that continuous electrophoroi furnish, when carefully examined, a clear proof that induced electricity does not possess any tension. In fact, in the case of these machines, as in that of frictional machines, the conducting spikes of the prime conductor possess the two opposite electricities co-existent on the same points; this is easily shown by means of a very small proof-plane.[1]

Thirteenth Experiment.—It is shown, by means of Geissler's tubes submitted to the electrical influence, that induced electricity of the first kind has no tension.[2]

Fourteenth Experiment.—Here it is observed that the proof-plane, whether submitted or not to electrical induction, always receives by contact a charge greater than that which is free on the element which it has touched. Then the *coïbent*, always indispensable in the construction of the proof-plane, receives, by infiltration, a certain quantity of electricity, besides that obtained by communication with the metallic part. This infiltration or absorption varies not only with the nature of the *coïbent*, but also with its quantity, within certain limits. This communication [3] contains other observations on electrical induction, and it is concluded that on the extremity of the induced body nearest to the inductor, the two opposite electricities coexist, and that consequently induced electricity of the first kind has no tension. It is also concluded that the homonym of the inductor is always found on whatever point of the induced body this may be, and that the homonym indicated is the only one to be dissipated, because it alone is the only one endowed with tension.

Fifteenth Experiment.—In this is explained Nicholson's duplicator, which is satisfactory, since it is based on the want of tension in induced electricity of the first kind.[4]

Sixteenth Experiment.—In this is shown how we may shield from curvilinear induction the electroscope which hangs from the extremity of the induced body nearest to the inductor. From this experiment it is concluded that the divergence of the straws is due principally to curvilinear induction, and that induced electricity of the first kind does not possess tension.[5]

Seventeenth Experiment.—In this is analysed a little known electrostatic phenomenon; and from this analysis it follows that induced electricity of the first kind has no tension.[6]

Eighteenth Experiment.—It is shown mathematically that electric induction does not traverse conducting masses. It is afterwards observed that first the Florentine academicians and then Faraday admitted this truth. It is also observed that if we admit that induced electricity of the first kind possesses no tension, we arrive at the conclusion given below by means of experiment.[7]

CONCLUSION.—Upon an insulated conductor submitted to the electric influence—1. Induced electricity of the first kind does not possess tension. 2. It is found in greater quantity at the extremity of the induced body nearest to the inductor, and diminishes always as it approaches the other extremity. 3. Induced electricity of the second kind, *i.e.*, the homonym of the inductor, is found on every point of the induced body, not excepting the extremity nearest to the inductor; it continually increases in proportion as it approaches nearer to the other extremity, and is always free.

