

effects due to the pitching of the vessel and the actual form of the bottom.

In several of the diagrams the rapid scending of the vessel was noticeable in oscillations to the extent of 2 or even 3 feet; but it was not difficult to draw a mean line which would eliminate the motion with a fair degree of accuracy. Practically the speed of the launch scarcely exceeded that at which she might have proceeded with two leadsmen sounding in the ordinary manner, and the same number of hands are required, although they need not necessarily be skilled leadsmen. Two officers are necessary for fixing the vessel, as they would be in ordinary circumstances.

On a rocky bottom, where dredging has been carried out, the weight would be constantly liable to catch in the inequalities of the bottom, and bring up the boat, thus causing delays and possibly breakage of gear. In such cases, moreover, the usual method of sweeping with an iron bar could not safely be dispensed with, however accurately each separate section might be obtained.

On the whole, it may be said that the advantages to be derived from the invention do not at present seem so clearly pronounced as to make it likely that it would be adopted for use under the conditions usually prevailing in the examination of dredged channels. There might, however, be special circumstances in which it could be used advantageously.

A. M. F.

#### NOTES.

A MONUMENT to Gregor Mendel, the naturalist, who was born at Amsterdam in 1822 and died at Brünn in 1884, was unveiled at the latter place on October 2.

THE summer season, comprised by the six months from April to September, can in no sense be considered ideal, although from a meteorological point of view it has not differed very widely from the average. At Greenwich the mean temperature for the six months was  $57.0^{\circ}$ , which is  $0.9^{\circ}$  below the average of the past sixty years, but is  $0.9^{\circ}$  higher than for the corresponding six months in 1909. The warmest month was August, with a mean temperature of  $62.2^{\circ}$ , and this was followed by a mean of  $61.5^{\circ}$  in June. May and June were the only two months with the mean temperature in excess of the average. The highest shade temperature during the summer was  $82.3^{\circ}$ , in June, and there was no other month with a temperature of  $80^{\circ}$ . The only years since 1841 with a slightly lower absolute maximum summer temperature are 1853, 1862, 1879, and 1882. There were in all only fifty-one days with a temperature of  $70^{\circ}$  or above, and the only summers with so few warm days are 1860, 1879, and 1888. The most conspicuous month for the absence of warm days was July, when there were only six days with a temperature of  $70^{\circ}$  or above; this is the smallest number of such warm days in July since the establishment of trustworthy records in 1841. August had twenty days with a temperature of  $70^{\circ}$  or above, and June follows with seventeen; in September there were only two. The only instances of frost in the shade in the six summer months are two in April and one in May. The aggregate rainfall at Greenwich was 13.60 inches, which is 1.22 inches more than the average of the past sixty years, but is 0.44 inch less than for the corresponding period in 1909. The rainfall was in excess of the average in each month, with the exception of September, when there was a deficiency of 1.47 inches. The wettest summer month was July, with a total measurement of 3.55 inches, which is 1.15 inches more than the normal. In all, rain

fell on ninety-two days, but only on three days in September, when the aggregate measurement was 0.72 inch, and on one day the fall was 0.66 inch. The duration of bright sunshine was 966 hours, which is 165 hours fewer than the average, and May is the only month with an excess of sunshine. The sunniest month was May, with a total duration of 219 hours, and the least sunny month was July, with 112 hours' duration, which is 124 hours fewer than the normal. The finest month of the six was undoubtedly September.

MR. MARCONI has informed the Marconi Wireless Telegraph Company that wireless telegraphic messages have been successfully transmitted between Clifden (Galway) and Buenos Aires, a distance of about six thousand miles, without the employment of an intervening relay station. We learn from a note in the *Engineer* for September 30 that the tramp steamer *Nonsuch*, whilst on her voyage from Bombay to Hull and Middlesbrough, was heard at the wireless station at the North Foreland calling her name when she was fifteen miles south of Cape de Gaa, at the south-east corner of Spain, a position distant 940 nautical miles from the North Foreland. This distance, across the obstacle of the whole of France and Spain, and the Pyrenees, is a remarkable range for wireless signals from a ship. The owners received a message through the station at Ushant, sent from the ship off Cape Roca, near Lisbon, no less than 610 nautical miles from Ushant. The *Nonsuch* is the first tramp steamer to be fitted with wireless telegraph.

