tube instead. Nos. (1) (2) and (3) were found to be considerably altered after having been exposed to a high temperature. The instruments were placed in an ordinary fire and repeatedly heated to a red heat, at which they were maintained for several hours. The original resistance was ten units. The following numbers show the increase of resistance :—

(1) 0·834 (2) 1·608 (3) 1·169

These numbers expressed as fractions of the original resistance become (1) ·0834 (2) ·1608 (3) ·1169.

Equivalent change of temperature = (1) 30°, (2) 58°, (3) 43°. These measurements show that the change in resistance produced by exposure to high temperatures is so great as to invalidate the usefulness of these instruments.

No. (4). Resistance increased ·046, which expressed as a portion of the original resistance = ·0046. Equivalent change of temperature = 1°·5. The last instrument therefore gives results which are sufficiently constant for industrial application if not for strictly scientific purposes.

Prof. Williamson suggested that the change in the resistance might be due to a change in the platinum, as it has been found that platinum in contact with silica, in a reducing atmosphere, is altered at high temperatures.

Report of the Committee appointed to prepare and print tables of Wave Numbers.

Mr. G. J. Stoney stated that the work of this Committee was in progress, and that the Committee hoped to be in a position to make a full report at the next meeting of the Association. Under these circumstances they merely asked to be reappointed.

Second Report on the Sub-Wealden Exploration. By H. Willett and W. Topley.

This Report gave an account of the progress of the work since the last meeting of the Association. Most of the results attained have been already made public through the Quarterly Reports, and they were recently summarised in these columns. At the time of the Bradford meeting only 300 feet had been reached, and the age of the beds then being traversed was unknown. Mr. Peyton and Prof. Phillips discovered Kimmeridge Clay fossils immediately after the Report was read ; since that time a large collection of fossils has been made, including most of the characteristic English Kimmeridge species, and some which are new. An undescribed species of *Modiola* is very abundant, and so is a small *Astarte*—the *A. Mysis* of D'Orbigny. A new species of this genus has been found, and a small *Trigonia* which Dr. Lycett believes to be also new.

The Kimmeridge Clay appears to be nearly 700 feet thick ; generally it is a rather sandy clay, but towards the base there are some thick bands of cement stone. The Coral Rag is apparently absent. Amongst the fossils from the Oxford Clay the following were noticed :—*Ammonites Jason, Am. Lamberti, Am. Sedgwicki, Pollicipes concinnus, Gervillia*, and *Macrodon*. The total depth now reached is 1,030 feet, and 3,000*l.* has been spent. The Association has voted an increased grant of 100*l.*, and the Government has promised aid to the extent of 100*l.* for each 100 feet completed below 1,000 feet ; but as each 100 feet will cost from 300*l.* to 400*l.* (including the cost of lining the hole), the Committee trust that subscriptions will still be forthcoming to enable them to continue the work.

Report of the Committee on the Influence of Forests on Rain.—It appeared from the very lengthened report that the operations of the committee during the past year had been restricted to the meteorological observations made at Carnwath, Lanarkshire. In order to carry on the operations at Carnwath, and extend them, a grant from the Association of not less than 25*l.* would be required for next year. They did not propose to commence observations at any new station.

SCIENTIFIC SERIALS

The Journal of Mental Science, July 1874—Dr. Nicolson proceeds with his Morbid Physiology of Criminals, discussing, on this occasion, prison discipline as a test of mind ; and he finds a large number of prisoners who, tried by this test, he must class together as "weak-minded." In spite of his strong common sense, Dr. Nicolson at times betrays amiable leanings towards the hopeful rather than towards a perhaps unpalatable truth. We must confess ourselves among the "sceptics" from whom "the sight of a class of adult and veteran criminals plodding away at their books in the halls of a prison" "would but draw an ominous shake of the head." Granting that the book education of criminals could be carried further than there is any reason to believe possible, the assumption remains that this would tend more than any other form of discipline to make them less criminal than before—the only thing in which society has any special interest concerning them. The "weak-minded" criminal, being on the border line of sanity, is naturally a perplexing subject to the prison authorities. In dealing with him practically Dr. Nicolson's sagacity might be fully relied on, though in such expressions as "we can *punish* badness, but we must *treat* madness," there is implied a sharp line of distinction which exists only in our phraseology. Madness ought to be punished when that is the best treatment ; and badness ought to be treated when treatment is the best remedy. —In an interesting paper On children fostered by wild beasts, W. W. Ireland, M.D., favours the opinion that there is not a single authentic instance of the kind.—J. H. Balfour Browne, barrister, makes a psychological and medico-legal problem of the character of Léonce Miranda, the hero of Mr. Browning's Red Cotton Night-Capt Country ; and by intensely commonplace standards of measurement concludes that Léonce was mad. We sincerely hope his principles of judgment will never find place in the deliberations of actual legal tribunals. It would be a terrible prospect to think that our wills might be set aside at the instance of greedy relatives on the ground that we were somewhat "anomalous," not exactly like the herd "in our mental constitution ;" "to say which," says Mr. Balfour Browne, "is only to say that a man is insane." Perhaps "all the doctrines of Rome will not make a *practical* man who *professes* its creed believe in a nowadays miracle ;" but what is the worth of the statement ? Strike out the word *practical*, which here means stupid, and give the sentence definite meaning by substituting *believes* for *professes*, and the proposition becomes a contradiction in terms. But to be logical may be to be insane, according to the wisdom of our practical men who profess instead of believing.—The Morisonian Lectures ; The treatment of insanity, abstracted from Drs. Bucknill and Tuke's chapter on that subject ; Clinical notes and cases ; Notes of the quarter, and reviews, make up the number. Dr. Carpenter's "Mental Physiology" is the most important review. His defence of the old free-will doctrine is severely handled ; and an attempt, not quite so successful, is made to set aside the theory of unconscious cerebration.

