transparent, brilliant, and of a beautiful pale blue tint. A strong solution of the salt is deep green, a dilute solution blue. When the crystals are moist, they may be considered wetted with the dark green solution, and so their true colour is masked.—On the purification and boiling point of methyl-hexyl carbinol, by E. Neison.—This is followed by a note on the same subject from the pen of Prof. C. Schorlemmer. The two gentlemen agree pretty well with regard to the boiling point, which Mr. Neison finds to be at 181°–182° C., and Prof. Schorlemmer at 179°·5; the difference may probably rest upon the difference of thermometers.—The last paper is on the oxidation of the essential oils, by Chas. T. Kingzett.

Zeitschrift der Oesterreichischen Gesellschaft für Meteorologie, Feb. 1.—Dr. Julius Ucke, of Samara, contributes an abstract of his work, undertaken chiefly from a medical point of view, on the quantitative proportions of atmospheric oxygen in different climates, in relation to temperature, moisture, and density of air. The public have chosen certain localities as health-resorts long before science pointed them out as eligible, and although we cannot doubt that oxygen is a great healing power in these, the part it really plays remains to be determined by physiologists and pathologists. The present work merely opens the way to inquiry, and does not claim to go beyond the evidence of statistics. Samara is a health-resort remarkable for the rarity of diseases of respiration, but its climate is windy and not mild, and the changes of temperature are great, both daily and seasonal. The conditions of temperature, moisture, pressure, and wind, do not account for its healthiness. Two factors remain: oxygen and ozone. Oxygen only concerns us at present. In order to find the relative quantity of oxygen at any place, thermometric, barometric, and hygrometric data are indispensable. Thirteen European and three Indian towns and one American station were chosen. Data for Nice, Algiers, and Madeira were wanting. Bearing in mind the hygienic object of his task, Dr. Ucke takes as a measure of the quantities of oxygen the number of inspirations of a grown man in the course of a month of 30·42 days. In the absence of a normal standard, the mean of the results for the seventeen stations is used for comparison. He finds that in the whole year most oxygen is inspired at Samara, least at Seringapatam; that, taking all stations, the quantities are largest in winter, least in summer, except at Seringapatam, where spring gives the lowest figure. Also, that generally the quantities decrease from E. to W. These differences of course depend on the three factors, temperature, density, and moisture. The first two have by far the most considerable effect. The article is illustrated by various tables.

THE *American Journal of Science and Arts*, March.—The principal papers in this number are: On some phenomena of binocular vision, by Prof. J. Le Conte. The article has reference to the direction of the optic axes in sleep. Arguing from "double sight" in drowsiness, Prof. Le Conti concludes that the axes diverge.—The gigantic cephalopods of the North Atlantic, by A. E. Verrill. This is a continuation of a former article in which he records the dimensions of specimens captured within the last few years.—The trap rocks of the Connecticut Valley, by G. W. Hawes. This contains many analyses of dolerites and diabase.—On the comparison of certain theories of solar structure with observation, by Mr. S. P. Langley. (See following article.)—Notes on Costa Rica Geology, by W. M. Gabb. The area described—the district of Talamanca, consists of granite rocks on which rest beds of Miocene age, the granite being pushed up after the deposition of the Miocene.—Under the head of Scientific Intelligence is a description of a new order of Eocene Mammals, *Tillodontia*, by Prof. O. C. Marsh.—Report of progress of Geological Survey of Pennsylvania for 1874.—Notes on the transit of Venus.

