

those whose means and leisure permitted, was that of pupilage. Now it is quite recognised that an alternative method of commencing training is afforded by well equipped Technical Colleges. In conclusion, Sir William White referred to the steps which have been taken in the organisation of educational work in Bristol, and to prevent over-lapping of the various institutions and authorities concerned with education. Prof. Wertheimer, the headmaster, reports that, acting on the suggestions of the Technical Instruction Committee of the Bristol Town Council, the Governors of the Technical College have completed an agreement with the Bristol School Board, in virtue of which the evening class work of the Board and of this College, in science and technology, are so arranged as to avoid overlapping. In virtue of an agreement with the Bristol School of Art, the Art School of the College will be closed at the end of this session, and art students will be advised to attend the other school; the School of Art on its side will close its science classes and advise its students of science to attend the College. The relation of the Technical College to the University College does not appear to be mentioned in the report.

SCIENTIFIC SERIALS.

American Journal of Science, February.—Sedimentary rocks of Southern Patagonia, by J. B. Hatcher. Two years of further study have greatly augmented the results obtained since the first report. Chief among the additional observations and resultant modifications of the author's former views are:—(1) The discovery near Sandy Point, in the Strait of Magellan, of an entirely new series of Tertiary deposits several hundred feet thick, and underlying the Patagonian Beds. These new Tertiary deposits have already been noticed by Dr. A. E. Ortmann, and have been named by him the Magellanian Beds. (2) The discovery near Lake Pueyrredon of several distinct fossil-bearing horizons in the Cretaceous.—Explorations of the *Albatross* in the Pacific (II.), by Alexander Agassiz. The choice of Dolphin Bank, Tahiti, as a standard to determine the growth of coral turns out to have been unfortunate, as it is in the midst of an area comparatively free from corals. Only a few growing corals were found by the author, the top of the bank being entirely covered by Nullipores. After coaling at Tahiti, the *Albatross* left for a cruise in the Paumotu. The western islands are probably all on a great plateau connected perhaps by the 800-fathom line. The soundings, like those off the Fijis, show that atolls do not necessarily rise from great depths, and that in this characteristic atoll district atolls are found, it is true, with steep slopes, but rising from moderate depths.—Action of ammonium chloride upon analcite and leucite, by F. W. Clarke and G. Steiger. When analcite is heated with four times its weight of ammonium chloride, about one-half of the soda in the analcite is converted into chloride, while variable ammonia is retained. Other zeolites, like leucite, natrolite, laumontite, stilbite, chabazite, apophyllite, show a similar reaction, varying, however, to an extent which probably depends upon their molecular structure. A new means of studying the latter is thus provided.—Devonian strata in Colorado, by A. C. Spencer. Devonian and associated strata were deposited originally over an extensive area in the southern Rocky Mountain region, the boundaries of which are as yet entirely unknown.—Estimation of thallium as the acid and neutral sulphate, by P. E. Browning. The salt obtained by heating thallos chloride with sulphuric acid until the excess of the latter is expelled, and then raising the heat to redness, has the constitution of a neutral sulphate. The author tested whether this neutral sulphate, or the acid sulphate described by thallium, can be used for the estimation of thallium, and finds that it can be done, provided the conditions of temperature are carefully attended to.—Motion of a submerged index-thread of mercury in the lapse of time, by C. Barus. The author endeavoured to frame a theory to account for the observed gradual sinking of an index-thread of mercury in a vertical tube containing water. He proceeded on the supposition that water penetrates past the index-thread in a very thin sheet, but found that the thickness of the sheet would have to be far below that of a molecule of water. He eventually found that the sinking was due to the volume viscosity of glass. A four years' experiment showed that the sinking proceeds at a regularly retarded rate through infinite time.

