

albuminoid ammonia yielded by the stagnant waters of the Dublin streets, as compared with the quantities of those substances obtained from the Liffey water receiving the sewage." Twenty-nine street waters were examined; the mud, also, left from some was examined for ammonia. The following are Dr. Studdert's deductions:—The average of free ammonia from the four samples of the river was 0.0982, or under 1.10 of a grain in the gallon; the average of albuminoid ammonia from the same is 0.0779, or under 1.12 of a grain in the gallon. The average of free ammonia obtained from the twenty-nine street waters is seventeen grains to the gallon; that is, over 170 times the like average from the river. The average of albuminoid ammonia from the street water is three grains to the gallon, or thirty-eight times the Liffey average. The maximum of free ammonia from the river only reached 0.175, or less than 1.5 of a grain to the gallon; whilst the maximum of free ammonia from the street waters was 105 grains to the gallon, that is exactly 600 times greater than the river maximum. The least impure of the twenty-nine street waters yielded nearly three times more albuminoid ammonia than the most impure sample of the river water. The average of disintegrating animal refuse in the Liffey is 0.779, or just 3.4 of a grain in the gallon; whilst the average of such refuse in the street waters is twenty-nine grains to the gallon. That much of this animal matter must, if not rapidly removed, take forms that will vaporise, seems to the writer all but certain, since the conditions for spontaneous decomposition may be said to be always present; and he concludes that the continued presence of so much dirt in the streets would go far to account for the high death-rate (33 to the 1,000, yearly), then lately recorded for Dublin, and that better scavenging and a level surface for the streets are at once required.

THE proposal for establishing a mountain exploration club in America, with similar objects to the Alpine clubs of England and Switzerland, is meeting with a good deal of encouragement, and several meetings have been held for the purpose of organising it.

MR. BRYCE M. WRIGHT, of No. 90, Great Russell Street, Bloomsbury, has just received a most perfect specimen of Fossil Turtle (*Chelonia Hoffmanni*) from the Upper Chalk of Maestricht. It is 4 feet 1 inch in length and 22 inches wide, more than twice as large as the largest English specimens from Harwich and Swanage, Dorset, and is indeed the largest known.

THE correspondent J. C., who last year sent us a query concerning the cause of death of the house-fly, writes that recently he noticed that a humble-bee had five small animals like yellow spiders on its neck, and two more on its body. He had previously noticed a number of hive-bees lying dead on the greenhouse floor. Another correspondent explained that the death of the fly was caused by parasites, and J. C. wishes to know if those on the bee are the same, and if they cause the death of bees as well as flies.

THE Lord Mayor and the Lady Mayoress will entertain the President of the Royal Society, the Astronomer-Royal, the Presidents of the Royal Colleges of Physicians and Surgeons, and other distinguished representatives of science, at a grand banquet in the Mansion House, on Saturday-week, the 13th instant.

THE opening meeting of the Northamptonshire Natural History Society and Field Club was held at Northampton on April 21, Lord Lilford in the chair. This Society starts under good auspices, with a roll of sixty members, and we hope it will soon get into vigorous working trim.

IT is officially announced that the Philadelphia Exhibition will be opened on the 10th instant.

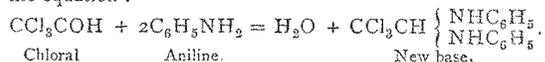
THE additions to the Zoological Society's Gardens during the past week include two Bennett's Cassowaries (*Casuarus bennetti*)