Memorie della Societa degli Spettroscopisti Italiani, January 1875.—Mr. S. P. Langley, director of the Alleghany Observatory, contributes a paper on the comparison of certain theories of the structure of sun-spots with observation. He alludes to the so-called "crystalline" forms seen at times in the umbræ of spots, and to their lending confirmation to the views of those who regard the photosphere as a luminous covering of incandescent fluid, and the spots cooling matter in it. The author says that they are at first sight so confirmatory of this view that it was only after long study he had been led to think them assimilable to certain cloud forms in our atmosphere. A beautifully executed steel engraving accompanies the paper, showing the forms alluded to over the umbra of a spot; and they certainly put one in mind of certain forms of cirrus cloud. All the filaments of the penumbra are directed generally towards the centre of the spot; but while all are more or less curved, there is no common direction of curvature. Mr. Langley also remarks that the ends of the filaments are generally the brightest parts, and that it is difficult to resist the impression that they turn upwards at the extremities and appear as though lifting their points through some obscuring medium. One of the crystalline forms appears in great beauty on the spot. It is about 20″ long, and 10″ wide, and has the appearance of a plume or of finely carded wool: and the author asks if we are prepared to admit the existence of a body analogous to a crystal covering ten times the area of Europe. He also refers to sudden and abrupt changes in the direction of the filaments, apparently being due to the passage of one cloud stratum over another, and he remarks this disposition elsewhere in the spot giving a terraced appearance. He says: "It seems difficult to reconcile the bright, sharply-defined inner edge and the regular structure discerned in the umbra, with another view in which this umbra is a sort of stagnant pool formed by cold vapours or clouds which have settled there after depressing the general surface by their weight until the penumbral slope is determined;" and "The theory which regards cyclonic or vertical action as a prominent agent in determining the forms we have studied appears to be in closer accordance with observation than the former."—Father Secchi, in a note on the foregoing paper, remarks that at the edge of the sun, where the spot in question disappeared, there was seen an active prominence, and his further remarks are to be continued in the next number.—P. Tacchini contributes a paper on the condition of Italian and other observatories, giving the staff at each and their salaries. We extract the total payments to the staff and for instruments at the following Observatories:—

	Lire.		Lire.
Paris	54,000	Rome	4,920
Greenwich	75,000	Padua	6,200
Pulkowa	220,000	Modena	4,940
Palermo	7,800	Turin	4,700
Naples	13,248	Bologna	4,500
Florence	6,700	Parma	1,300
Milan	14,802		

SOCIETIES AND ACADEMIES

LONDON

Royal Society, April 15.—"Researches upon the Specific Volumes of Liquids," by T. E. Thorpe. Communicated by Prof. Williamson, For. Sec. R.S.

I. *On the Atomic Value of Phosphorus.*

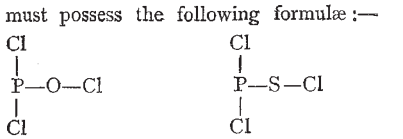
Hermann Kopp has shown that, as a rule, the specific volume of an element is invariable when in combination. Exceptions to the law occur, however, in the cases of oxygen and sulphur, each of which bodies has two specific volumes dependent upon the manner in which they are held in union. When contained "within the radicle," as in acetyl, C_2H_3O, oxygen has the value 12·2, but when existing "within the radicle," as in alcohol, it has the smaller value, 7·8. Sulphur, when "within the radicle," has the specific volume 28·6; when "without the radicle," it has the specific volume 22·6.

The cause of these variations may be thus stated in the language of modern theory:—When dyad sulphur and oxygen are united to an element by both their affinities, their specific volumes becomes respectively 28·6 and 12·2; when they are attached by only one combining unit, their specific volumes are 22·6 and 7·8.

Phosphorus is regarded by certain chemists as invariably a triad; others maintain that it is sometimes a triad, at other times a pentad. In the trichloride it is a triad, in the oxychloride and thiochloride it is a pentad. According to this view the two latter compounds possess the following constitution:—

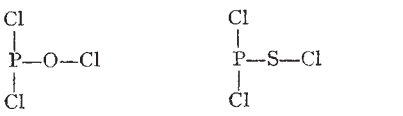
If, however, phosphorus is invariably trivalent, the oxychloride

and thiochloride must possess the following formulæ :—



It is possible to decide between the two modes of representing the constitution of these compounds, if it be granted that the variation in the specific volume of oxygen and sulphur is due to the manner in which these elements are held in union. For if the phosphorus in the oxychloride and thiochloride be quinquivalent, the oxygen and sulphur must possess the greater of the two values, since both their combining units are united to the phosphorus ; if, on the other hand, phosphorus be trivalent, the oxygen and sulphur must possess the smaller of the two values.