THE council of the Institution of Civil Engineers has made the following awards in respect of papers published in Section ii. of the Proceedings for the session 1909-10:—A Telford gold medal to Major W. W. Harts, U.S. Army (Nashville, Tenn.); a Watt gold medal to Mr. A. S. Trewby (London); a Crampton prize to Prof. A. H. Gibson and Mr. A. Ryan (Manchester); and Telford premiums to Messrs. W. R. Baldwin-Wiseman (Southampton), O. W. Griffith (London), Dr. W. E. Lilley (Dublin), W. Corin (Sydney), J. A. Saner (Northwich), and F. O. Blackwell (New York). The council has awarded the Indian premium for 1910 to Mr. C. W. Lloyd-Jones (Secunderabad).

THE Paris correspondent of the *Times* has reported the death, in his sixty-ninth year, of Prof. Fulgence Raymond, clinical professor of diseases of the nervous system in the University of Paris, and superintendent of the Salpêtrière. Prof. Raymond became known first by a special study on "L'Hémichorée, L'Hémianesthésie, et Les Tremblements Symptomatiques." On the death of his friend and teacher Charcot, in 1894, Raymond was appointed to succeed to the chair of clinical professor of nervous diseases. He was the author of many works on nervous and kindred diseases, and was celebrated for the laboratories of pathological anatomy and physiological psychology which he instituted and superintended at the Salpêtrière. Prof. Raymond was a member of many of the scientific societies of Europe.

THE ordinary meetings of the Royal Geographical Society for the winter session will begin on November 7, when Major P. Molesworth Sykes will lecture on his further journeys in Persia. Subsequent meetings have been provisionally arranged as follows:—November 21: some results of the Duke of the Abruzzi's Karakoram expedition, Dr. Filippo de Filippi; December 5: the new geography and its aims, Mr. H. J. Mackinder, M.P.; December 19: the French Antarctic Expedition, 1909-10,



Dr. J. B. Charcot; January 16, 1911: the *Michael Sars* North Atlantic deep sea expedition, Sir John Murray and Dr. Hjort. A selection from the following papers may be expected during the session:—Recent explorations in Dutch New Guinea, Dr. H. A. Lorentz; the development of British Central Africa, Sir Alfred Sharpe; recent boundary work in Bolivia, Major P. H. Fawcett; the peoples of the Sudan, Dr. C. G. Seligmann; the geographical conditions affecting the development of Canada, Prof. W. L. Grant; economic geography of the Tyne, Mr. A. J. Sargent; distribution of cotton culture within the British Empire, Mr. J. Howard Reed; researches in the Himalayas, Dr. Arthur Neve; explorations in western and northern Australia, Mr. A. W. Canning.

MR. C. G. THORP, 182 St. George's Terrace, Perth, Western Australia, writes:—"I am endeavouring to prove the origin of obsidianites; it has been stated that Mr. Dunn's bubble hypothesis is impossible on account of the occurrence of dumb-bells. I wish to endeavour to make a dumb-bell by the union of the drops of two bubbles. Perhaps one of your readers would help me to the formation of a very viscid fluid that would dry." The inquiry was submitted to Prof. C. V. Boys, who has kindly sent the following reply:—"The best mixture for blowing bubbles that will solidify, not exactly dry, is resin containing one-tenth, more or less, of beeswax, melted and blown when fluid. Possibly the addition of Canada balsam would make the mixture more adhesive. No soap and glycerine mixture will make a bubble that will dry."

In a letter entitled "An Undescribed Feather-element," which appeared in *NATURE* of September 15, Mr. F. J. Stubbs described a remarkable feature of the structure of the primary feathers of certain birds, which he said "seems to be hitherto undescribed." Two correspondents have written to point out that the peculiarity in question has been described before. Mr. W. P. Pycraft states that he published an account of the structure seventeen years ago in the pages of *Natural Science* (vol. iii., 1893, p. 197). Prof. R. v. Lendenfeld, of Prague, informs us that "these structures have been studied in my laboratory and carefully described and figured by one of my students, Dr. E. Mascha, in his paper 'Ueber die Schwungfedern' (*Zeitschrift für wissenschaftliche Zoologie*, vol. lxxvii., 1904, pp. 606-51, nine text figures, Plates 29-31), on p. 614 ff, an English version of which appeared in the *Smithsonian Miscellaneous Collections* (vol. xlviii., 1905, 30 pp., 15 plates) under the title 'The Structure of Wing Feathers.'"