Journal of the Franklin Institute, July.—Among the matter contained in this number is the first instalment of an elaborate paper by Mr. J. A. Henderson, M.E., On the theory of aëro-steam engines, which, an editorial note informs us, is the first theoretical treatise on the subject that has appeared to complement the work of the late Prof. Rankine on other heat-engines. The "Principles of Shop Manipulation" is continued by Mr. J. Richards.—Chief Engineer W. H. Shock, U.S. Navy, under the head of "Strength of Materials," gives an account of a series of very carefully conducted experiments on bolts of various dimensions, under the two possible conditions—double cut and single cut—in which they might be used in connection with the bracing of boilers, and for other purposes.—There is a translation of M. Baudrimont's paper, On the tenacity of malleable metals at various temperatures.—Mr. C. J. Wister, in a paper On the moon's figure as obtained in the spectroscope, objects to Gussew's deductions from De la Rue's photographs of the moon at the extremes of her librations.—Prof. Thurston's paper On the mechanical properties of materials of construction, is continued.

The American Naturalist, August.—On the Flora of Southern Florida, by Frederick Brandel. The question considered is whether the flora of Southern Florida and the Keys is really North American or South Indian ; and the conclusion reached is that it is not North American, but a link between it and that of the West Indies, and that a portion of those species which are peculiar to the northern portions of the State and the immediately adjacent region may have been derived from the south.—The Classification of the Rhynchophorous Coleoptera, by Dr. John L. Leconte.—Herbarium Cases, by Dr. C. C. Parry. A case is described, with a woodcut, specially designed for being readily moved.—A Key to the higher Algæ of the Atlantic Coast between Newfoundland and Florida, by Prof. D. S. Jordan. Part II. Rhodospermeæ. Part III. Chlorospermeæ. An etymology of names of genera is appended.—Under the section Zoology a new species of North American

bird is described, named *Tringa ptilocnemis*.—In the Mammoth Cave Mr. A. S. Packard met with a new Japyx, to which he has given the specific name "*subterraneus*."

Astronomische Nachrichten, No. 2,003.—This number contains a paper by W. A. Rogers, of Harvard, On the orbit of the minor planet Felicitas (109). The elements and perturbations are given. Tacchini gives a number of observations of Coggia's comet, made with the meridian circle at Palermo. Schmidt also gives a list of observations of the position of the same comet for almost every night from May 3 to July 15. Schulhof gives several sets of elliptic elements for Coggia's comet, and it appears that it may be the same body as was seen in 1734, and so having a period of 137·1 years; or it may have a period of 12184·3 years, as shown by another set of elements. The author also adds an ephemeris from Aug. 31 to Oct. 6. D'Arrest also gives observations on this comet.—Dr. Zenker contributes a note On the light of the comet being polarised in a plane passing through the sun and comet, showing the presence of reflected sunlight.—Konkoly adds a note On the spectrum of the comet.

No. 2,004 contains a catalogue by Engelmann of the positions of fixed stars.—Pogson gives his observations on Biela's comet, made in November and December 1872. At Madras, on Nov. 2, at 17h. 31m. 1·3s. Madras mean time, its R.A. was 14h. 7m. 12·66s., and P.D. 124° 45′ 21·1″; and on Dec. 3, at 17h. 13m. 11·3s. its R.A. was 14h. 21m. 55·11s., and P.D. 124° 4′ 37·5′ —Prof. Watson gives the elements and an ephemeris of Aethra (132).—Winnecke and Bruhns contribute notes on the positions of Borrelly's comet, and Dr. Holetschek has calculated the following element and ephemeris:—

T = Aug. 26.7199 Berlin time.

