

has been divided by the Geological Survey for the purpose of hydrographical research, and that it is equally excellent in compilation and treatment.

The two papers on well waters contain much useful information on the means of finding and securing for domestic consumption a satisfactory supply of water from underground sources. The pamphlet on well-drilling is especially practical in its description of the outfit and appliances required for the purpose, and of the methods to be followed according to the exigencies of particular localities, exigencies which, it is to be observed, are frequently of an exceptional nature. The literature on the subject of well-sinking is by no means extensive, and Mr. Bowman has exploited a field of his own, comprising those features of American practice which are associated with pioneer work in districts where many of the ordinary resources of highly developed communities are not readily available. The scope of the manual is not limited to water wells—all classes of borings for oil, gas, and water are treated, though naturally the hydraulic aspect of the subject is that which receives most prominent consideration. The interaction of borings undertaken for different ends is noted, and the flooding of oil wells by carelessly constructed and abandoned water shafts is made the subject of very necessary advice and caution. The text is freely, yet judiciously, illustrated by diagrams and photographs; and though one of the former, otherwise complete, rather amusingly indicates a platform carrying a couple of men in mid-air without any visible means of support, yet where misconception is unlikely it would be ungracious to cavil at so slight a defect. The manual is one deserving of cordial commendation.

MAGNETIC OBSERVATIONS.

THE magnetic observations made during 1910 at the Khedivial Observatory, Helwan, are included in a small pamphlet of seven pages, which gives for each month and the year the mean values of the magnetic elements, the diurnal variations in declination, horizontal force and vertical force, and particulars of the ranges of these elements on the eight most disturbed days of the year. In the diurnal variation tables values are given for both midnights, the aperiodic element not being eliminated. This is rather unusual. These tables go to $0.1'$ in declination and to 1.7 (1×10^{-5} C.G.S.) in the force components. As the days tabulated in the month average twenty-eight, the expediency of going to $0.01'$ and to 0.17 seems worthy of consideration, especially as the diurnal ranges are small. Disturbances at Helwan, at least in 1910, seem to rule small. The largest ranges in the selected disturbed days were only $13'$ in declination, 187γ in horizontal force, and 58γ in vertical force. So far as internal evidence enables one to judge, its magnetic work does increasing credit to the Egyptian Survey Department, and it is to be hoped that it will continue to be prosecuted under favourable conditions.

In Blatt 3 of the Royal Observatory of Wilhelmshaven the assistant director, Prof. Bidlingmaier, continues the discussion of the magnetic disturbance character of the year 1910, initiated in Blatt 1 and 2, already noticed (March 16, p. 90). His method, it will be remembered, extends to individual hours the international scheme which assigns a magnetic character to individual days. Dr. Bidlingmaier's original view seems to have been that the disturbance character of a magnetic element might be based on the extent of its departure at the hour concerned from the corresponding mean monthly value on quiet days. He now regards this view as unsatisfactory, owing to its disregarding the influence of previous disturbance and making no allowance for Chree's discovery that the regular diurnal inequality varies according to the magnetic character of the day. His present estimate of hourly disturbance character seems based on the size of the maximum departure of the element during the hour from its mean value for the hour. He arrives at a numerical estimate of what he terms "Erdmagnetische Aktivität" for the months of 1910, and compares it with Wolfer's sun-spot frequency. The hourly character of the first six months of 1911 is shown graphically in the manner applied in Blatt 1 and 2 to 1910.

The results of observations made at the U.S. Coast

and Geodetic Survey's magnetic observatories at Cheltenham (Maryland), Sitka (Alaska), and Honolulu during 1907 and 1908 are published in volumes similar to those of previous biennial periods. Besides hourly readings and diurnal inequalities for the two years in question, the Cheltenham volume gives particulars of the mean annual values of the elements since the observatory began operations in 1901. A list is given of the fifty-eight principal magnetic disturbances of 1907 and 1908, with the times of their beginning and ending, and the curves obtained on nineteen of these occasions are reproduced, the times shown being G.M.T. The time scale adopted, 15 mm. to the hour, is more open than in previous years. The largest storms of the period were those of September 11 and 28, 1908. A list of earthquakes recorded by a Bosch-Omori seismograph is also given. The Sitka volume contains the usual tables of hourly readings and diurnal inequalities, and mean monthly values for the two years. A list is given of the sixty-two principal magnetic storms of the period, and the curves for sixteen of these are reproduced on a scale of 15 mm. to the hour. Sitka is a highly disturbed station, and during the principal storms there is at times considerable loss of trace; also the traces from the several elements being on one sheet—the usual practice with Eschenhagen magnetographs—there is a good deal of intercrossing of the traces. During the early part of 1908 there was also some loss of trace owing to defects in the driving clock, and a new one had to be substituted. Particulars are also given of the earthquake records obtained with a Bosch-Omori seismograph. Besides the ordinary tables of hourly readings, diurnal inequalities, &c., the Honolulu volume contains a list of the principal magnetic storms of the two years, and reproduces the curves for a number of these. Honolulu is a relatively quiet station, and loss of trace seems rare. The volume also contains a register of earthquakes recorded by a Milne seismograph.

UNIVERSITY AND EDUCATIONAL INTELLIGENCE.

THE death is announced of Prof. J. P. Schweitzer, professor of chemistry in the University of Missouri from 1872 until 1910, when he became professor emeritus. Prof. Schweitzer was born in Berlin in 1840, and went to the United States in 1865. He was known for his work in analytical and agricultural chemistry.

MR. F. PULLINGER, chief inspector of the Technological Branch of the Board of Education; Mr. W. R. Davies, assistant secretary of the Technological Branch of the Board of Education; Prof. John Perry, F.R.S., professor of mechanics and mathematics in the Imperial College of Science and Technology; and Mr. W. Gannon, principal of the Woolwich Polytechnic, have been appointed members, for a period of three years, of the Examinations Board of its Department of Technology by the City and Guilds of London Institute. They succeed Mr. C. A. Buckmaster, Prof. W. Gowland, F.R.S., Mr. J. H. Reynolds, and Prof. W. Ripper, whose terms of office have expired.

It is announced in *The Pioneer Mail* of August 4 that Rao Saheb Vasanti Trikamji has generously placed at the disposal of the Governor of Bombay a sum of two and a quarter lakhs of rupees for the foundation of a scientific library in connection with the institute of science now being erected in Bombay. The conditions attached to this donation are that the science institute library shall be called Vasanti Trikamji Mulji Library. A marble bust of Vasanti Trikamji Mulji and two marble tablets mentioning the amount of the donation and other particulars are to be placed in suitable positions. The Governor has publicly thanked Rao Saheb Vasanti Trikamji for his benefaction, which will enable provision to be made for the formation of an adequate scientific library in Bombay in connection with the institute of science.

WITH the adoption of the Budget for 1909-10, a system of automatic increases in salaries was inaugurated at the University of California. We learn from *Science* that an instructor's salary is to be increased automatically 20¢ per year from 200¢. to 300¢., and the salaries of assistant professors 20¢. a year from 320¢. up to 400¢. The automatic