from New Britain, presented by the Rev. George Brown; an Indian Gazelle (*Gazella bennettii*) from India, presented by Lieut. King, 76th Regiment; a Common Badger (*Melestaxus*) European, presented by Mr. W. Barneby; a Dusky Ichneumon (*Herpestes pulverulentus*) from India, a broad-fronted Crocodile (*Crocodilus frontatus*) from W. Africa, presented by Dr. Alex. Jennens; four Blackish Sternotheres (*Sternotherus subniger*) from Madagascar, presented by Mr. Lionel Hart; two Protei (*Proteus anguinus*) European, presented by Sir Bartle E. Frere; a White-fronted Capuchin (*Cebus albifrons*) from S. America, a White-throated Capuchin (*Cebus hypoleucus*) from Central America, a Lyre Bird (*Menura superba*) from Australia, a Hoffmann's Sloth (*Cholopus hoffmanni*) from Panama, three Common Boas (*Eoa constrictor*) from S. America, deposited; a Collared Fruit Bat (*Cynonycteris collaris*) born in the Gardens.

SCIENTIFIC SERIALS

Journal of the Chemical Society, No. clix., March 1876.—This number contains a lengthy account of the researches of Dr. Wright and Mr. G. H. Beckett on narcotine, cotarnine, and hydrocotarnine, being the third of a series of papers read by them before the Chemical Society on their researches in this direction.—Mr. E. Neison gives an account of the sebates of the alcoholic series and an additional note on the sebate of cobalt.—A paper by Mr. P. F. Bedson, B.Sc., on some compounds of ether with anhydrous metallic chlorides, and one by Mr. R. W. Emerson MacIvor, on the iodides of antimony, complete the list of those papers read before the Chemical Society.—Numerous abstracts of papers published in other journals on various bodies in the different departments of chemistry occupy the greater part of the work now before us.

Gazzetta Chimica Italiana, Fascicolo IX. e X., Anno V., 1875, These parts contain the following papers:—Action of anhydrous chloral, and of the hydrate on aniline, by D. Amato. The author has obtained by this reaction a new base formed according to the equation:—



The new substance forms square tabular crystals melting at 100°, soluble in alcohol, ether, and benzene, and insoluble in water. Distilled with excess of potash it yields phenylic cyanide:—



The author describes also the hydrochloride $\text{CCl}_3(\text{NHC}_6\text{H}_5)_2\text{HCl}$, and the platino-chloride $[\text{CCl}_3\text{CH}(\text{NHC}_6\text{H}_5)_2\text{HCl}]_2\text{PtCl}_4$.—Study of essence of Cubibs, by A. Ogliarolo. The author shows that this substance contains:—(1) a small quantity of a hydrocarbon $\text{C}_{10}\text{H}_{16}$, boiling at 158°—163°. 2. A hydrocarbon $\text{C}_{15}\text{H}_{24}$, boiling at 264°—265°, forming with hydrochloric acid the compound $\text{C}_{15}\text{H}_{24} \cdot 2\text{HCl}$. 3. A hydrocarbon boiling at 262°—263° not forming a compound with HCl, the composition of which is at present doubtful. The action of these hydrocarbons on the polarised ray is also described.—On the natural poison of the extract of human bodies, by Prof. A. Moriggia and A. Battistini. The remainder of the part is occupied by extracts from foreign journals.

Foggendorff's Annalen der Physik und Chemie. Ergänzung. Band vii. Stück 3.—In a paper in this number on the magnetism of steel bars, by M. Fromme, it is shown that the temporary magnetism increases at first more slowly, then more quickly, and again more slowly than the magnetising force. M. Fromme also got the interesting result that when the remanent magnetism, through repeated action of a force P , has reached its limit, (the saturation corresponding to this force), a smaller force, p , is not capable of altering it. For every permanent moment of a steel bar there are, from zero onwards, a series of magnetising forces, in relation to which the bar has the properties of a bar of soft iron (without coercive force). Exact determinations were made of the function of magnetisation for forces having this effect; and it is shown that the Neumann-Kirchhoff developments on this subject cease to hold good as soon as the steel is permanently magnetic. M. Fromme further finds that the temporary magnetism of a steel bar, with repeated magnetisation by a constant current, decreases, but in such a way that the whole magnetism