In *Man* for September Mr. W. E. Hardenburg, in an account of the Indian tribes of the Putumayo River, one of the principal tributaries of the Upper Amazon, describes what he terms a system of "wireless telegraphy" in use among this race. It consists of two logs of hard wood pierced by narrow holes of longitudinal section, burnt out by heated stones. One log is always thicker than the other, producing two grave notes, while the smaller trunk gives out two which are acute. They are hung from the roof timbers, and are beaten with a club tipped with rubber. A code is arranged based upon the differences of tone and the length and number of the blows, so that messages can be exchanged, on a clear day the sound reaching a distance of from 12 to 15 kilometres.

A SERIES of experiments by Messrs. R. M. Yerkes and D. Bloomfield is described in the *Psychological Bulletin* for August, planned to answer the question, Do kittens kill mice instinctively? The experiments decide in the

affirmative. They show that "the instinct to kill may manifest itself in the kitten before the end of the first month of life, while the animal is yet feeble and barely able to eat a young mouse." The instinctive reaction, though somewhat variable with individual kittens, is fairly definite in character. It appears quite suddenly, and is aroused by the movement of the mouse, and, after the first reaction, by the smell of the mouse. Usually it develops during the second month of the kitten's life, and does not completely wane during the following two or three months, but "it apparently becomes increasingly difficult to evoke. The practical inference is: allow a kitten to exercise its killing instinct when young if a good mouser is desired." The authors admit the great value of imitation and experience for the killing reactions of kittens, and for the modification and development of these reactions. But the prime object of their experiments is to show that kittens, reared in solitude, seize the mouse, even in the first kill, so that they cannot be bitten by it, and that the visual experience of movement is the primary condition for the initiation of the instinct.

In the *Bulletin of the Johns Hopkins Hospital* for September Dr. C. L. Minor, of Asheville, N.C., has a paper on the use of the X-ray in the diagnosis of pulmonary tuberculosis. This subject was discussed at the recent annual meeting of the British Medical Association in London (see *NATURE*, August 4). Dr. Minor gives full directions as to the most suitable arrangement of the apparatus and of the dark-room, and as to the positions in which patients should be examined. His paper is chiefly interesting as representing the point of view of a physician in general practice in contrast to that of the X-ray specialist. In his opinion the general practitioner should confine himself to the use of the fluorescent screen, and leave the taking and the interpretation of photographic plates, with the great amount of detail they contain, to the X-ray specialist. He enters fully into the controversy regarding the comparative value of the clinical and the radioscopic methods of diagnosis of phthisis in its earliest stages. Many X-ray specialists, he says, insist that signs of early phthisis are shown by the Röntgen rays before the physician is able to demonstrate them by the ordinary methods of physical diagnosis. In Dr. Minor's opinion this is due to the fact that many clinical physicians are not really expert in the method of physical diagnosis, and that they frequently overlook signs which a more trustworthy diagnostician would have discovered. Dr. Minor's own experience goes to show that there are few cases in which, although distinct shadows are shown by the X-rays, no physical signs can be elicited in the chest. The present writer, however, has frequently had patients sent for examination by thoroughly competent physicians with the statement that no physical signs of lung disease were present. He has then demonstrated to the physician the exact position and extent of the pulmonary lesion, and the physician has thereupon been able, by a careful examination, to detect definite signs at this spot. Dr. Minor directs special attention to the frequency of the discovery of enlarged lymphatic glands in the chest, and he describes the positions in which they are to be found. His conclusions lend further confirmation to the view, now generally accepted as true, that the X-ray examination of the lungs is a very valuable aid to the early diagnosis of pulmonary phthisis.