The author has determined the specific gravity, boiling-point, and rate of expansion of PCl_3, $POCl_3$, and $PSCl_3$, in order to ascertain the specific volume of the oxygen and snlphur in the two latter compounds, and consequently the chemical value of the phosphorus ; and he finds that the specific volumes of the oxygen and sulphur are almost identical with the values given by Kopp for these elements when "without the radicle." It would therefore appear that the oxychloride and thiochloride must possess the constitution—



and that the phosphorus in these bodies is to be regarded as a triad.

The author concludes by discussing Buff's hypothesis that the specific volume of an element varies with its chemical value ; and he shows that in the case of phosphorus there are no reasons for the belief that this element has a variable specific volume.

Geological Society, April 14.—Mr. John Evans, V.P.R.S., president, in the chair.—Descriptions of new corals from the Carboniferous Limestone of Scotland, by Mr. James Thomson. In this paper the author described some forms of corals from the carboniferous limestone of Scotland, which he regards as new species, and as belonging to three new genera allied to *Clisiophyllum*. In the group which he names *Rhodophyllum* the calice is circular and shallow, the epitheca thin and smooth, the septa thin and numerous, and the columellar boss dome-shaped, slightly raised above the inner margin of the primary septa, and clasped by subconvolute ridges. The species referred to this genus are *Rhodophyllum Craigianum*, *R. Slimonianum*, *R. Phillipsianum*, *R. Argylianum*, *R. reticulatum*, and *R. ellipticum*. *Aspidiophyllum* has the calice generally circular, shallow ; the septa forming thin laminæ for about half their length from within, when they become flexuous, and the columellar boss prominent and helmet-shaped. The species are named *A. Koninckianum*, *A. Huxleyanum*, *A. cruciforme*, *A. elegans*, *A. Hennedii*, *A. Danai*, *A. dendrophyllum*, *A. ellipticum*, *A. Pagei*, *A. scoticum*, and *A. laxum*. The third genus, *Kurnatiophyllum*, is most nearly allied to *Rhodophyllum*, but has the columellar space slightly raised above the inner margin of the primary septa, and crowned by bending or wavy lamellæ, some of which pass over the central space in sinuous folds. The species are described under the names of *R. concentricum*, *clavatum*, *Tyleranum*, *intermedium*, *ellipticum*, *Ramsayanum*, *Youngianum*, *Harknessianum*, *lamellifolium*, *bipartitum*, *octolamellosum*, *Haimanum*, *Edwardsianum*, and *Davidsonianum*. In a specimen of *Aspidiophyllum Huxleyanum* the author noticed in the open interseptal space a small tube, four lines long, around the inner margin of which there was a group of oval bodies, which, from their close proximity to the inner margin of the primary septa and their form, he is inclined to think may be ova.—On the probable existence of a considerable fault in the lias near Rugby, and of a new outlier of the oolite, by Mr. J. M. Wilson. The author called attention to what appeared to him to be a great fault in the Lower Lias at the village of Low Morton, near Rugby, where a sandpit is worked against the face of a steep hill to a depth of nearly fifty feet. The sand in the valley, as proved by wells and borings, is of great depth. Above the sand-pit is a clay-pit, and the author stated that the clay is bounded towards the sand by a highly inclined face of clay, against which the sand is thrown. This face of clay can be clearly traced for a distance of more than half a mile, running in a south-easterly and north-westerly direction. If continued to the south-east, it would pass close by Kilsby Tunnel, the difficulties met with in the construction of which may have been due in part to a continuation of the fault ; whilst if continued to the north-west it would coincide generally with the valley of the Clifton Brook, the bed of which is also occupied by a great depth of sand. The line of fault thus passes between Rugby and Brownsover, and the author suggests that it is the cause of the presence on the summit of the Brownsover plateau of an extensive oolitic mass of Stonesfield-slate character. The line of fault continued further would connect with the Atherstone and Nuneaton fault, and agree with this in having its downthrow on the north-east side.—On a Labyrinthodont from the Coal-measures, by Mr. J. M. Wilson. The fossil referred to in this paper was from the Leinster Coal-measures, and was regarded as probably belonging to the genus *Keraterpeton* of Prof. Huxley, although the outer posterior angles of the skull do not appear to have been prolonged into cornua.—On *Cruziana semiplicata*, by Mr. J. L. Tupper ; communicated by Mr. J. M. Wilson. In this paper the author gave a detailed description of a slab of unknown origin, but said to have been obtained from a workman at Bangor, containing several specimens of the fossil described by Salter under the name of *Cruziana semiplicata*. From his examination of the specimen the author seemed inclined to ascribe to *Cruziana* an animal origin, and to regard it rather as fossilised animal structure than as a cast of the track left by the feet of some animal passing over the surface of the sand.

