

carpus pinnatus Lem., belonging to the Rutaceæ. It is stated that this drug has been used with great success in France, and that it is looked upon "as an incomparable diaphoretic and sialogogue." Dr. Gubler expresses himself in the belief that it "will be the first indisputable example of a diaphoretic truly worthy of the name; that is to say, a medicine having the power of provoking directly by an electric action the secretion of perspiration."

IN the same manner as the lichen dyes have been superseded by those derived from coal tar, so the demand for madder roots seems to be rapidly falling off, owing to the discovery of alazarine. In a report on the trade of Beyrout, it is stated that heavy losses have been incurred in the article, owing to its great fall in value in the English markets from the cause above stated; indeed it is said that so far as England is concerned, the trade in this article with Beyrout has almost, if not quite, ceased. Its cultivation, however, in this neighbourhood, has never been on a very extensive scale, being confined to a few outlying districts; it is, moreover, very exhaustive to the soil. Nevertheless, in the early part of the year 1872, 2,300 cwt. of the value of 5,728*l.* were shipped from Beyrout to English ports.

WE have just received the publications of the "Bataviaasch genootschap van Kunsten en Watenschappen" for 1873. In the "Tijdschrift" is a short paper on Rotti, by Mr. Jackstein, a missionary in the island, followed by another paper by him on the Rotti words in use by the Malay-speaking people in the district of Koepang. Several papers are devoted to the accounts of the suppression of piracy, which has so long been a characteristic of the Malay race. Dr. Adolf Meijer has also communicated a paper On the Language spoken in Mendanao, Solog, &c.

PROF. WILLIAM M. GABB, of Philadelphia, who is at present engaged in an exhaustive geological exploration of Costa Rica, has lately made a very important discovery in reference to the sedimentary rock on the Atlantic slope of Costa Rica, namely, that even such portions as are auriferous are not earlier than the Tertiary. Indeed, in Prof. Gabb's opinion, they are of Miocene age, which is, of course, strongly in contradiction of the hypothesis of Sir Roderick Murchison, that gold is of Silurian origin.

THE last part of the Transactions issued by the Geological Society of Manchester contains a paper by Mr. S. Aitken, On the Discovery of the new Fish of the Genus *Acrolepis* Ag. in the millstone grit near Habden Bridge, Yorkshire. There is also a paper On the Economic Value of Heat Fuels, by Mr. Plant.

A CURIOUS phenomenon happened at Belfast recently while some men were sinking a well. A light having been let fall, a flash overspread the bottom of the well; and a pipe about 60 ft. long having been conveyed from the bottom of the well to the second storey of a building, the gas was ignited, and continued burning all day. The strata passed through in digging the well were esturine, clay, gravel, boulder clay, and New Red sandstone. The gas has been proved to be marsh gas (carburetted hydrogen) probably generated in the decomposed vegetable matter, which abounds in the lower stratum of the esturine clay, in which were also vast numbers of fossil shells.

ONE of the most elaborate mineralogical papers that has appeared for some time in the United States, with the exception of Dr. Gem's on corundum, is that by Prof. Josiah P. Cooke, jun., upon the vermiculites, and their crystallographic and chemical relations to the micas, together with a consideration of the variation of the optical angle in these minerals. This appears in the Proceedings of the American Academy of Arts

and Sciences, and is to be considered as a very valuable contribution to the science of mineralogy.

WE have received a very interesting map of Victoria showing the distribution of forest trees in that colony by an ingenious arrangement of different colours. It is compiled by Mr. Arthur Everett from the Record Maps in the Office of the Surveyor-General, under the direction of Mr. R. Brough Smith. The map is accompanied by notes on the various trees by Dr. F. von Mueller, Government Botanist.

A MADEIRA correspondent writes us concerning the damage caused to objects of natural history from cedar-wood cases. A naturalist in Madeira, to do his collection of the remarkable land shells of the island more honour, had made for them a case of this wood. Unobserved for a month, the shells were found drenched with the turpentine resin exhaling from the wood. Shells covered with a rough epidermis seemed to have attracted the oil less. *Craspedopoma*, and the smooth fresh-water shells had specially suffered; semi-fossils full of sand had escaped; all others, whether recent or semi-fossil, had suffered to such an extent that the cardboard to which they were attached was in many cases soaked. This occurred, however, only when the affixed shells offered the needful point of attraction and condensation.

WE have received an appendix to the Annual Report for 1873 upon the Survey of the (U.S.) Northern and North-western Lakes in charge of Major C. B. Comstock. Notwithstanding much unfavourable weather, a great deal of work has been done. It was expected that a continuous chain of triangulation, reaching from St. Ignace Island, on the north shore of Lake Superior to the southern end of Lake Michigan, a distance of 500 miles, would be completed during 1873. It has been measured with sufficient precision to give an arc of the meridian 7° in length. This is the longest arc measured on the American continent, and it is hoped to extend it further south.

