

a popular scientific program on Friday evening, and a conference on Saturday afternoon with teachers in Brooklyn schools to consider how the Botanic Garden may become most useful to the schools in connection with their teaching of botany, nature study and geography. About fifty papers have been offered for the scientific programs. The principal address on Thursday evening was delivered by Professor John M. Coulter.

THE D. O. Mills Expedition to the Southern Hemisphere, sent from the Lick Observatory and maintained at Santiago, Chile, for a number of years past by recurring gifts from the late D. O. Mills and Mr. Ogden Mills, is now to be continued for another five years, subscriptions for this purpose of one thousand dollars per annum each having been made for five years by Mr. Ogden Mills, Mr. William H. Crocker, Mr. F. W. Bradley, Mr. A. B. Spreckles and Mrs. William H. Crocker, and of one thousand dollars each for 1917-18 by Mr. W. B. Bourn and Mr. Gordon Blanding.

WE learn from *Nature* that the agricultural institute of Alnarp proposes to devote a plot of its land and about £4,000 to the erection of a building for studies in heredity, under the direction of H. Nilsson-Ehle, the recently appointed professor at Lund. It will also provide a maintenance grant of £200 per annum. It is felt that such studies are of the greatest importance at this time, when Sweden is thrown on its own resources in the matter of food production, and the institute is convinced that any material sacrifices it may make for this purpose will be more than repaid by the economic results of the research, on which the institute will naturally have the first claim.

UNIVERSITY AND EDUCATIONAL NEWS

THE new laboratory for chemistry at the University of Cincinnati was opened on April 7. The ceremonies took place at McMicken Hall, Judge Rufus B. Smith presiding. Mr. Emil Pollak made the formal presentation of the building. Dr. Lauder W. Jones replied on behalf of the department of chemistry, Dr.

John Uri Lloyd on behalf of the American Chemical Society. The main address was made by Dr. Chas. E. Herty, who spoke on "The Swing of the Pendulum in Chemistry." A dinner, arranged by the Cincinnati Section of the American Chemical Society, was given at the Gibson.

THE valuable engineering library of the late Robert Gillhan, of Kansas City, Mo., has been donated by his sister-in-law, Mrs. Albert Marty, to Drury College, Springfield, Mo. Among the collection of books are complete files of the chief engineering journals of America, handsomely bound in three-quarter Russian.

SEVERAL teaching fellowships in anatomy (including histology and embryology) and physiology (including physiological chemistry) have been authorized in the University of Minnesota, Minneapolis. These fellowships are renewable for a three years' term, with successive annual stipends of \$500, \$600 and \$700, and lead to the degrees of M.A. and Ph.D. in the graduate school.

THE trustees of Toledo University in special meeting on April 10 refused to accept the resignation of Professor Scott Nearing, dean of arts and sciences, formerly of the University of Pennsylvania.

THE necessary alterations have been made to enable the department of anatomy at University College, London, to be opened for the reception of women medical students next October.

THE George Washington University Medical Society, composed of the alumni and faculty of the medical school, at a recent meeting elected Dr. W. Ashby Frankland, president; Dr. Coursen B. Conklin, vice-president; Dr. Thomas Miller, secretary, and Dr. Edward G. Seibert, treasurer.

DR. WILLIAM DUANE, physics, and Dr. Walter F. Dearborn, psychology, have been promoted to full professorships in Harvard University.

DONALD FRASER McLEOD, assistant professor of civil engineering at the University of Mis-

Mississippi during the last four years, has been promoted to be professor of municipal engineering.

MR. D. KEILIN, of Magdalene College, Cambridge, has been appointed assistant to the Quick professor of biology.

DISCUSSION AND CORRESPONDENCE

THE RÔLE OF BOYLE'S LAW IN CLINICAL SPHYGMOMANOMETRY. A REPLY TO A. M. BLEILE

In a paper read before the American Physiological Society Dr. Bleile¹ discusses an application of Boyle's law which I made in developing the theory of the oscillations of pressure produced in the compression chamber of a sphygmomanometer by the arterial pulse.² My statement of this law, worded so as to fit the conditions obtaining in my experiments, was as follows: "... the rise of pressure determined by the addition of a given volume of incompressible material to a confined, gas-filled space is proportional to the pressure of the gas filling the space." Dr. Bleile illustrates the action of the law by paraphrasing the example in my paper thus:

With a given volume pulse change, if the arm band pressure is at 100 mm., the pulse wave shown by the arm band manometer would be *only half as great* as it would with the same volume pulse but with the arm band pressure at 200 mm.

He then goes on to say that upon testing this hypothesis by the help of a suitable physical model it is demonstrated that such is not the case. On the contrary, it is demonstrated that the oscillations of volume occupied by a given mass of gas produce inversely proportional oscillations of absolute pressure. Or, in other words, the absolute pressure of a given mass of gas is inversely proportional to the volume. . . . Therefore, the results of the present work are in harmony with Boyle's law but are contrary to Erlanger's hypothesis.

This statement would lead one to suppose

¹ "An Application of Boyle's and Avogadro's Law to the Oscillations of the Manometer in Clinical Measurements of Blood Pressure," *Am. Jour. of Physiol.*, 1917, XLII., 603.

² "The Mechanism of the Oscillatory Criteria," *Am. Jour. of Physiol.*, 1916, XXXIX., 401.

that in my application of Boyle's law I have committed the mistake of making the relation between pressure and volume a direct instead of an inverse one. This, however, is not the case. If my statement of the law is compared with Dr. Bleile's, it will be found that in this respect there is not the slightest difference between them. Thus, to paraphrase my statement so as to make it conform with Dr. Bleile's, "the addition of a given volume of incompressible material" *reduces* the volume of the given mass of gas; this reduction causes a "*rise* of pressure," which "is proportional to the (initial) pressure of the gas filling the space." In this statement the relation between volume and pressure (italicized) obviously is an inverse one. What evidently confused Dr. Bleile is the introduction into my statement of the word "proportional" for the purpose of expressing the relation between the *initial pressure* of the confined gas and the *final pressure* developed upon reducing its volume. That this relation is correctly expressed can easily be, and has been, confirmed by the use of very simple apparatus.

Having made it clear that there is no discrepancy between my and Dr. Bleile's statements of Boyle's law, I now desire to add that Dr. Bleile is right in criticizing my *example* of the application of the law. For I inadvertently employed in the example the pressures read directly from the mercury manometer instead of the absolute pressures, though, in the form in which Dr. Bleile repeats it, the example is in perfect accord with Boyle's law, if it is understood that the pressures are absolute. The failure to express the pressure in absolute terms affects, however, only the magnitude of change, not its sign, and therefore does not alter in any material way the development of the theory of the compression oscillations; for my only object in invoking Boyle's law was to show that under the particular set of ideal conditions premised, namely a rigid compression chamber, a compressible transmitting medium and an inextensible artery, the amplitude of the pressure oscillations resulting from the filling and emptying of the artery must *increase* as the compressing pres-