Geologists' Association, April 2.—Mr. Wm. Carruthers, F.R.S., president, in the chair.—Remarks upon geological boundary lines, by Horace B. Woodward, F.G.S. The author believes a tendency exists to overlook the broad classification of lithological characters, and to adopt lines of a palæontological nature. The identity of organic remains is no absolute proof of contemporaneity. In identifying the age of a formation the test of superposition, as a rule, is decisive ; and the main facts of palæontology must first be worked out from the stratigraphical succession of the rocks. Still the value of palæontology cannot be disputed, and if we cannot identify formations far separated as synchronous when the fossils are similar, we may parallel successive faunas. Our formations, when looked at in the large way, must be taken to represent deposits of essentially similar character, and characterised by a particular assemblage of fossils. The more we learn of the history of our own strata and those of foreign countries, the less evidence do we see of breaks in the conformity of succession.—Notes on the probable depth of the Gault sea ; or, an endeavour to ascertain the relative depth of the sea during the Gault period, by comparing the representative fossil genera with recent forms, by F. G. H. Price, F.G.S. The author is disposed to consider that the depth of the sea in which the Lower Gault was deposited did not exceed 100 fathoms.

Meteorological Society, April 21.—Dr. R. J. Mann, president, in the chair.—Mr. Scott read a paper, "Notes on sea temperature observations on the coasts of the British Islands." He said that it mainly related to the connection between sea temperature and the take of fish on the coasts, and he noticed the investigations formerly carried on by the Dutch and that now in progress under the direction of the Scottish Meteorological Society. He read a letter from Mr. F. Buckland on the subject, which, however, proposed a scheme of action which would entail heavy expenditure, while at present there was no satisfactory record kept of the take of fish on any of our coasts except those of Scotland. Mr. Scott then said that he had had some observations of sea temperature taken at some stations in the West of England and on the coasts of the Irish Sea, and had received some observations from Mr. W. Dymond and from Mr. N. Whitley, and he submitted some monthly mean temperatures from a few stations. He also stated that both the Trinity House and the Commissioners of Irish Lights had kindly consented to have observations taken at certain lightships, and that instruments had been supplied for the purpose, and the inquiry was in progress. In conclusion, he mentioned the steps taken by the German Government to investigate the temperature, &c., of the sea on their Baltic and North Sea coasts, and expressed a hope that our Government would undertake a similar inquiry.—Mr. Pastorelli read a paper on the errors of low range thermometers. He pointed out some of the difficulties which instrument-makers have to encounter in graduating thermometers from 32°·0 to −37°·9, the freezing point of mercury, as there is no intermediate fixed point. He believed that fairly accurate thermometers could only be obtained by calibration.—

Mons. Louis Redier exhibited his new barograph, which was explained to the meeting by Mr. Symons.—Mr. Scott also exhibited Prof. Wild's pressure anemometer.