remains unchanged; thus, what is gained in remanent magnetism is lost in temporary.—Dr. Dibbit observes that ammonium-sulphate, ammonium-oxalate, and ammonium-acetate, in boiling solution, are partly decomposed, on addition of equivalent quantities of the chloride or the nitrate of potassium, sodium, or barium; that decomposition is greater, the greater the quantity of chloride or nitrate added; and that in all cases the solution contains, at 100°, four salts. From other experiments he infers that the presence of salts in ammonia solution increases the quantity of evaporated ammonia in relation to the evaporated water (even where the salts are such as enter into known combinations with ammonia), and this both at the ordinary and at the boiling temperature.—M. Holtz calls attention to the polar electric attraction of fine particles suspended in liquids when under the influence of electric currents. There is always, along with the movements of translations, an attachment to one pole or the other; very well seen with lycopodium powder in sulphuric ether. Some substances seem indifferent, neither wandering nor clinging to the poles, but if the bottom of the vessel be clean and free from air moisture, they form into beautiful, regular, characteristic figures. These may be had, *e.g.*, with finely-powdered manganese, or iron oxide, or sawdust, in petroleum, oil of turpentine, benzine, or sulphuric ether. The figures are rarely long stable; they show various internal movements, not essentially altering the character of the figure; and there is sometimes rotation.—M. Sohncke advances a new theory of crystalline structure, based on unlimited regular point systems; and Dr. Exner gives an account of his recent researches on galvanic expansion of metallic wires; which are noticed elsewhere in our columns.

Zeitschrift der Oesterreichischen Gesellschaft für Meteorologie, Jan. 15.—Dr. Mohn contributes an article to this number on the causes of the greater depressions of the barometer in winter than in summer. His present views on this subject are different from those given in his work on meteorology. He explains that in order that a barometric minimum may attain a great depth, the ascending current must develop itself with ease and rapidity. Therefore, besides high temperature and a large amount of vapour, the air supplying the ascending current must possess qualities unlike those of the surrounding atmospheric region, so that the ascended air may flow off easily at great heights. The easier barometric maxima can be formed, the easier the development of minima. In winter the strong continuous radiation over the Continent tends to create maxima; the cooling of the air over the sea is moderated by the quantity of vapour always present and by the ocean temperature, so that minima are formed. In summer opposite conditions prevail, but no nightly radiation comparable to that of the land in winter can occur, and thus only small depressions are observed. In a similar way the low pressure of the antarctic zone between lat. 70° and lat. 75° may be understood to be caused by the position of this region between two districts with high pressure, the one northwards about the tropic of Capricorn, the other the great Frozen Antarctic Continent. Between these two maxima lies an unbroken sea developing conditions favourable to the existence of minima.—The next paper is by Dr. G. Hellmann, on the daily period of rainfall at Zechen.

Journal de Physique, January.—The substances used in thermometers are generally such as are not in the neighbourhood of their change of state; but (as M. Duclaux here shows) by using liquids that are near critical periods, very sensitive instruments may be had. Thus, if we mix 10 c.c. of crystallisable acetic acid with 5, 10, 15 c.c. of benzine at about 20° we have, in each case, a homogeneous mixture; and in cooling the three liquids we come, with each, to a point at which it is troubled, and at length divides into two layers. The upper layer is found nearly always to contain one-third of acetic acid for two-thirds of benzine; while the lower contains two-thirds of acetic acid and one-third of benzine. There are few combinations of two liquids that show small variations so distinctly as this one (acetic acid and petroleum is another). But a good mixture may be had by taking 10 c.c. of amyl alcohol, 25 c.c. of alcohol at 50°, and adding enough water to produce a slight opalescence. The least fall of temperature divides the mixture into two layers of nearly equal volume. Such a mixture will serve to show, *e.g.*, the cold produced by solution of marine salt in water. By varying the quantity of water the mixture may be so made as to become troubled at any temperature desired; and so a series of minimum thermometers may be constructed. A little carmine may be used to make the changes more apparent.—M. Deprez, in this

number, gives some useful directions on the construction of electro-magnetic registers; and M. Branly describes the electrometer he uses for measuring electromotive force, resistance, and polarisation.

