steel cylinders referred to on p. 381 are quite accurately tuned by Koenig by a special method. In general, it may be said that one of the most expensive ways of getting pieces of apparatus is to have them constructed by 'any carpenter;' *e.g.*, the time required to explain the construction of the Wheatstone stereoscope to an ordinary carpenter, the inevitable use of unseasoned wood, and the high wages demanded by the American workman, make the result ruinously expensive. Successful apparatus can be furnished at reasonable terms only by a conscientious workman under the supervision of the scientist. Can we not hope that Clark University will again add to its reputation by establishing a special mechanic who can make the material for this course under Professor Sanford's personal supervision? This will aid in the introduction of elementary laboratory work throughout American institutions.

In conclusion, it would be hard to overestimate the labor, care and skill that show themselves in every line of Professor Sanford's book; as an elementary laboratory course it is not only a pioneer—it is at the same time a brilliant success. It is to be hoped that this Part I. will be followed by a Part II., which shall serve as a second-year course of a quantitative character; the subject of Time—which has been, I believe, promised for this part—lends itself readily and elegantly to this method of treatment.

As an episode in the history of science this book marks the introduction into psychological work of the elementary qualitative laboratory method which has, for example, been so successful in chemistry; it also bears some resemblance to elementary courses in physics given in some high, normal and grammar schools. It is, of course, not intended that such laboratory work should form the whole of the psychological instruction; a more general treatise would probably be read at the same time, such as Ladd's *Outlines of Descriptive Psychology*, or Titchener's *Primer of Psychology*, or, possibly, my own *New Psychology*, with the omission of the couple of difficult chapters on statistics and color. This elementary qualitative work should be followed by most carefully planned exercises in elementary psychological measurements; at Yale such a set of thirty exercises has been designed to teach such elementary concepts and methods as 'average,' probable error,' 'function,' 'plotting,' determination of constant errors, compensation of progressive errors, in addition to the usual psychological concepts and observations in touch, hearing, sight, time, etc. This course, in turn, should be followed by advanced work in psychological measurements analogous to that in astronomy, geodesy, etc.; such a course includes a discussion of probabilities, statistics, least squares, etc., and their application to psychological work. With the completion of Professor Sanford's book and the appearance of more advanced laboratory manuals we may hope to find the methods of instruction as well systematized in psychology as in physics or chemistry.

E. W. SCRIPTURE.

SCIENTIFIC JOURNALS.

The Journal of Geology for April–May, 1898 (Vol. VI., No. 3), contains the following papers: 'Chemical and Mineral Relationships in Igneous Rocks,' by Joseph P. Iddings. Professor Iddings continues the interesting discussion of the chemistry of igneous rocks by means of plotted curves, which was begun in a previous number. He first establishes the formulas and molecular ratios of the chief rock-making minerals. Next from a series of diagrams which are plotted by using silica-percentages as abscissas and the ratio of the molecular ratios of alkalies to silica as ordinates for a great number of rock analyses, illustrations and curves of extreme mineralogical composition are drawn. They serve very neatly to localize and group within limits many rock analyses of more complex relationships and cast much light on the minerals that must result in the crystallization of maqueas whose composition is known. 'The Weathered Zone (Yarmouth) between the Illinoian and Kansan Till Sheets,' by Frank Leverett. This weathered zone is most pronounced and best recognized in the region between Davenport, Iowa, and Quincy, Ill. Its character is illustrated by various well-sections. 'The Peorian Soil and the Weathered Zone (Toronto Formation),' by Frank Leverett. A bed of muck and weathered soil, for which the

name 'Peorian' is suggested, lies between the Iowan and the Wisconsin till sheets. It is provisionally correlated with the earlier named Toronto beds of peat, etc. 'A Geological Section Across Southern Indiana, from Hanover to Vincennes,' by John F. Newsome. A very excellent geological section has been prepared and plotted, but in the illustration the scale is so reduced that the sections are practically illegible. One can only make them out with a magnifying glass. The letter-press describes the formations and their relations to the topography. 'Notes on the Ohio Valley in Southern Indiana,' by Arthur C. Veatch. The paper discusses the phenomena of the development of the present drainage in Spencer County, Ind., along the Ohio, and incidentally throws light on the relations of the continent to the sea during the formation of the Lafayette beds. 'The Brown or Yellow Loam of North Mississippi and its relation to the Northern Drift,' by T. O. Mabry. After defining the loam the author discusses its strategraphic relations to the underlying Lafayette and the Loess or Bluff formation, which is regarded as an equivalent. The origin and age ef the Loess-Loam concludes the paper. It is regarded as a flood-plain deposit of glacial débris, more or less worked over by the wind. 'Classification of the Mississippian Series,' by Stuart Weller. The paper is a valuable review of the subdivisions proposed for the Mississippian and indicates the portion of the continent over which each prevailed.

The *Physical Review* for June, the last number of the sixth volume, publishes as frontispiece a portrait of the late Professor William A. Rogers, of Colby University. It also contains an obituary notice of Professor Rogers and a bibliography of his contributions to science, including 61 titles. Other articles in the number are: 'On the Surface Tension of Liquids under the Influence of Electrostatic Induction,' Samuel J. Barnett; 'On the Fall of Potential at the Surface of a Metal when exposed to the Discharging Action of the X-Rays,' Clement D. Child; 'An Experimental Determination of the Period of Electrical Oscillations,' Arthur Gordon Webster.

Terrestrial Magnetism for June, 1898. The first article, by Professors Elster and Geitel, describes a method for determining the upward or downward direction of vertical electric currents in the atmosphere by means of atmospheric electric observations. These observations serve as a control upon the results obtained from magnetic observations made at the same time. Professor Abbe continues his article on 'The Altitude of the Aurora above the Earth's Surface.' The present installment gives a chronological summary of the results obtained up to date since Dalton's time. Mr. Putnam gives an interesting summary of Professor Eschenhagen's investigations of the magnetic anomalies in the Harz Mountains. Relations with reference to geological structure and with regard to deviations of the plumbline are discussed and cartographically exhibited.

In the next article Professor Eschenhagen discusses the electric car disturbances felt by magnetic observatories. The Potsdam Magnetic Observatory insists that no electric railways using the earth as a return circuit be allowed within a radius of fifteen kilometers.

Letters to the Editor and reviews conclude the number.

SOCIETIES AND ACADEMIES.

CHEMICAL SOCIETY OF WASHINGTON.

The 103d regular meeting of the Society was held on May 12, 1898.

The first paper of the evening was presented by Messrs. F. K. Cameron and H. A. Holly, and was entitled 'Acetone-Chloroform, 1st paper.' Acetone-chloroform is produced by bringing together acetone and chloroform and adding powdered potassium hydroxid to the cooled mixture in small portions at a time, allowing to stand until the reaction is completed and fractionating the fluid products. The experiments which are described by the authors have led them to the following conclusions:

I. The existence of but one acetone-chloroform, a white, crystalline solid, a derivative of tri-methyl-carbinol.

II. The substance is not a simple addition product and cannot be resolved into its original constituents by direct means.

III. The substance forms no definite hydrate.

IV. The temperature of the quadruple point