Physical Society, April 24.—W. Spottiswoode, F.R.S., in the chair.—Mr. J. Barrett exhibited an "auxiliary air-pump;" it is a modification of Poggendorff's arrangement for obtaining a Torricellian vacuum, and is allied in principle to the exhauster used by Geissler in the preparation of vacuum tubes.—Mr. Barrett also showed a hammer break for the instantaneous rupture of the current in the primary wire of an induction coil. It is impossible to explain it clearly without a diagram, but an upright swing hammer is kept constantly vibrating by the alternate action of a spring and the magnetised core.—Dr. W. H. Stone read a paper "On some points connected with wind instruments." He stated that discrepancies might be noted in the behaviour of air issuing from the side orifices of wind instruments. These discrepancies deserve attention, and may be accounted for by the laws of efflux. He showed that the stream of air from the side hole of a clarionet was sufficient to extinguish a candle, though the musical vibration was obviously in the main tube. It is usual to tune such instruments by introducing a resinous cement into the holes so as to diminish their calibre, but after a certain point is reached the rounded surface thus obtained ceases to produce an effect. If a short pipe of the same diameter as the orifice be now inserted, auxiliary vibrations are set up, and a definite note may be produced.. Dr. Stone was led to inquire whether the theorem of D. Bernoulli, or the particular part of it named after Toricelli, could be brought to bear on the question. The *vena contracta*, which in fluids reduces the efflux to 0·62 of the calculated amount, is also to be noticed in gases, and the nature of the effluent column of air is affected by three conditions: 1. The thickness of the wall in which the orifice is made. 2. The shape of the nozzle. 3. Friction in a long pipe. Some mathematical details were then given respecting these conditions, and it was admitted that the vibration in a musical tube must also exercise sensible influence. There are two functions in a side orifice in an instrument; the first is to cut off a portion of the tube, and by this means to raise the pitch; the second establishes a point of non-resistance in the wall of the tube, and thus acts by influencing the longitudinal vibrations. In the organ peculiar qualities of tone are often obtained by these side holes, as in the "Viol di Gamba" and "keraulophon" stops. In flutes, oboes, clarionets, and other instruments, much of the tone comes from the bell, even when the side holes are open. In instruments in which the holes are long, as in the bassoon, the holes themselves became separate vibrating tubes. This was shown by introducing tubes of different and increasing lengths, into an orifice in the side of an organ reed pipe. The friction at last became so great, and the secondary wave so strong, that the organ-pipe returned to its original pitch. A reed was also applied to a cylindrical tube, and it was shown that a sharp-edged orifice opened at the middle point of the tube rendered it impossible to produce any note until a cylindrical nozzle was introduced, when the octave was sounded freely. The general results proved that lateral holes had a double function, the pitch of the notes emitted varying with their size, shape, and length, the actual severing of continuity in the principal tube being a comparatively minor point. Dr. Stone then inserted three tubes varying in length from two to six inches in a cylindrical tube like that of a clarionet, at right angles to its length, the longest being placed at the the centre of the instrument, and the shortest at one-eighth from the mouthpiece. The same note was produced when each tube was used singly and when the three were employed, and Dr. Stone expressed a hope that a series of experiments would render it possible to develop curves in which the co-ordinates would be the lengths of the additional tubes and their position in the instrument. He also considered that a new instrument might be produced in which the side orifices acted purely as nodal points by the assistance of friction and the contracted vein.

Anthropological Institute, April 13.—Col. A. Lane Fox, president, in the chair.—A paper, largely illustrated by diagrams, was read by Prof. Rolleston, F.R.S., "On the people of the Long Barrow period." The author discussed at great length the following points:—1. The evidence existing for dividing the Long Barrow period into three epochs. In the earliest one the dead were interred unburnt in chambers, *i.e.* in graves walled with upright flags and communicating with the exterior by a passage or gallery, or at any rate constructed so as to admit of successive interments. In those chambers was found the greatest amount of manganous discoloration. In the second period the dead were still interred unburnt, but in cists, *i.e.* in closed stone receptacles not intended to be re-opened, and having no gallery leading to the exterior. The third epoch of the Long Barrow period was distinguished, to the great regret of the craniographer, by the practice of cremation, a practice which, like that of burial in cists, and with even more probability, might be supposed to link the Long and Broad Barrow periods together. 2. The evidence for accepting what might be called the Ossuary theory for explaining the appearances met with in the Long Barrows, rather than the theory of successive interments as put forward by Prof. Nilsson, or the theory of human sacrifices and anthropophagy as suggested by the late Dr. Thurnam. What inclined Prof. Rolleston to the Ossuary theory was the fact that just those bones are found in connection most frequently which would, by virtue of their ligamentous or muscular connections, longest resist the dislocating effects of removal from a provisional to a permanent burial-place. 3. The evidence as to the mode of life prevalent in the Long Barrow period which the cranial and other bones of the persons buried or burnt in them furnished. Mr. Bertram F. Hartshorne exhibited and described objects of Pre-Hellenic age from Troy.

