In days of old and insects bold
(Before bats were invented),
No sonar cries disturbed the skies—
Moths flew uninstrumented.

The Eocene brought mammals mean¹
And bats began to sing;
Their food they found by ultrasound
And chased it on the wing².

Now deafness was unsafe because
The loud high-pitched vibration
Came in advance and gave a chance
To beat echolocation³.

Some found a place on wings of lace
To make an ear in haste⁴;
Some thought it best upon the chest⁵
And some below the waist⁶.

Then Roeder's key upon the breeze
Made Sphingids show their paces.
He found the ear by which they hear
In palps upon their faces⁷.

Of all unlikely places!

Yours faithfully,
J. D. PYE

Department of Zoology,
King's College, Strand, WC2.

¹ Jepsen, G. L., *Science*, **154**, 1333 (1966). Early Eocene Bat from Wyoming.

² Griffin, D. R., *Listening in the Dark* (Yale University Press, New Haven, 1958).

³ Roeder, K. D., and Treat, A. E., *Amer. Sci.*, **49**, 135 (1961). The Detection and Evasion of Bats by Moths.

⁴ Miller, L. A., and MacLeod, E. G., *Science*, **154**, 891 (1966). Ultrasonic Sensitivity: a Tympanic Receptor in the Green Lace Wing *Chrysopa carnea*.

⁵ Roeder, K. D., and Treat, A. E., *J. Exp. Zool.*, **134**, 127 (1957). Ultrasonic Reception by the Tympanic Organ of Noctuid Moths.

⁶ Belton, P., *Nature*, **196**, 1188 (1962). Responses to Sound in Pyralid Moths.

⁷ Roeder, K. D., Treat, A. E., and Vandeberg, J. S., *Science*, **159**, 331 (1968). Auditory Sense in Certain Sphingid Moths.

New Name for the Kilogram

SIR,—Attention was drawn by C. W. Allen (*Nature*, **218**, 209; 1968) to the absurdity of having the multiple name kilogram for a fundamental unit in the SI system of units. After a search through the alphabet, new names and symbols for the kilogram were suggested—bar(r)am, qur(r)am, abbreviated b or q—for a smoother introduction of the SI system. The author pointed to the possibility of confusion with other well used units and prefix symbols and, in particular, rejected the symbol k.

I agree with Allen's objections to the name kilogram. However, I do not see a real chance that these new names will ever be accepted, since they too completely abandon the currently used symbols and names. I therefore suggest the alternative that "kilo" should be chosen as the name for the unit and k as its abbreviation. Fractions and multiples should be formed in the standard way: mk (millikilo) for g, μ k (microkilo) for mg, and, consequently, kk (kilokilo) for a thousand kg. The unit k, used by itself, could not cause confusion with the prefix k, as prefixes are not used alone. Nor does confusion arise between m as a unit and m as a prefix. In mm the first and second m have different meanings. Nobody feels embarrassment

about this ambiguity. The same could hold for k as a multiple prefix and k as a weight unit, notwithstanding their identical pronunciation in kk.

This proposal bears an easier relation to current use of weight units than Allen's. An additional merit in the chemical and related fields, both of Allen's and my proposals, would be the elimination of the existing impractical imbalance between weight units and (allowed) volumetric litre-units. Instead of assigning to one μ l. of water a weight of an mg, one should now call it a μ k, ml. would correspond to mk, l. to k:

Weight (now)	kg	g	mg	μ g
Volume	l.	ml.	μ l.	nl.
Weight (my proposal)	k	mk	μ k	nk

I fully realize that the SI system has been accepted internationally since 1960, but Britain's change to the metric system could offer the opportunity to reconsider it.

Yours faithfully,

P. J. GROENEN

Central Institute for Nutrition and Food Research TNO,
Zeist, The Netherlands.

The Symbol μ

SIR,—In 1857 an astute young botanist of Holland, Willem F. R. Suringar (1832–98), solved a problem of microscopy. By inventing the symbol μ he established the metric unit for microscopical measurement. In his *Dissertatio botanica inauguralis continens Observationes phycologicas in Floram Batavam* (1857), he wrote “mensuras designavi partibus decimalibus millemetri eujum partem millesimam littera μ notavi” and “ μ millemetri pars millesima”. Later, in his *Algae Japonicae* (1870), he re-stated his unit of microscopic measure as the micron (1 m.m.m.) or 1μ . Very simple as this seems now, it was a brilliant innovation. This Greek letter, as I learn from Dr W. T. Stearn, to whom I am indebted for the historical verification, had not been used before with scientific connotation, though the large Greek M had a numerical value of 40 assigned to it in classical times. Previously microscopic measurements had been in fractions or decimals of a line (twelfth of an inch), which varied slightly from country to country. Sand-grains, human blood-corpuscles, hairs of varying calibre, and so on, had been used for comparison. The innovation standardized measurement with such elegance that it was gratefully and universally received. It has been taught in all schools of biology and geology to the present time and it has been employed in all books and periodicals dealing with such measure.