THE additions to the Zoological Society's Gardens during the last week include a Capybara (*Hydrocharus capybara*) and a Coypu (*Myopotamus coypus*) from S. America, presented by Dr. H. Young; a Garnett's Galago (*Galago garnetti*) from E. Africa, presented by Mr. R. H. Cusack; an African Civet Cat (*Viverra civetta*) from the Gold Coast, presented by Mr. W. B. Ramsay; a Grey Ichneumon (*Herpestes griseus*) from India, presented by Mr. H. Humphry; a Sun Bittern (*Eurypyga helias*) and seven Upland Geese (*Chloephaga magellanica*) hatched in the gardens; a Black Saki (*Pithecia satanas*) and a Red-backed Saki (*P. chirotopos*) from S. America, deposited; and a Blue-faced Green Amazon (*Chrysotis bouqueti*) from Honduras, purchased. Of this last-named bird Dr. Finsch, in his monograph on the parrots, remarks that he has never been able to find a skin in any of the many museums to which he has had access.

SCIENTIFIC SERIALS

THE *Journal of the Chemical Society* for March contains the following papers read before the Society:—On the preparation of standard trial plates to be used in verifying the composition of coinage, by W. Chandler Roberts, chemist of the Mint. The author had been instructed by the Lords of the Treasury to prepare new plates of gold and silver for comparing annually with the coinage being issued, in order to guarantee the fineness of the latter. The gold plate consists of an alloy of copper and gold ranging in composition in its different parts from 916.5 to 916.7 parts of fine gold in 1,000 (the standard is 916.66). This plate did not present much difficulty in its preparation, since the two metals were obtained in a state of perfectly homogeneous mixture after repeated meltings. The silver plate presented much greater difficulty owing to the tendency of the silver to concentrate itself in the centre of the mass. The difficulty was overcome by casting the alloy into a plate, which was then planed down on both surfaces and afterwards greatly extended by roll-

ing; a portion cut out from the side of this plate served for the new trial plate. Its composition ranges from 924.6 to 925.1 parts of pure silver per 1,000 (925 being the standard). The author has also constructed supplementary plates of pure silver and gold. An interesting table of assays of trial plates from 1477 down to the present time is given.—Mr. J. Hannay contributes a description of a sp. gr. apparatus for temperatures other than atmospheric.—Dr. Gladstone and Mr. Tribe give the fourth part of their researches on the action of the copper-zinc couple on organic substances. They have now turned their attention to the series containing the C_nH_{2n-1} radicals, the first body acted upon being iodide of allyl, which yields with the dry couple a resinous body of the formula $n(C_3H_4)$, but when mixed with ether rapid decomposition sets in at ordinary temperatures, and the ethereal solution gives zinc oxide on mixing with water. All attempts to isolate zinc-allyl have, however, failed. Allyl iodide and water acted upon by the couple give propylene $C_3H_6I + H_2O + Zn = ZnI.HO + C_3H_6$. The iodide mixed with alcohol is acted upon violently by zinc alone yielding propylene $C_3H_5I + C_2H_6O + Zn = Zn \begin{cases} C_2H_5O \\ I \end{cases} + C_3H_6$.—On ferrous anhydro-sulphate, by T. Bolas. A mixture of 10 per cent. of a saturated aqueous solution of ferrous-sulphate with oil of vitriol deposits, on cooling, small white prismatic crystals having the formula FeS_2O_7 . When exposed to moist air the anhydro-sulphate yields granular crystals of the formula $FeSO_4.6H_2O$.—On tetranickelous phosphide, by Dr. R. Schenk. This substance (Ni_4P_2) was obtained by adding a sufficient quantity of tartaric acid to a solution of nickelous chloride, to prevent precipitation by potash, boiling the potash solution with phosphorus and then drying the precipitate in a stream of hydrogen. The remainder of the journal is devoted to the usual abstracts from other journals, British and foreign.