BERLIN

German Chemical Society, March 22.—F. Gäss and C. Hell have observed a condensation of amylic aldehyde through the agency of carbonate of potash resulting in the formation of a body $C_{10}H_{18}O_2$.—C. Hempel has found amongst the products of oxidation of terpin a new monobasic acid, $C_8H_{12}O_4$, homologous with terebinic acid.—E. Prehn found that hydrochloric acid transforms mesaconic into citraconic acid.—E. Büchner, in distilling paramonobromaniline, has observed its transformation into aniline, dibromaniline, and tribromaniline.—R. Fittig and R. Mayer, continuing their communications on isomerism in the aromatic series, insist upon the transformation of all three bromophenols into mixtures of resorcin and pyrocatechin, a fact singularly affecting theoretical conclusions hitherto drawn from single experiments.—A. Schrohe observed allylene-sulphuric acid to yield not only mesitylene, but also acetone, by the action of water.—W. Lossen sent a short note on the reduction of metallic oxides by hydroxylamine, which is thereby transformed into N and H_2O.—C. Gosslich asserts that he has discovered a fourth isomeric bromobenzene-sulphonic acid.—H. Limpricht recommended measures of precaution to be taken in the determination of the solubility of salts.—D. M'Creath described substituted guanidines obtained through the action of anhydrides on guanidines, viz., benzoyl-triphenyl-guanidine, diacetyl-triphenyl-guanidine, and dibenzoyl-diphenyl-guanidine.—T. Jannasch has been able to transform bromomesitylene, $C_6H_2Br(CH_3)_3$, into tetramethylbenzene, a liquid isomeric with durene.—C. Liebermann and H. Troschke have studied the action of ammonia on alizarine. The products are compounds in which OH is replaced by NH_2, and 2OH are replaced by NH.—C. Liebermann and F. Palm exhibited crystalline compounds of hydrocarbons with the chloride and with the amide of picric acid.

April 12.—O. Brenken has studied what was generally considered as the melting of terchloride of iodine, and has found it to consist of a dissociation into monochloride and free chlorine.—P. Melikoff determined that at 77° ICl_3 is completely decomposed into ICl and Cl_2.—A. Michaelis and J. Ananoff, in treating $PCl_2.C_6H_5$ with zinc ethyl, have obtained diethyl-phenyl-phosphine, a liquid base, distilling at 222°, taking up 2HCl and 2Cl. Oxide of silver, exchanging O against Cl_2, produces an oxide with the latter body. $PC_6H_5(C_2H_5)_3I$ is a well-crystallised compound. Similar bodies have been obtained by the action of zinc methyl on phosphenyl-chloride.—A. Michaelis, by treating $PCl_2C_6H_5$ with PH_2 and water or alcohol, obtained a yellow powder of the formula $C_6H_5 - P = P - OH$, diphosphobenzol corresponding to a diazobenzol.—E. Benzinger, heating phosphenylic acid, $C_6H_5PO(OH)_2$ with nitric acid in sealed tubes, has obtained a crystalline mononitrophosphenylic acid, which with tin and hydrochloric acid yields the corresponding amido-acid.—H. Lange, in passing toluene and PCl_3 through a red-hot tube, was unable to produce phosphobenzyl-chloride, but obtained stilbene only.—A. Michaelis, who has lately expressed the constitution of phosphorus acid thus: $HPO(OH)_2$, defends his view against a paper lately published by Zimmermann.—F. Kammerer has fixed the melting-point of perchloride of antimony as − 6° C.—H. Köhler and B. Aronheim have treated iodide of isopropyl and

chloride of benzyl with sodium, thus obtaining $(CH_3)_2CH.CH_2C_6H_5$, phenyl-isobutan.—H. Hübner proved that benzoic acid can liberate nitrobenzoic acid from nitrobenzoate of barium, although the latter is the stronger acid of the two. The experiment consisted in heating the solutions to 80°.—H. Hübner and C. Rudolf have obtained an ethenyl-phenylenediamine, $C_6H_4\overset{NH}{\underset{N}{\diagdown\!\!\diagup}}C.CH_3$, by treating orthonitroacetanilide with tin and glacial acetic acid.—O. Billeter has transformed sulphocyanate of phenyl into the sulphide by treating it with sodium-amalgam. Lead allyl sulphydrate and chloride of cyanogen have yielded allyl sulphocyanate to the same chemist; it is converted into the isomeric mustard-oil on distillation.—H. Limpricht communicated researches on derivatives of the three amidosulphobenzolic acids.—W. Weith, by heating chloride of ammonium with methylic alcohol to 280° for ten hours, has transformed it completely into trimethylamine and tetramethylammonium-chloride.