It comes as a surprise, therefore, to learn that this common, international acceptance of unquestioned priority is omitted in leaflets recently issued in advocacy of the *Système International d'Unités*. Instead, the symbol μ is used in a different sense as an adjectival abbreviation for “micro” meaning a millionth, and the thousandth of a millimetre is symbolized as μ m. Enquiries elicit no explanation but reveal a disturbing ignorance. Physicists and engineers, it is said, have used μ in the sense of “micro” for some twenty-five or thirty years, having modified apparently the traditional use. Biologists have generally little idea whence this came. International biological unions seem not to have been consulted.

It is even more disturbing to read that editors are advised to enforce the use of the ugly and superfluous μ m. It is a weakness, and suspicion arises that it is not to assist the minds of men but to mechanize their thoughts for the convenience of machines. Presumably those of us who have taught and used μ in the traditional sense all our lives are expected to break with a vast heritage of currently used literature, apologize for our precocity, and teach that the micron is unmetric: yet we may well

outnumber the advocates of the micrometre. There is not much convention that international science agrees upon other than priority, and the truth will out. By itself μ is the metric micron. We are continually asked to shorten our scripts. This was and is an approved way.

Yours faithfully,

E. J. H. CORNER

91 Hinton Way,
Gt. Shelford, Cambridgeshire.

Announcements

The following have been elected officers of the American Geophysics Union: President, **Professor H. E. Landsberg**, research professor at the University of Maryland's Institute for Fluid Dynamics and Applied Mathematics; Vice-President, **H. E. Newell**, associate administrator of NASA; General Secretary, **C. A. Whitten**, chief research group of the Coast and Geodetic Survey, ESSA, Rockville, Maryland.

Dr L. J. Morris of the Unilever Research Laboratory, Colworth House, Sharnbrook, Bedford, has been awarded the **Colworth Medal** for 1967 in recognition of his work on the development of new techniques in the identification of fatty acids.

The **International Union against Cancer**, with the funds provided by the American Cancer Society, is to award fellowships for research on cancer. The awards will be given to experienced investigators who have shown their ability for independent research and who wish to broaden their experience by a period of study at a single institution in another country. Further information can be obtained from the International Union against Cancer, PO Box 400, CH-1211, Geneva 2, Switzerland.

CORRIGENDUM. In the communication “Psycho-active Drugs, Exploratory Activity and Fear” by R. Kumar (*Nature*, 218, 587; 1968), the sentence beginning on the third line of the second column of page 587 should read: “Among the drugged animals, only the dexamphetamine group was significantly less active than its unshocked control ($P < 0.01$)”.

CORRIGENDUM. In the article “Upper Miocene Primates from Kenya” by L. S. B. Leakey (*Nature*, 218, 527; 1968) reference 7 should read: “Hopwood, A. T., *J. Linn. Soc. (Zool.)*, 38, 437 (1933)”.

ERRATUM. In the communication “Inducing a Preference for Morphine in Rats without Premedication” by R. Kumar, H. Steinberg and I. P. Stoleran (*Nature*, 218, 564; 1968), the sentences beginning on the fifth line of the second column of page 565 should read: “Daily choice trials were continued for several weeks and both groups regularly drank significantly more than 50 per cent of their liquid intake in the form of morphine solution (for example, for trials 19–28, $t = 3.77$, $P < 0.01$). The average dose of morphine drunk on choice days amounted to approximately 30 mg/kg”.

ERRATUM. In the communication “Dark Reactivation of Damage induced by Ultraviolet Light in Mammalian Cells *in vitro*” by Masakatsu Horikawa, Osamu Nikaido and Tsutomu Sugahara (*Nature*, 218, 489; 1968) the footnote to Table 1 should read “Ten minute counts; background was about 2.5 c.p.m.” (not 25 c.p.m.).

ERRATUM. In the communication “Uranium in Fallout Particles” by T. Matsunami and T. Mamuro (*Nature*, 218, 555; 1968), the sentence beginning on the twelfth line of the second paragraph should read: “Fig. 1 shows an α -ray spectrum of 230 hot particles from the ground from the fifth Chinese explosion (December 28, 1966). The background, taken to be the α -ray spectrum of a blank specimen prepared by the same procedures, has been subtracted”.