

welfare workers and a stimulation for the activities of the city for the year 1915. This Portland 1915 conference will be similar in scope and method to the Reed College conference on the conservation of human life held last May.

A NEW edition of "Les observatoires astronomiques at les astronomes," first published in 1907, is in course of preparation, under the direction of members of the Royal Observatory of Belgium, with Professor P. Stroobant as chairman. He will be glad to receive information from directors of observatories and private astronomers concerning their work and publications.

UNIVERSITY AND EDUCATIONAL NEWS

THE College of Agriculture and the Mechanic Arts of North Carolina is preparing to celebrate on the first three days of October the twenty-fifth anniversary of the first opening of the college. A tentative program has been adopted at a meeting held in the office of Governor Locke Craig, who is *ex officio* chairman of the board of trustees and at the head of the advisory committee which is cooperating with the committee of arrangements. In order to make the quarter-centennial celebration a complete success, efforts will be made to have in connection with it reunions of the twenty-two classes which have so far been graduated. There will also be social meetings, addresses by some of the distinguished men who took part in the founding of the college, and other interesting features. The celebration proper will take place on the morning of October 3, with the principal addresses, but the other meetings will not be at all lacking in interest. Guests who will be held in special honor throughout the celebration will be those who took part in the movement which resulted in the founding of the college.

THE faculty and students of the University of Pittsburgh held a banquet on February 25.

AT the end of the current college year, Dr. Albert Benedict Wolfe, head of the department of economics and sociology, will withdraw from the Oberlin faculty in order to accept the headship of the department of sociology and economics in the University of Texas.

PROFESSOR O. PERRON, of Tübingen, has accepted the professorship of mathematics at Heidelberg, as successor to Professor L. Koenigsberger.

DISCUSSION AND CORRESPONDENCE

STANDARD UNITS IN AEROLOGY

IN SCIENCE, January 2, 1914, p. 31, it is stated that Blue Hill Observatory would use the new units for atmospheric pressure and temperature, *i. e.*, the units proposed by Köppen at Monaco in 1909 and again by V. Bjerknes at the Vienna meeting of the International Commission for Scientific Aeronautics, 1912. In this system, pressure is expressed in bars or decimal parts thereof, such as decibar, centibar and millibar. One million C.G.S. units constitutes a bar.

Professor A. E. Kennelly, visiting this observatory, called attention to the inconsistency of such use of the term "bar." Unknown to meteorologists at home or abroad, apparently, the bar has been defined and used with a different value. Professor T. W. Richards in 1903,¹ suggested that the pressure of a dyne per square centimeter be called a bar;² and while investigation shows that somewhat similar suggestions had been made by others, Richards's was independently made, original and legitimately deduced. Kennelly³ and others following Richards have used the bar in this sense. It has therefore priority of definition and usage and is moreover the logical and appropriate unit of pressure. For the unit proposed by the aerologists, a more fitting designation would have been "aer" or "atmos."

Unless some protest be made against the proposed bar of the aerologists, we add to the confusion of units and terms already existing in meteorology. It is important too that we

¹ Publication 7, Carnegie Inst., 1903, p. 43.

² "New Method of Determining Compressibility," T. W. Richards and W. N. Stull, *Jour. Am. Chem. Soc.*, Vol. XXVI., April, 1904.

³ "Convection of Heat from Small Copper Wires," A. E. Kennelly, C. A. Wright and J. S. Van Bylevelt, *Trans. Am. Inst. Elec. Engineers*, June, 1909.

make the correction *now* at a time when we are trying to break away from the old order, attempting to introduce rational units in place of the old arbitrary ones. It is somewhat embarrassing for one who has advocated the introduction of absolute units to acknowledge the validity of the criticism of chemist, physicist and engineer; but fortunately the corrections can be made readily by changing the millibar of the aerologist to kilobar. In the conversion tables which are in course of preparation, this will be done.

Briefly, the term "barad" was proposed by a committee of the British Association for the Advancement of Science, 1888, as a suitable term for the unit of pressure, one dyne per square centimeter. Some years later Ostwald advocated the use of one million of these units as the standard, but gave the standard no name. The term *bar* was proposed by Richards in 1903 for the small unit of pressure, one dyne per square centimeter; and *megabar* for a C.G.S. atmosphere. So far as I can ascertain this is the first case in which a clear-cut definition of an absolute atmosphere has been used in actual investigation. He has consistently used this unit megabar as the basis of his work ever since. Richards's atmosphere is 0.987 of the ordinary sea-level atmosphere or 1.020 kilograms per square centimeter; and under the new order agrees with the standard level of Köppen, the million-dyne level at about 106 meters elevation.

It seems almost unnecessary to argue that the smaller bar should be the basic unit and not some multiple. And again it is doubtful if bar is the best designation for the pressure of an absolute atmosphere. Megabar is not altogether inappropriate and has priority of usage especially in the literature of chemistry. A megabar in the aerologist's notation would be the pressure of a million atmospheres, a magnitude not often dealt with. On the other hand, we often need to refer to pressures smaller than the millibar of the aerologist. The bar of the chemist and physicist is conveniently divisible down to its millibar, *i. e.*, a thousandth of a dyne per square centimeter.

The following table contrasts the two sys-

tems. At Dr. Richards's suggestion it is restricted to those terms most likely to be used.

| Chemist's and Physicist's (to be Universally Used Hereafter) | Former Aerologist's (to be Abandoned) | Remarks |
|--|---------------------------------------|---|
| | 1 megabar | One million atmospheres, far beyond our present possibilities of direct measurement. |
| 1 megabar | 1 bar | The absolute atmosphere; equal to 750.1 mm. mercury or .987 usual sea-level atmosphere. One megadyne per square centimeter acting through one cubic centimeter does one megerg of work. |
| 1 kilobar | 1 millibar | One kilodyne per square centimeter. |
| 1 bar |? | One dyne per square centimeter acting through one cubic centimeter does one erg of work. |

There would be no objection to giving the term megabar or absolute atmosphere some convenient nickname such as "aer" if megabar is too ponderous. It has been suggested by Professor Richards that for historical reasons the pressure of 10,000,000 dynes (ten absolute atmospheres) might be named after some pioneer in meteorology, as Guericke or Torricelli, after the analogy of the "watt," "joule," "ampere," etc., but this need not be insisted on at present.

ALEXANDER MCADIE

BLUE HILL OBSERVATORY,
February 28, 1914

ACADEMIC ELECTIONS

TO THE EDITOR OF SCIENCE: In connection with the table of percentages accompanying my article on "Academic Student Elections," in SCIENCE for January 16, a correspondent has called my attention to some inaccuracies in copying percentages from Professor Ferry's tables, on which the article was based. With one exception they do not seem very important. This exception is in connection with the work in biology at Bowdoin College. The entry was from the wrong column of Professor Ferry's extended table, and to Bowdoin was assigned the lowest record in this subject. A

Science

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Science **39** (1002), 391-392.
DOI: 10.1126/science.39.1002.391-a

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