DR. P. L. SCLATER has contributed to the "Handbook of Jamaica for 1910" a revised list of the birds of Jamaica, based on the one by Messrs. A. and E. Newton



in the same publication for 1881. The new list, which is printed separately in pamphlet form, and can be obtained in London of Messrs. H. Sotheran and Co., contains notes on the distribution of the various groups.

THE European hedgehog has been hitherto considered to differ from other species of its genus in the peculiar form and single root of the third upper incisor and upper canine, while it has also been supposed to be characterised by the constant presence and relatively large size of the second upper premolar. From an examination of a large number of specimens, Mr. E. Hollis (*Zoologist* for September) finds, however, that two of these characters are by no means constant. Thus, out of eleven British examples, in only one case was the upper canine single-rooted, while in six instances it was double-rooted, and in the remaining four in a kind of intermediate condition. In the same series the second upper premolar was absent in three instances, rudimentary in one case, and normal in the remainder. From this it is inferred that *Erinaceus europaeus* is in a state of unstable equilibrium in regard to the latter tooth, thereby resembling the Asiatic *E. micropus* and *E. pictus*. Somewhat similar variations were observed in the collection of skulls of the European species in the British Museum, but in no instance was the third upper incisor observed to be double-rooted. A single root to this incisor may therefore still be characteristic of *E. europaeus*.

THE fourth part of the Flora of Glamorgan, dealing with the division Incompleteæ of the Dicotyledons, has been recently published. The flora is being prepared under the editorship of Prof. A. H. Trow by a committee, for whom Dr. and Miss Vachell act as secretaries. It is noted that several critical and polymorphic species require more detailed observation and study.

A SECOND report on the Hymeniales of Connecticut, constituting Bulletin No. 15 of the State of Connecticut Geological and Natural History Survey, requires to be taken in conjunction with the preliminary report published as Bulletin No. 3, in which the keys to the genera were given. Analytical keys for the species are supplied in the present bulletin, and are accompanied by excellent illustrations of selected types. Prof. A. E. White, who is responsible for both reports, also provides a good account of some edible species of Agaricaceæ; most of the species are similar to those recommended by British fungologists, but the author is bolder than some authorities in recommending *Lactarius piperatus* and *Cantharellus aurantiacus*.

THE plant formations of East Bolivia, which were briefly outlined and illustrated by Dr. Th. Herzog in a number of the *Vegetationsbilder*, are described at greater length in Engler's *Botanische Jahrbücher* (vol. xlv., part iii.). A well-defined formation is that of the Pantanales, developed near Carumba, in the extreme south-east, which is a fertile virgin forest, consisting largely of deciduous trees with a wealth of lianes. *Piptadenia macrocarpa* is a dominant tree, valued for its timber and astringent bark; *Tecoma Ipe* is another magnificent tree, yielding a durable timber, and *Calceophyllum multiflorum* is also characteristic of the formation. The lianes include *Urvillea laevis*, *Bignonia unguis cati*, and species of *Serjania*. The author presents a graphic description of the magnificent palm, *Orbignya phalerata*, *Physocalymma scaberrima* (Lythraceæ), and various species of *Tecoma*, that inhabit the highlands of Velasco, and extols the beauty of the flowering shrubs found on the Cordilleras.

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DR. FELIX OSWALD, so well known for his geological map and description of Armenia, has published an account of the tectonic development of the Armenian highlands in *Petermann's Mitteilungen* for 1910 (pp. 8, 70, and 126). The movements that affected the pre-Devonian rocks are obscured by the potency of the Hercynian and Alpine movements. The Alpine uplift was foreshadowed in Armenia by considerable folding in Upper Eocene times, but the resulting land-surface was reduced almost to a peneplain before the great transgression of the Miocene sea. This sea even spread over land that had remained unsubmerged since the opening of the Mesozoic era. Its invasion, however, was soon checked, since in the Upper Miocene epoch the Alpine folding set in, accompanied by great intrusions of ultrabasic rocks. This folding continued long enough to involve the Sarmatian deposits on the south flank of the Caucasian chain. Dr. Oswald, with the aid of a map, explains the grouping of the main lines of folding, and discusses the breaking up of the highlands into elevated plateaus and regions of depression. He regards the volcanic phenomena as manifested along planes of fracture. When these, in Upper Miocene times, reached down to the ultrabasic regions, peridotites rose among the folded rocks. Regions of decreasing basicity have since been drawn on, and only the higher zones are now penetrated, as is evidenced by the recent rhyolitic lavas of the crater of Nimrud.