Poggendorff's Annalen der Physik und Chemie, No. 2, 1874.—In the commencing paper, by M. Hermann Herwig, it appears demonstrated that the conducting power of mercury, for heat, is perfectly constant between 40° and 160° .—A continuation of Julius Thomsen's Thermo-chemical Recherches treats of several agents of oxidation and reduction; and in the next paper, Dr. Röntgen discusses several points connected with M. Kundt's dust-figures (produced when a metallic plate, strewn with lycopodium, receives an electric spark): the dependence of the size of the dust-circle on the nature of the gas in which the discharge occurs; on the thickness of the lycopodium layer; on the distance of wire-point from plate; and on the kind of electricity that is in the plate. He also studies the mode of production of the figure, the nature of the discharge, and the phenomena to which Prof. Guthrie lately called attention.—The concluding portion of M. Braun's paper on elastic vibrations whose amplitudes are not infinitely small, is given. Various experiments were made with steel rods, and it is shown that the pitch of tone decreases if the amplitude increases, and that with high tones the influence of amplitude is greater than with low. The deadening is dependent on pitch of tone (being greater for higher tones), on amplitude (the influence of which is also greater the higher the tone), and on figure of vibrations (those in one direction being more deadened when there are simultaneous vibrations in the direction at right angles).—This article is followed by a translation of Prof. Roscoe's account of a self-registering instrument for meteorological measurements of light.—A paper by M. Friedrich C. G. Müller (first part) has for its subject galvanic polarisation, and the distribution of the current in electrolytes. The author's experimental plan was (1) to vary the section and length of a parallelepipedal electrolyte, and the size of the pole plates, and determine each time the resistance; (2) to insert metallic conductors of small resistance (e.g. thick copper-wire) in the long direction of the liquid conductor, but not touching the electrodes, and measure the increase of conduction; (3) to measure the current-density in different portions of any section by the electrolytic action taking place on a small plate brought to that part.—M. Avenarius has a paper On internal latent heat, in which he arrives at the conclusion that the temperatures (determined by direct observations) of the volatilisation of a liquid in a hermetically-closed space, perfectly agree with those calculated on the basis of empiric formulæ for internal latent heat. The experiments were made with ether, sulphide of carbon, chloride of carbon, and acetone.—Prof. Julius Kohn proposes a simplification of König's method of manometric flames, doing away with the membrane, and making the sound pass from the mouth of an organ-pipe, e.g. through a narrow glass tube,

directly to the base of the flame (whose motions are mirrored in the revolving case, as usual).—In an article On the motion and action of glaciers, Dr. Pfaff describes some very delicate measurements he lately made on the Aletsch glacier, which seemed to prove that the progressive motion of the ice took place without any break. A minimum motion of 8 mm. per hour was observed at noon, and a maximum of 30 mm. about 5 P.M.; the latter being thus nearly four times the former. Dr. Pfaff also urges a number of considerations against certain theories of valley-formation by glaciers.—The only remaining paper is one On function of magnetisation of various iron bodies, by Prof. Stolewof, of Moscow.

Der Naturforscher, March.—In this number are described a series of experiments by M. Hansemann, who considers they demonstrate the production of a difference of temperature, in columns of air, by the attraction of the earth.—An account is given of recent observations by Dr. Boltzmann, on what he calls "dielectric action at a distance." If the hypothesis be correct (he argued), that in the molecules of an insulator, by electric forces, positive electricity is driven to one side and negative to the other, then an originally unelectricified, insulating body brought near one which is charged with electricity, must be attracted by it, simply through dielectric polarisation of the molecules, and without conduction; in fact, as a piece of soft iron is attracted to a magnet. Experiment confirmed this; and he determined, by his new method, the "dielectric constants" of several insulating substances.—We might here also call attention to M. Barthelemy's striking experiments in vibration forms, produced at the surface of liquids by means of vibrating tuning-forks. In square vessels containing mercury, systems of bright lines appear parallel to the sides, and the breadth of the waves is in inverse proportion to the number of vibrations. In this way is explained Prof. Tyndall's observation that many liquids are not set in wave-motion by vibrations. Such is the case when the breadth of the waves is greater than the breadth of the vessel; there can only then be a motion of the whole surface. The distance between two lines corresponding to the same pitch of fork is found to be independent of the density of the liquid. M. Barthelemy experimented also with round, three-cornered, and elliptical vessels, and on the rhythmical vertical flow of water from narrow orifices.—M. Spörer adduces evidence of the presence of ascending and descending currents in the atmosphere of the sun.—There are also, in the physical department, notes of Helmholtz's researches on galvanic polarisation in gasless liquids, Lockyer's on spectrum analysis of metals, Tyndall's on conduction of sound through the atmosphere, &c.—In geology, we find a summary of M. Laube's late observations as to the evidence of a much more intense Ice-period in Greenland than the present; while M. Fuchs describes the geological formation of the region about Nizza, south of the Maritime Alps.—Two curious cases of mimicry in the Articulata are discussed in a note by M. Gerstaecken, who theorises on the nature of the general phenomenon; and there is, in the same section, a paper by M. Milne-Edwards, in which the colour of birds is studied in relation to their geographical distribution.—In botany, lastly, the following topics are treated; immigration of a rust fungus, *Puccinia malvacearum* (from Chili); light and the regeneration of albuminous matter from asparagine; and the electrical phenomena in the leaves of *Dionæa*.

SOCIETIES AND ACADEMIES

LONDON

Royal Society, April 30.—On Leaf arrangement, by Hubert Airy, M.A., M.D. Communicated by Charles Darwin, F.R.S. Received March 23, 1874.

The author is led to suppose:—

I. That the original form of leaf-arrangement was two-ranked.

II. That this original two-ranked form gave rise to forms with 2, 3, 4, 5, 6, 7, &c., ranks, by "sporting," as opposed to any process of accumulative modification.

III. That, of the orders so formed, those with an even number of ranks (except 2) have, as a rule, assumed a *whorled* arrangement, and those with two or an odd number of ranks have assumed an *alternate* arrangement, under the need of lateral accommodation of ranks in the bud (taken as type of close-packed forms).