THE Calendar of the University College, Bristol, for the session 1893-94 has just been issued through Mr. Arrowsmith, of Bristol.

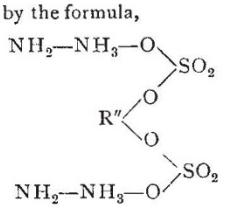
PROF. KINCH, of the Royal Agricultural College, Cirencester, has just issued a report of some of his field experiments for 1892 and 1893.

MR. W. F. STANLEY, of Great Turnstile, Holborn, has sent us the new edition of his catalogue of mathematical instruments made and sold by him. It is excellently printed upon good paper, and is very admirably classified.

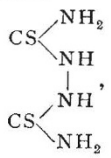
THE U.S. Department of Agriculture, division of Entomology, has lately brought out Vol. v., No. 5, of "Insect Life."

WE are informed by a correspondent that the Rev. L. Blomefield, whose death we recorded in last week's NATURE, was in his ninety-fourth year, and not, as stated by us, in his ninety-first.

FURTHER information concerning hydrazine, N_2H_4, and its compounds is contained in an inaugural dissertation by one of Prof. Curtius's assistants at Kiel, Herr Franz Schrader, and a brief account of it will be found in the current *Chemiker Zeitung*. A considerable time has now elapsed since the first preparation of hydrazine, which was announced by Prof. Curtius in June, 1887, and it is almost three years since full details were published concerning the isolation of the pure hydrate, a liquid of the composition $N_2H_4.H_2O$ which boils at 119°. It was then stated (vide NATURE, vol. 43, p. 205) that in closed vessels this hydrate may be preserved unaltered for any length of time. The experience of the last three years, however, necessitates a modification of that statement, and Herr Schrader now informs us that the liquid stored in sealed tubes decomposes sooner or later, the principal product of decomposition being ammonium hydrate. No gas appears to be generated during the process, so that tubes containing it do not become dangerous from accumulation of pressure. The reactions between the hydrate and a large number of metallic oxides are described, in which the strong reducing proclivities of hydrazine are very markedly exhibited, the reaction being frequently of an explosive character. Herr Schrader further describes a series of double sulphates containing hydrazine sulphate and the sulphate of a metal. Their general formula is $R''SO_4.(N_2H_4)_2H_2SO_4$ where R'' may represent copper, nickel, cobalt, iron, manganese, zinc and cadmium. These double sulphates, which contain no water of crystallisation, and are further distinguished from the double sulphates containing ammonium by their difficult solubility, are readily prepared by the admixture of solutions of the constituent simple sulphates. The constitution of the salts is probably expressed by the formula,



Considerable difficulty was found in preparing double chlorides of fixed composition containing hydrazine-chloride. Good crystals of very soluble double chlorides are easily obtained, but so many appear capable of existence that the conditions for the formation of salts of definite constitution have not yet been ascertained. Two entirely new compounds of hydrazine are described by Herr Schrader. By saturating hydrazine hydrate with sulphocyanic acid, or by decomposing hydrazine sulphate with barium sulphocyanate, hydrazine sulphocyanate, $N_2H_4.HSCN$, is obtained as a deliquescent solid substance which melts at 80°. When this hydrazine sulpho cyanate is heated, or when molecular proportions of hydrazine dichloride $N_2H_4.2HCl$ and ammoniumsulpho cyanate in aqueous solution are heated for four or five hours in a sealed tube to 100°, a second new substance of urea-like constitution



is formed. This second substance, hydrazine sulphocarbamide crystallises well from solution in hot water and melts at 214-215°. Its properties are somewhat remarkable, inasmuch as it appears to possess fairly strong acid properties, its solution yielding very characteristic precipitates with solutions of most metallic salts. The dissertation of Herr Schrader likewise reviews most of the work which has been carried out in the Kiel laboratories in connection with hydrazine, and adds many little details of importance in the practical manipulation of the substance and its compounds.

NOTES from the Marine Biological Station, Plymouth.—Last week's captures include the Actinian *Zoanthus Couchii* and the Archiannelid *Histriobdella Homari*. In the floating fauna *Noctiluca*, *Obelia* medusæ, Cirrhipede *Nauplii* and Caridid larvæ were plentiful; *Sagitta*, *Oikopleura* and the tubicolous larvæ of *Terebella* were fairly numerous. Specimens were also taken of the Leptomedusæ *Willia stellata* and *Eucopium quadratum*, of young stages of *Geryonia*, of *Doliolum Tritonis* and Ascidian larvæ, and of the larvæ of the Gephyrean *Thalassema*. The Nemertine *Amphiporus pulcher* and the Mollusc *Goniodoris castanea* are now breeding.