An interesting lecture on "Vegetation and Rainfall," recently delivered at Perth, Western Australia, by Dr. A. Morrison, is reported in the *West Australian* of August 4. The author does not deal specially with the distribution of rainfall in the colony, but with the importance of a plentiful water supply and the warmth of the sun on vegetation generally, and on the influence of the latter in preserving the moisture of the soil. On hill-sides, without the protection of vegetation, the natural streams become choked with debris, causing floods and devastation in the country below, but vegetation gives time for water to percolate the soil without displacing it. The cosmic causes of rainfall must be carefully distinguished from local causes, which only modify the precipitation brought from distant parts. Irrigation during the dry season would do much in maintaining the desired moist condition of air and soil, and the plantation of trees would help to make it permanent; but when the settler has cleared the bush for cultivation he sometimes finds that a heavy fall of rain will run off the surface without having time to sink into the ground. The author considers that a large proportion of the country in Western Australia should be left in its original state, clothed with forests.

WE have received a separate copy of Prof. L. Palazzo's paper on his magnetic survey of Sardinia, which appeared last year in *Terrestrial Magnetism and Atmospheric Electricity*. While the eastern side of the island appears to be normal, the western shows great abnormalities which are not due to surface rocks. While the equal vertical force lines run nearly east and west across the island, the equal horizontal force lines, which have the general direction north-east to south-west, are disturbed at points near the middle and north end of the west coast. The isogonic and isoclinic lines show irregularities near the same points. The annual secular changes are:— in west declination,  $-4.6'$ ; in inclination,  $-1.5'$ ; in horizontal force,  $+0.00020$  dyne per unit pole.

THE *South African Journal of Science* for June contains an important paper by Dr. D. M. Tomory on modern methods of water purification. The Modder River water,



from which Bloemfontein draws its supplies, refuses to settle clear, and cannot be effectively purified by sand filters, which, however, are very soon choked by the suspended clay. A remarkable improvement was effected by precipitating with lime and permanganate, and filtering rapidly through a mechanical filter, the deaths from enteric fever falling from 83 per 10,000 in 1896 and 20 per 10,000 in 1904 to 2.75 per 10,000 in 1908. In view of the necessity of increasing the plant, a tour was made to inspect the chief purification plants both in Europe and in America. England and the northern part of the States do not show many examples of river-waters of the Modder type, and appear to be admirably served by the "fool-proof" method of sand-filtration. But in Egypt and in the southern States the author found many analogous cases in which extraordinary results were achieved by chemical precipitation followed by rapid mechanical filtration. He concludes that the extraordinary rapidity of the mechanical filtration is accompanied by no special risks of pollution when it is used intelligently in conjunction with a chemical precipitation process, and that in the case of non-settling waters, which can only be purified by such a precipitation, the rapid mechanical filtration is decidedly to be preferred on the ground of efficiency combined with economy. The paper will be read with interest by many who have been compelled to limit their observations of water purification to the somewhat uniform conditions which prevail in the water supplies of Great Britain.

THE *American Journal of Science* for September contains an account of an important series of researches upon the complexity of tellurium, by Mr. W. R. Flint, of Yale University. The material used amounted to 500 grams of the redistilled metal; a series of five conversions of the basic nitrate  $2\text{TeO}_2 \cdot \text{HNO}_3$  into the dioxide gave an atomic weight 127.45, with a maximum error 0.04. The material was fractionated by repeatedly precipitating the dioxide from solutions of the chloride by the addition of a large excess of water. Four precipitations reduced the atomic weight to 126.59, whilst ten precipitations gave the value 124.32 for a fraction amounting to 23 grams. This figure does not necessarily represent the lowest possible value for the atomic weight, but it agrees well with Mendelëeff's prediction that the true value would be 123 to 126, and "is apparently the nearest approach which has yet been made to the true atomic weight of the element tellurium." The fractions less easily hydrolysed by water were also worked up, and yellow to green substances were isolated; these gave negative results when tested for the commoner elements, but gave nearly all the reactions of tellurium, and many perhaps contain an unknown homologue.