π = 343° 57′ 50″
Ω = 251 44 18
i = 41 55 32
Log. q = 9·99292

	R.A. h.	m.	s.	D. °	′
Aug. 26 . .	12	33	48	+ 74	4·0
,, 30 . .	11	58	19	+ 74	20·7
Sept. 15 . .	9	50	27	+ 72	0·6
Oct. 1 . .	8	22	21	+ 66	17·0

Zeitschrift der Oesterreichischen Gesellschaft für Meteorologie, Aug. 1.—The first article in this number is a statement by Capt. Hoffmeyer, director of the Royal Meteorological Institute at Copenhagen, of his plan, already noticed in NATURE, vol. x. p. 146, by Mr. R. H. Scott, for publishing daily weather charts for Europe and part of the Atlantic. It is here illustrated by a specimen chart. Next follows an examination by M. Raulin of the distribution of rain in Turkey in Europe and neighbouring parts. Observations were made at Pirano and Trieste between 1787 and 1807, and since 1841; in Corfu since 1845; at Ragusa since 1851; and at other stations, of which five are outside the peninsula, in later years. All the stations are near the margin of this large region, so that the weather of the interior is not yet well known. M. Raulin divides the year into two periods, a cold one from October to March, and a warm one from April to September. The practical significance of this division is that the rainfall of the warm period satisfies the immediate wants of vegetation, while that of the cold season goes mainly to the supply of wells and rivers. The rainfall at Fiume is very large, also at Ragusa, Janina, and Corfu, but very small at Athens and Smyrna. France has been divided into districts, each having its peculiar distribution of rain through the year, and the same method is adopted here. The first district, like the plain of Northern Europe, has more rain in summer than in winter, and includes Austria, Carinthia, Styria, Hungary, Southern Russia, and the Lower Danube, to Bucharest. Laibach belongs to the second district, having a rainfall steadily increasing from winter to autumn. To the third, with a very dry winter and summer and very wet autumn, belong St. Magdalena, Trieste, and Semlin. To the fourth, with a dry summer and rainy autumn, Dalmatia, Albania, Athens, Pera, and Scutari. Among the "Kleinere Mittheilungen" we have an interesting account of the climate of the Isthmus of Tehuantepec, from a report of the United States Government Survey Expedition; a notice of Herr Mohn's results derived from observations at Novaya Zemlya and Spitzbergen, made by Tobiesen, who died while wintering at the former place; and of Mr. Draper's paper, in which he shows the fears of a supposed change of climate in the Eastern States of North America to be groundless.

SOCIETIES AND ACADEMIES

PARIS

Academy of Sciences, Aug. 24.—M. Bertrand in the chair. The following papers were read:—Ninth note on guano, by M. E Chevreul.—Study of the fossil grain found in a silicified state in the coal formation of Saint-Etienne. Second part: Description of genera, by Ad. Brongniart. The author describes *Polylophospermum*, *Codonospermum*, *Stephanospermum*, and *Ætheotesta*.—Note on the Central Sea of Algeria, by M. E. Roudaire. This is a reply to objections raised by MM. Fuchs and E. Cosson.—Researches on the effects of powder in fire-arms, by M. E. Sarrau.—On the passivity of iron; second note, by M. A. Renard.—Memoir on vegetable protoplasm, by M. Ganeau.—On some phenomena of localisation of mineral substances in the Articulata; physiological consequences of these facts, by M. E. Heckel. The author has been feeding insects with arsenic. The metallic powder was mixed with flour, and after repeated small doses the insects (*Mantis religiosa*, *Blatta occidentalis*, and *Cerambyx heros*) were killed and various parts of the intestinal tube examined. The Malpighian tubes only gave decided indications of arsenic.—Various communications on *Phylloxera vastatrix* were received from MM. Ador, Boutin, Rommier, Morlot, Barnier, and others.—On a new formula for obtaining by successive approximations the roots of an equation of which all the roots are real, by M. Laguerre.—On the direct combination of chromic acid with wool and silk; applications to the colouring and analysis of wines, by M. C. Jacquemin. M. C. Chevreul made some remarks on the foregoing paper.—On the ureides of pyruvic acid and its brominated derivatives, by M. E. Grimaux. Pyruvic acid heated with urea gives a substance of the formula $C_{12}H_{14}N_8O_4$. When excess of urea is employed the compound $C_{10}N_{16}N_8O_7$ is produced. With excess of acid another body is obtained, of which the composition has not yet been established. A nitro-body of the formula $C_{12}H_{10}N_8O_{11}$ has been prepared from these compounds, and likewise a ureide of tribrompyruvic acid of the formula $C_{10}H_8Br_6N_8O_6$.—Analyses of various pieces of calf flesh, mutton, and pork sold in the Paris market in 1873 and 1874, by M. Ch. Mène.—Anæsthesia produced by the injection of chloral into the veins for the removal of a cancerous tumour, by M. Oré.—Application of the graphical method to the determination of the mechanism of rejection in rumination, by M. J. A. Toussaint.—Note on the physiological action of apomorphine, by M. C. David. The author has experimented on dogs, cats, pigeons, rabbits, and guinea-pigs. The influence of various reagents on the alkaloid has also been studied.—Action of the sulphydric acid of the sources of the Luchon on granitic galleries, by M. F. Garrigou.—Observations of the Perseides made at the Observatory of Toulouse on August 5, 7, 8, and 9, 1874, by M. Gruey.—Observations made at Paris of the shooting stars of the month of August 1874; progress of the phemonenon from 1837 to 1874, by M. Chapelas.

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