Annalen der Physik (formerly *Wiedemann's Annalen*), No. 1.—A study on soap-bubbles, by O. Dörge. The author performs

on a soap-bubble a cyclical electric process analogous to a Carnot cycle, the expansion and contraction being either at constant charge or at constant potential. He arrives at a law which states that no process is possible in which electric energy is transferred without loss or gain from one potential to another. This law corresponds to the second law of thermodynamics.—Diffuse reflection of light, by H. Wright. If the angle of incidence is constant, the intensity of reflected light varies as the cosine of the angle of reflection in the case of perfectly dull surfaces. The converse does not hold good, so that Lambert's law is only partially correct.—Electric conductivity of dilute amalgams, by A. Larsen. Experiments upon amalgams of lead, zinc, cadmium, tin and bismuth show that the metal contained in dilute liquid amalgams is dissociated, and that the degree of dissociation increases with the dilution and the temperature.—Stationary temperature of an electrically heated conductor, by F. Kohlrusch. The author supposes a conductor whose surface is protected from loss of heat, except two terminals, each of which is kept at a constant temperature and a constant potential. When the stationary state has been attained, all points at the same potential will also have the same temperature. The greatest quantity of heat will be developed in those metals in which the ratio of the thermal to the electrical conductivity is smallest.—Spark potential in gases, by A. Orgler. The author proposes a new definition of the "specific electric strength" of a gas, which gives a real constant for any given gas. If δ is the width of the gap, and A and B the spark potentials in the gas and in air respectively, the specific electric strength is the ratio $\frac{dA}{d\delta} : \frac{dB}{d\delta}$. It is unity for air, 0.888 for carbonic acid, and 0.563 for hydrogen, whatever the width of the gap.—Molecular susceptibility of paramagnetic salts of the iron group, by O. Liebknecht and A. P. Wills. Jäger and Meyer's series of atomic susceptibilities of Mn, Fe²⁺, Co, and Ni, in the ratio of 6 : 5 : 4 : 2, is not confirmed, the numbers obtained being 6.98 : 5.86 : 4.70 : 2. Wiedemann's series $a, a+b, a+\frac{1}{2}b, a+2b$ agrees rather better with facts, but a still closer approximation is obtained by putting $b=1.25a$ instead of $1.15a$. There is a sudden rise from chromium to manganese and ferric iron, and a gradual fall from the latter to cobalt, nickel and copper.—Molecular susceptibilities of salts of the rare earths, by H. du Bois and O. Liebknecht. There is a gradual rise from cerium to praseodymium and neodymium; a decided rise in samarium, gadolinium and erbium, and a sudden fall to ytterbium.—Magnetic viscosity, by Lizzie R. Laird. To preserve the initial or instantaneous magnetisation of a disc for measurement, it is kept in rotation, and the rise of intensity of magnetisation on stoppage is recorded by a photographic device.

THE number of the *Journal of the Royal Microscopical Society* for February 1900 contains a further instalment of Mr. F. W. Millett's Report on the recent Foraminifera of the Malay Archipelago, collected by Mr. A. Durand; and a paper by Dr. H. C. Sorby, F.R.S., on the Preparation of Marine Worms as Microscopical Objects, the fluid used for removing the salt being a strong solution of glycerin. The character and arrangement of the blood-vessels are especially well brought out by this mode of treatment. Among the paragraphs relating to Microscopy may be especially mentioned an abstract of van Heurck's paper, from the *Annales de la Société Belge de Microscopie*, on Modern Apochromatic Objectives.

SOCIETIES AND ACADEMIES.

LONDON.

Royal Society, January 18.—"An Experimental Investigation of the Thermodynamical Properties of Superheated Steam." By John H. Grindley, B.Sc., Wh.Sc. Communicated by Prof. Osborne Reynolds, F.R.S.

In Regnault's experiments on the relations between the pressure, temperature, and latent heats of saturated steam, the steam to be experimented upon was obtained by withdrawing it upwards from a boiler, allowing any entrained moisture to be separated by gravity. Saturated steam obtained in any other manner would not necessarily have the same total heat of evaporation as that obtained by Regnault.

Whether the steam could always be brought into the same condition, as regards its freedom from moisture, by such a process of drainage was open to question, and it remained to be deter-