THE additions to the Zoological Society's Gardens during the past week include a Sooty Mangabey (*Cercocebus fuliginosus*, ♀) from West Africa, presented by Miss Grimston; two Brazilian Cariamas (*Cariama cristata*) from Brazil, presented by Mr. Lindsay C. Scott; a Melodious Jay Thrush (*Leucodioptron canorum*) from China, presented by Mr. B. H. Jones, F.Z.S.; a Wall Lizard (*Lacerta muralis* var. *taliguerta*) from Triest, presented by Mr. A. W. Arrowsmith; a Chilian Teal (*Querquedula creccoides*) from Antarctic America, a Little Tern (*Sterna hirundo*) from Brit. Isles, an Axis Deer (*Cervus axis*, ♂) from India, and a St. Thomas's Conure (*Conurus pertinax*) from West Indies, purchased.

OUR ASTRONOMICAL COLUMN.

MR. TEBBUTT'S OBSERVATORY.—We have received from Mr. Tebbutt the report of the work that has been done during the year 1892 at his observatory. In addition to meridian observations a great many extra-meridian observations were made, among which we may name the following:—Forty-five phases of occultations of stars by the moon, several observations of the phenomena of Jupiter's satellites, twenty good comparisons of the planet Mars, when in conjunction with Iota Aquarii, with that star, by means of the filar micrometer on the 8-inch equatorial, numerous observations of the comets visible in that year, about fifteen double-star measures and the variable star observations, including a few comparisons of η Argus and R. Carinæ with neighbouring stars. The meteorological observations have been regularly taken. Under the heading "Personal Establishment," an idea of the energy and zeal which Mr. Tebbutt shows for this science can be gathered from the fact that all the astronomical, and nearly all the meteorological observations are made by himself. Occasionally his son takes the meteorological readings during his absence from home, while the assistance of a computer is sometimes made use of. Although Mr. Tebbutt has received from several as-

tronomers many suggestions as to work desirable to be done, he, nevertheless, wishes to fulfil the main work of the observatory, which consists in observations of lunar occultations of stars, southern comets, and the meteorological observations. That Mr. Tebbutt is thinking about seeking some relaxation, is only natural when one considers how his powers must have been taxed during the last few years; and we sincerely hope that after a good holiday and rest he may come back to his work again a new man, and continue the work he has so ably begun.

UNIVERSAL TIME IN AUSTRALIA.—With three meridians differing by one hour from one another passing through the continent of Australia, the question has been raised as to whether only central time should be used, or all three times. (*The Observatory* for September). Adopting the latter, it will be necessary, of course, for frequent changes of time to be made; but with the former, although places on the extreme east and west would have their time about 1½ hours away from local time, greater convenience for railways, telegraph work, &c., will be gained. Sir Charles Todd, who supports this latter view, and who is backed by the Hon. J. G. Ward (New Zealand), the Hon. J. Kidd (N.S.W.), and the Hon. A. Wynne (Victoria), came to the following conclusion at the Postal and Telegraph Conference held in Brisbane this year, when the subject of the Hour Zone Time was being considered:—"That it is desirable in the public interests that the Hour Zone system should be adopted in a modified form, so that there should be one time throughout Australia, viz. that of the 135th meridian, or nine hours east of Greenwich."

SOCIETIES AND ACADEMIES.

PARIS.