SOCIETIES AND ACADEMIES LONDON

Chemical Society, April 28.—Prof. Andrews, F.R.S., delivered a most interesting lecture on certain methods of chemical research (see p. 12).

Anthropological Institute, April 25.—Col. A. Lane-Fox, president, in the chair.—Dr. Comrie, R.N., exhibited his collection of weapons and articles of domestic use from New Guinea, and added several particulars to his previous remarks.—Mr. A. Tylor, F.G.S., read a paper on the origin of numerals. He held that inventive thought had always an object origin, and mentioned measures of length, as pace, foot, hand, &c., as having such a source. Also in the Ptolemaic hieroglyphics, a minute or second was shown by an eye-winking, answering to "the twinkling of an eye." Illustrations of the Abacus and mode of calculating by it were exhibited, and shown to be in principle the origin of the modern calculating machine. The dream of a universal language has been realised, as far as numerals and arithmetical figures are concerned, and this is due to their origin.—A paper by Mr. A. L. Lewis was read on some apparent coincidences of custom and belief in Chaldaea and other countries. He alluded, amongst other points, to the marks of finger-nails upon the terra-cotta deeds that had been discovered at Nineveh. They appeared to him to answer to the practice of touching the seals of legal documents with the finger. As regards the belief of the Assyrians in immortality, souls were either united with the sun, or descended to "Bit-Edie," Annwn, the country of the dead, in like manner amongst the Kymry was situated in the lower regions, at the going down of the sun in the west. The children of Anu, or the Sky, in Assyria, may be compared with "Cum Annwn," spirits, believed in by the Kymry. Amongst the Assyrian gods, Hed answered to the Lycian deity "Hu." Civilisation appeared to originate with the Turanians, the Semitic race merely succeeding to it.—The President, Mr. A. Smee, Mr. Distant, and others, took part in the discussion.

Physical Society, April 29.—Prof. Gladstone, vice-president, in the chair.—The following gentlemen were elected members of the Society: Prof. F. Fuller and Capt. E. H. White.—The Secretary read a communication from Sir John Conroy, Bart., on a simple form of heliostat. The defect of Fahrenheit's heliostat, in which the beam of sunlight is deflected by a mirror moved by clock-work in a direction parallel to the axis of the earth, and then in the required direction by a fixed mirror, consists in the great loss of light. The author substitutes two silvered mirrors for the looking-glasses usually employed, and he has shown that the loss of light with this arrangement is less than when the light is once reflected from a looking-glass.—Mr. S. P. Thompson then made a second communication on the so-called "Ethereic Force," and described some experiments which he has recently made in the Physical Laboratory at South Kensington on the subject. The name was given by Mr. Edison, the inventor of the motograph, to the sparks obtained when a conductor is presented to the core of an electro-magnet, the coils of which are traversed by an intermittent current. The results of the experiments conducted as originally described not proving satisfactory, various other arrangements were tried, and it was found that if the secondary current from an induction coil be used, instead of a current direct from the battery, the effects are much more marked. When the induced spark was diverted either wholly or partially into a short coil which was insulated very perfectly from the core inside, a spark about half an inch in length, which had a decided effect on the nerves could be drawn off from the core, and this was sufficient to illuminate a small vacuum tube; the spark, however, does not exhibit the usual signs of polarity. It was shown by observing the illumination thus produced with a rotating mirror, that the discharge is in reality a reciprocating one, each spark returning on its path after a minute interval of time. Under certain conditions it is also possible to charge an electroscope either positively or negatively by means of the spark, and Mr. Thompson has shown that the spark ignites a jet of gas but fails to deflagrate metallic wire or ignite gunpowder. From the above, and other