April 26.—Researches were read by A. Burghardt, on bibromobenzoic acid; by H. Glassner, on paraiodosulphotoluene, $C_6H_3.CH_3.I.SO_3H$; by T. Ebell, on nitrobenzonaphthylamide, $C_{10}H_6.NO_2.NH.CO.C_6H_5$, which was found to combine with iodide of amyl; by F. Meinecke, on derivatives of benzanilide; by E. A. Grete, on derivatives of metabromotoluene.—H. Hübner defended modern chemistry against attacks launched against it by Prof. Kolbe, and showed the insufficiency of the proofs hitherto furnished for the existence of four nitrobenzoic acids, four bihydrobenzene, and four bromobenzene-sulphonic acids. These doubtful cases of isomerism, which, if true, would be opposed to Kekulé's benzene theory, were also vigorously attacked by experiments published by A. Ladenburg, as well as by P. Griess and by E. Nölting. The constitution of benzene derivatives, viz., $C_6H_4Br.CH_3$ and $C_6H_3Br.NO_2.CH_3$, also formed the subject of a communication by E. Wroblewsky.—Mr. P. Siljeström defended his opinion on the density of gases under diminished pressure against that expressed by Mr. Mendelejeff.—A. Stutzer has tried the action of nitric acid on the fibre of grasses, and not finding benzene derivatives amongst the products, concludes that the fibre does not contain aromatic bodies preformed.—Dr. Ewald described an improved method for determining urea with hypobromite of sodium by ordinary volumetric analysis.—V. Mering reported on the action of digestion on sarcosine, arriving at the conclusion that urea and uric acid are *not* diminished in quantity in the urine of individuals fed with sarcosine. This is contrary to the observation published by Schultzen some years ago.—E. Fischer, in reducing a diazo-compound, $C_6H_5-N=N-NO_3$, with bisulphite of sodium, and treating the resulting compound, $C_6H_5-NH-NH.SO_3K$, with chloride of benzoyl, obtained the first of a new class of bodies:

$$C_6H_5-NH-N(CO.C_6H_5)_2$$

that is, an ammonia, NH_3, in which one H is replaced by an amido-group, NH_2. He calls this class of bodies *hydrazines*; the body whose formula is given above is dibenzoylated phenylhydrazine. By the action of water and hydrochloric acid it yields benzoic acid and a base, phenyl-hydrazine, $C_6H_5-NH-NH_2$, which forms well-defined crystalline salts with HCl, &c.