Academy of Sciences, September 4.—M. Lœwy in the chair.—Report upon a memoir by M. Defforges, entitled, on the distribution of the intensity of gravity at the surface of the globe, by MM. Fizeau, Daubrée, Cornu, Bassot, Tisserand. This memoir, submitted to the judgment of the Academy by the Minister of War, summarises the theoretical and experimental researches made during eight years in the geographical service of the army, with the object of determining the absolute intensity of gravitation for a small number of primary stations, and the relative intensity for a large number of secondary stations with simplified apparatus. The latter were determined by means of the "reversible invertible pendulum" invented by M. Defforges, which exceeds all used previously in lightness and convenience, and easily gives an approximation to within 1 part in 100,000. The anomalies extending along a line from Spitzbergen through the Shetlands, Scotland, England, France, and Algiers considerably exceed any possible experimental errors, and the excess of gravitation on the islands and defect on the continents is well established. The report, which was adopted by the Academy, advises the Government to supply M. Defforges with the means to extend his work to the islands of the southern hemisphere and especially the Pacific.—The hypothesis of sub-continental bells, by M. Rateau. The phenomena of the earth's crust are well explained and connected by assuming that the crust underneath the continents does not touch the fluid globe, but is separated from it by a space filled with gaseous matter under pressure. The continents would thus form a sort of bells, very much flattened, and supported by gas, whereas the ocean beds would lie direct upon the igneous globe. The continental projections tend generally to rise, blown up as it were by the accumulating gas below, whilst the sea-beds sink. But the gases, imprisoned under high pressure, escape gradually through the fissures of the crust, when the production of new quantities from the nucleus will become insufficient, the pressure under the continents will decrease, and these will be projected upon the new crust underneath, giving rise to more or less extended crateriform configurations. This is the state in which we see the moon at the present time. If the earth's crust is assumed to be 30 km. thick, the pressure of the gases should be 650 atmospheres and their temperature 900°. The gases would be of a density nearly equal to that of water, and superposed in the order: hydrogen, methane, nitrogen, ethane, oxygen, carbonic anhydride. Hydrochloric acid and siliciuretted hydrogen would also probably be stable under these conditions. The presence of gas underneath the continents, elevated as they are above the sea and of greater density than water, is necessitated by conditions of hydrostatic equilibrium. It is easily seen why volcanoes in the interior of continents never give off larva, but only gases; also why lines of coast volcanoes have successively receded inland where the sea encroached.—On the elimination of foreign bodies in the *Acephala* and especially in *Pholas*, by M. Henri Coupin. If the mantle and the ventral siphon of a Pholas are cut along their entire length, and a collection of foreign particles are thrown upon the tentacles, the particles falling upon the dorsal tentacles are carried away with great rapidity, not towards the mouth, but upon that part of the mantle which lies between the anterior luminous organ and the palp. Thence they pass quickly towards the siphon region, and are stuck together by mucus and rolled up into balls, which are then extruded at the siphon. It is thus that the animal gets rid of the particles of rock disintegrated during its boring operations, and protects its delicate internal canals.

BOOKS, PAMPHLETS, and SERIALS RECEIVED.

BOOKS.—Index to the Publications of the Anthropological Institute (1843 to 1891): G. W. Bloxam (Anthropological Institute).—The Amphioxus and its Development: Dr. B. Hatschek, translated and edited by J. Tuckey (Sonnenschein).—The Pharmacopœia of the United States of America, 7th Decennial Revision, 1890 (Philadelphia).—London Inter. Science and Prelim. Sci. Directory, No. iv. July 1893 (London).—Accidents de Chaudières: F. Sinigaglia (Paris, Gauthier-Villars).—Théorie des Jeux de Hasard: H. Laurent (Paris, Gauthier-Villars).—Smithsonian Institution, 'Report of National Museum for Year ending June 30. 1891 (Washington).—An Elementary Text-book of Biology: J. R. A. Davis. 2nd edition, 2 parts (Griffin).—Publicazione della Specola Vaticana, fasc. iii. (Rome).—Bulletin of the U.S. Fish Commission, Vol. x. for 1890 (Washington).—Index Kewensis: Sir J. D. Hooker and B. D. Jackson. Part 1 (Oxford, Clarendon Press).—A Contribution to the Geology and Natural History of Nottinghamshire: edited by J. W. Carr (Nottingham, Bell).—Illustrated Hand-book of the Cape and South Africa: edited by J. Noble (Stanford).—Terra: A. A. Anderson, 2nd edition (Reeves and Turner).

PAMPHLETS.—Abstract of Returns furnished to the Department of Science and Art (Eyre and Spottiswoode).—Report of Mr. Tebbutt's Observatory, the Peninsula, Windsor, N.S.W. 1892: J. Tebbutt (Sydney).

SERIALS.—Journal of the Anthropological Institute, August (K. Paul).—Natural Science, September (Macmillan).—Geological Magazine, September (K. Paul).—American Journal of Mathematics, Vol. xv. No. 3 (Baltimore).—Journal of the Asiatic Society of Bengal, Vol. 62, Part 2, No. 1 (Calcutta).—Journal of the Chemical Society, September (Gurney and Jackson).—Proceedings of the American Philosophical Society, Vol. 31, No. 141 (Philadelphia).—Proceedings of the Rochester Academy of Science, Vol. 2, Brochure 2 (Rochester, New York).—Geological and Natural History Survey of Minnesota, Bulletin No. 8 (Minneapolis).—Medical Magazine, September (Southwood).—Proceedings of the Royal Society of Edinburgh, Session 1892-93, Vol. xx. pp. 1 to 96.—Journal of the College of Science, Imperial University, Japan, Vol. 6, Part 2 (Tokyo).

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