

hand, between the *Heliozoa* and the *Radiolaria*. This, of course, need make little difference. The slime-moulds are "mouthless and gutless" and should go anywhere with that set. From just which, however, of the "mouth-bearing, gut-hollow" creatures such graceful forms as *Arcyria* and *Lamproderma* have descended will no doubt be made clear on some future page!

Such is the sort and kind of finished scholarship with which it is now sought to align American botanists.

But really does it much matter where these things are placed? For 150 years they have been handled by the botanist. If they are now to go to the zoologist, or the chemist, he must show some reason for his claim. Some day, refined research, perhaps by methods not now devised, will show more clearly lines of descent and so of genetic kinship. That day is not here yet—so far, at least, as is to be learned from authorities herein cited.

Meantime, it may be said in conclusion, the great collections on which the Oxford professor and his pupils have so gratuitously toiled, still occupy probably an honored alcove in the *herbarium* of the British Museum.

T. H. MACBRIDE

IOWA CITY,
April 13, 1912

SCIENTIFIC BOOKS

Meteorology, a Text-book on the Weather, the Causes of its Changes and Weather Forecasting, for the Student and General Reader. By WILLIS ISBISTER MILHAM. The Macmillan Company. 1912.

As the author of this latest treatise on meteorology is a most popular professor of astronomy in Williams College it is natural that this book shall bear all the characteristics of an admirable text-book for class use. It is also intended for the general reader. It starts at the beginning and must be intelligible to all, but it has abundant references to current literature for the use of those who wish to study further. The author has not attempted the history of the science, nor the relations of climate to disease or plants, nor has he

laden his pages with heavy mathematical work nor with a dozen other special items that would be included in an encyclopedic treatise. Professor Milham's book is simply an enlargement of the lectures which he has been giving for the last eight years in Williams College which aims to give its students a broad education in languages and sciences that have to do with our every-day life. The genial generosity of the author is shown by his painstaking acknowledgment of every authority from whom he quotes and one might imagine the book to be a compilation were it not for the many good ideas originating with the author. As a popular text-book it is admirable and fills a want distinct from that which is satisfied by the excellent work of Davis. After four hundred pages devoted to the atmosphere and the weather bureaus the author adds a hundred pages, as part two, devoted to the climate, the floods, electric, optic and acoustic phenomena.

The great utility of reliable forecasts has undoubtedly always been an incentive to all mankind and throughout all ages to apply our crude scientific knowledge to the study of the atmosphere, but since the days of Galileo the love of knowledge for its own sake—the love of research into the hidden things of nature has been a characteristic of civilized man. The conflict between darkness and light, the contest between superstition and intelligence, the fight between conservatism and progress has nowhere been so persistent as during the past forty years and in the field of meteorology. Professor Milham is quite correct in saying that there is no subject wherein ignorance and superstition are more nearly universal than in connection with the weather. Perhaps we can not blame the well-educated citizens for a certain amount of ignorance since so little is taught about meteorology either in high schools or colleges. Apparently another century must elapse before courses of laboratory experimentation have been devised for use in our higher schools of science.

Our subject begins with the constitution of the atmosphere considered as a mixture of several gases and vapors; these are warmed by

the sunshine and cooled by the radiation of heat; the upper layers of the atmosphere have both heat and moisture carried upward into them by convection, namely, by air that ascends from near the earth's surface: on the other hand the lower atmosphere is slightly cooled by the descent of an equivalent mass of the upper air. Of course radiation of heat from the atmosphere and the earth outwards goes on continuously, whereas convection is spasmodic; hence, the distribution of temperature is a regularity that is modified by many irregularities. The annual and the diurnal periods and the irregular variations of heat are appreciated by every one as is also its diminution with altitude. The barometric gradient is generally regarded as the cause of the motions of the atmosphere, but the rotation of the earth on its axis modifies these winds in such a way that northerly winds become northeast and southerly winds become southwest and so on around the circle. Of course the atmospheric pressure has its regular annual and diurnal variations and its irregular ones also, as well as its diminution with altitude. The regions of high pressure on the earth's surface are also regions of descending dry and dense air, whereas the regions of low pressure are those toward which the air is blowing and are the ordinary storm centers. The general circulation of the atmosphere is maintained by such barometric differences far above the earth's surface as well as at sea level: these are complicated with the large differences of the highs and lows of the barometric pressure that maintain our storm areas. The paths of these areas are shown by Milham in small maps prepared by several different persons—Bigelow, Van Cleef, Bebb, Loomis, Russell. The attempt to predict the path of any area of high or low pressure is the fundamentally difficult problem of the forecaster and is one to which considerable attention is given in Professor Milham's book. The volume is illustrated by 157 illustrations and fifty charts and a number of numerical tables. A brief summary shows that Milham's meteorology is a work destined to be eminently useful, both to the teacher and to

the general reader. The publishers have spared neither money nor pains in order to make this beautiful volume acceptable to the author, the teacher and the student.

C. A.

Probleme der physiologischen und pathologischen Chemie. Fünfzig Vorlesungen über neuere Ergebnisse und Richtungslinien der Forschung für Studierende, Aerzte, Biologen und Chemiker, von DR. OTTO von FÜRTH, A. Ö. Professor für angewandte medizinische Chemie an der Wiener Universität. I. Band, Gewebeschemie. Leipzig, Verlag von F. C. W. Vogel. 1912. Pp. xv + 634.

This is neither a systematic text-book, an encyclopædic compilation of facts, nor a mere epitome of current theories or methods—it is quite different from other recent publications in this field of science. Physiological chemistry has been the subject of an exceptionally large number of useful handbooks and comprehensive monographs on special topics, all published in very recent times and useful as works of reference. Here at length is a book which can not only be "tasted" or "swallowed," but even "chewed and digested," according to the Baconian classification. Assuming a familiarity with at least the elements of biochemistry on the part of every reader and making no pretense to cover the field with uniform completeness or comprehensiveness in every chapter, Professor v. Fürth has furnished a readable volume of refreshing novelty.

We are in danger, in present-day science, of becoming the slaves of system. These new lectures break away from some of the current tradition in respect to form and appeal to him who is not so much in search of organized literature as of inspiring viewpoints. The justification for this series of essays on the accomplishments and tendencies of the chemical physiology of these days—essays unhampered by the conventional text-book requirements—is well expressed by the author.

Ich vermag mich niemals eines Gefühles von Neid zu erwehren wenn ich zum Beispiel Briefe