PARIS

Academy of Sciences, April 26.—M. M. Frémy in the chair.—The following papers were read:—On ascents to great heights, by M. Faye. M. Faye advocates strongly that the Academy should forbid any balloon ascent beyond 7,000 metres of elevation; he considers that any observations that might be made beyond that point will not be of any greater value than those up to that limit, and will certainly not outweigh the danger to life. He thinks that all aëronauts will respect the Academy's decision.—On the determination of ordinary alcohol when mixed with methylic alcohol, by M. Berthelot.—A note by M. A. Ledieu, on thermo-dynamical machines.—A note by M. Marès, on the results of the experiments made by the Commission investigating the diseases of vines in the Hérault.—A note by M. Dumas, on the use of alkaline sulphocarbonates against Phylloxera.—A note by M. F. de Lesseps, on the methods to be employed for the maintenance of ports.—A note by M. L. Saltel, on the geometrical principle of correspondence of M. Chasles.—On the curves of the order n with a multiple point of the order $n-1$, by M. B. Niewenglowski.—On the development of the perturbating function according to the multiples of an elliptical integral, by M. H. Gylden.—On binauricular perceptions, by M. F. P. Le Roux.—On the determination of methylic alcohol in the presence of vinic alcohol, by MM. Alf. Riche and Ch. Bardy.—On the spiroscope, an apparatus for the study of auscultation, of the anatomy and physiology of the lungs, by M. Woillez.—A note by MM. G. Hayem and A. Nachet, on a new method of counting the blood-corpuscles.—On the wine-growing districts attacked by Phylloxera in 1874, by M. Duclaux.—M. Dumas then announced to the Academy the loss which science has sustained by the death of M. Anton. Schrötter, secretary to the Academy of Sciences at Vienna.—On the precipitation of silver by protoxide of uranium, by M. Isambert.—On the action of platinum and palladium upon the hydrocarbons of the benzenic series, by M. J. J. Coquillion.—A note by M. Peslin, on the law of diurnal and annual variations in the temperature of the soil.—On the theory of storms, by M. Constié.—A note by M. U. Gayon in reply to M. Béchamp's paper on the spontaneous alterations in eggs.—On the helminthological fauna of the coasts of Brittany, by M. A. Villot.—On a new intermediary type of worms (*Polygordius?* Schneider), by M. Edm. Perrier.—On the ornamentation of striated wood-fibres and their relation to ordinary spotted fibres in the wood of certain species of Conifera, by M. G. de Saporta.—On the glacier deposits of the inferior valley of the Tech, by M. E. Trutat.—On the differences in the rising and setting of Mercury, Venus, Mars, Jupiter, and Saturn, as stated in the *Journal du Ciel* and in the *Annuaire du Bureau des Longitudes*, by M. J. Vinot.—On a method of re-establishing the concordance of the solar with the civil year, by M. Crampel.

BOOKS AND PAMPHLETS RECEIVED

BRITISH.—A Manual of Diet in Health and Disease: T. King Chambers, M.D., F.R.C.P., &c. (Smith and Elder).—The Journal of the Iron and Steel Institute, 1874 (E. and F. N. Spon).—Electricity; its Theory, Sources, and Applications: John T. Sprague (E. and F. N. Spon).—Researches in Chemical Optics: John H. Jellett, B.D. (Dublin University Press).—Journal of Proceedings of Winchester and Hampshire Scientific and Literary Society. Vol. i. Part iv. 1874 (Winchester, Warren and Son).—Meteorology of West Cornwall and Scilly, 1870 to 1874, and Observations on Sea Temperature, 1872 to 1874: W. P. Dymond, F.M.S. (Falmouth, Wm. Tregaskis).—An Address delivered by the President of the Meteorological Society at the Annual Meeting, January 20, 1875.—Journal of the Quekett Microscopical Club (R. Hardwicke).—Perthshire Society of Natural Science. Sixth Annual Report.—On Protoplasm: James Ross, M.D. (R. Hardwicke).—Commercial Handbook of Chemical Analysis, by A. Normandy; Enlarged and to a great extent re-written by H. M. Noad, Ph.D., F.R.S. (Lockwood and Co.)—Life of Sir Roderick Murchison, Bart., K.C.B., F.R.S.: Archibald Geikie, LL.D., F.R.S. (John Murray).—New Code Progressive Reader. Fifth Standard (Wm. Collins, Sons, and Co.)—Unseen Universe (Macmillan and Co.)—Year Book of Facts in Science and the Arts. Edited by Chas. W. Vincent, F.R.S.C. (Ward, Lock, and Tyler).—Thirteenth Annual Report of the Free Librarians' Committee (Birmingham, Hall and English).—Text-Book of Botany, Morphological and Physiological. By Julius Sachs; translated by Alfred W. Bennett, M.A., B.Sc., F.L.S., assisted by W. T. Thiselton Dyer, M.A., B.Sc., F.L.S. (Oxford, Clarendon Press).—Report of the Permanent Committee of the First International Meteorological Congress at Vienna, 1874 (H.M. Stationery Office).—Climate and Time: James Croll (Daldy, Isbister, and Co.)—Fiji: Our New Province in the South Seas: J. H. de Ricci, F.R G.S. (E. Stanford).—Journal of the Anthropological Society of Great Britain and Ireland, April to July 1874 (Trübner and Co)—An Elementary Book on Heat: J. E. Gordon, B.A. (Macmillan and Co.)

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