THE trials of H.M. second-class cruiser *Bristol*, completed on September 27, form the subject of an illustrated article in *Engineering* for September 30. The *Bristol* is the first British ship tried with other than the Parsons type of turbine, her propelling machinery consisting of Curtis turbines of a special character designed by the builders, Messrs. John Brown and Co., of Clydebank. This firm has taken up the Curtis turbine on account of the following reasons:—(1) the potential advantages of acquiring experience with a type of marine turbine capable of using superheated steam, as in land installations; (2) the attainment of economy at low powers, without the disadvantage of very close-fitting parts, and the extremely fine adjustments entailed thereby; and (3) the simplifica-

tion of the connections and general engine-room arrangement, and also the expectation of attaining higher efficiency by an increase in size of the individual propellers. With characteristic thoroughness, the firm first constructed experimental plant and conducted a lengthy research on several modifications of the Curtis turbine, the results of which are now embodied in the machinery of the *Bristol*. It is a pleasure to record that the result of this policy is that the *Bristol* on her official trials has secured the same mileage per unit of water consumption as has been obtained in the four ships of her class which preceded her, these having Parsons turbines, embodying the inventor's latest improvements at the date of their construction. As this is the first Brown-Curtis installation, even better results may be looked for as the experience of the makers extends.

THE syndics of the University Press, Cambridge, have entered into an agreement with the directors of the Chicago University Press to undertake the publication and sale in England and in the British colonies of books issued by the Chicago University Press. This will apply to all future publications and, subject to certain existing arrangements, also to books already published.

THE October issue of the quarterly list of second-hand instruments which he has for sale or hire has been published by Mr. C. Baker, of 244 High Holborn, London. The catalogue contains details of 1635 pieces of apparatus, and is concerned with microscopes, surveying and drawing instruments, telescopes, spectroscopic apparatus, as well as instruments for use in the study of most other branches of physics. Messrs. H. F. Angus and Co., 83 Wigmore Street, London, have also sent a copy of their first catalogue of second-hand scientific apparatus and accessories. This department has been added to the business but recently, but the list shows that workers in science will find already a good selection of instruments likely to provide the apparatus of which they may be in search.

### OUR ASTRONOMICAL COLUMN.

#### ASTRONOMICAL OCCURRENCES IN OCTOBER:—

- October 7. 5h. 6m. to 6h. 23m. Moon occults  $\delta$  Scorpii (mag. 2.5).  
 „ 10. 11h. 7m. Minimum of A'gol ( $\beta$  Persei).  
 „ 11. Mercury at greatest elongation west and visible as a morning star.  
 „ 13. 7h. 56m. Minimum of A'gol ( $\beta$  Persei).  
 „ 18-22. Epoch of the October shooting stars (*Orionids*, radiant at  $92^\circ + 15^\circ$ ).  
 „ 26. 14h. 44m. to 15h. 51m. Moon occults  $\eta$  Leonis (mag. 3.6).  
 „ 27. 22h. 52m. Venus and Jupiter in conjunction, Venus  $0^\circ 11' \text{ N}$ .  
 „ 29. 13h. 16m. Mercury and Jupiter in conjunction, Mercury  $0^\circ 21' \text{ N}$ .

A BRIGHT METEOR.—From a correspondent we have received the following particulars of a bright meteor seen at South Kensington during Monday night, October 3:—Time, 12h. 50m.; approximate path, from  $310^\circ, +35^\circ$ , to  $294^\circ, +35^\circ$ ; size, about one-third diameter of moon; duration of flight, about three seconds; no trail; colour, whitish-yellow.

REDISCOVERY OF BROOKS'S PERIODICAL COMET (1889 V.), 1910d.—A telegram from the Kiel Centralstelle announces that Brooks's periodical comet was rediscovered by Messrs. Aitken and Wilson, at the Lick Observatory, on September 28. Its position at 9h. 17.3m. (Lick M.T.) was R.A.=19h. 47m. 51s., dec.= $28^\circ 8' 39'' \text{ S}$ ., which agrees closely with the ephemeris by Prof. Bauschinger men-