SCIENTIFIC SERIALS

Mind—A Quarterly Review of Psychology and Philosophy. Edited by George Croom Robertson, M.A., Professor of Philosophy of Mind and Logic, in University College, London. Jan. 1876.—*Revue Philosophique de la France et de l'Etranger.* Dirigée par Th. Ribot. Première Année. Janvier 1876: Paris.—The growing importance of psychology has been asserted by the simultaneous appearance of a French and an English review, especially devoted to its interest. In scope and character the two publications are identical. One aim of the projectors of *Mind* seems to be to obtain a decision of the question: Is psychology a science? "Nothing less, in fact, is aimed at in the publication of *Mind*." The first number opens with a lecture on "The Comparative Psychology of Man," read before the Anthropological Institute, by Mr. Herbert Spencer. It is one mass of valuable suggestions, and every reader will follow with interest the divisions and sub-divisions under which Mr. Spencer recommends that the subject should be studied.—Next follows under the title "Physiological Psychology in Germany," a rather lengthy account, by Mr. James Sully, of a work by Prof. Wundt of Leipzig. The other leading articles are in their order:—"Consistency and Real Inference," by Mr. John Venn; in which the comparative merits and defects of the conceptualist and material views of logic are considered. Towards the end of the article Mr. Venn refers to what he calls an irrelevant difficulty which sometimes puzzles the student of Mill. How, asks the student, can Mr. Mill, while professing to be an idealist, lay it down that logic has to do with the facts or things themselves, rather than with our ideas about them? We do not see that the consistency of Mr. Mill would be very conclusively vindicated even were it the fact that he did not allow his idealism to interfere with his logic more than does an idealistic astronomer allow his metaphysics to affect his astronomy. But does not Mr. Mill fall back on his idealism when in his discussion with Mr. Herbert Spencer as to the number of terms in the syllogism, he maintains that the things named in the premises and conclusion of a syllogism are our sensations or expectations of sensations, while Mr. Spencer holds the things spoken of to be so many separate objective entities? In an able and interesting paper, Mr. Henry Sidgwick discusses "The Theory of Evolution in its Application to Practice," and finds that when guidance is needed in ethics or politics the doctrine of evolution will not help us. A distinction between "Philosophy and Science," is next worked out by Mr. Shadworth H. Hodgson, in which he displays all his remarkable delicacy of thought. He finds the peculiar scope of philosophy to be "ultimate subjective analysis of the notions which to science are themselves ultimate." We doubt if Mr. Lewes would admit that this is not included in his conception of philosophy as embodied in the really great work on which he is now engaged. An excellent article on "Philosophy at Oxford," is contributed by the Rector of Lincoln College, which it is perhaps not too much to hope may bear some practical fruit. Coming last and occupying the place of the novel in the magazine, is "The Early Life of James Mill," to be continued, by Prof. Bain. In addition to being of intense interest to all who care for mental science, it has been eagerly read and discussed by many who have read nothing else in *Mind*. Short Critical Notices and Reports, and neat little Notes by the editor and others, complete the volume. We sincerely hope Prof. Robertson will be able to keep the *Review* up to the standard of this first number. To make it a commercial success will not be an easy task, for though philosophy has of late been a marketable commodity, that has been when distributed among many periodicals.

Of the *Revue Philosophique* we can say only a very few words. The first number opens with a most interesting and suggestive account, by M. Taine, of observations he made on the acquisition of language by a female child. His speculations about words entirely invented by the child and carrying with them natural meanings, as also his reasonings from the childhood of the individual to that of the race, are ingenious and plausible. He concludes with some excellent remarks on Max Müller's view that in *rational* language we find the distinctive characteristic of man. According to M. Taine the use of words, sounds carrying with them a vague general connotation, is, like the use of ornaments and the use of tools, in common with numerous other indications, an evidence that the stage human has been reached. The psychological condition of this superiority, he continues, will be found in a greater aptitude for general ideas, and its physiological condition in a larger and finer development of brain. In the second article the doctrine of final causes is ably discussed by M. P. Janet, from various points of view. He concludes, however, by maintaining a form of the doctrine, which, as far as we can see, without being able to serve any practical end, supposes a theory that lies wholly outside the boundaries of science. Mr. Herbert Spencer's lecture on "The Comparative Psychology of Man," of which we have already spoken, comes next. The remainder of the number is taken up with reviews of books.

THE *Journal of the Chemical Society* for February contains the following papers:—On the presence of liquid carbon dioxide in mineral cavities, by W. N. Hartley. The author's researches have been chiefly confined to quartz, evidence of the nature of the enclosed liquid being furnished by the specific gravity of the liquid as compared with water (which was also contained in the cavities), and by observing the critical temperature. The author is of opinion that the fluid-cavities of sapphires and rubies also contain carbon dioxide.—On certain bismuth compounds, by

1 "Comptes Rendus," t. 67, p. 843 (Oct. 26, 1868).
2 Ibid., t. 69, p. 730 (Sept. 27, 1869).
3 Ibid., t. 74, p. 860 (March 25, 1872).
4 Ibid., t. 75, p. 257 (July 29, 1872).
5 Ibid., t. 76, p. 169 (Jan. 20, 1873)
6 Ibid., t. 76, p. 1296 (May 26, 1873).
7 Ibid., t. 78, p. 901 (March 30, 1874)

M. M. Pattison Muir. The author has examined the trichloride, tribromide, and the so-called bismuthic acid.—On bismuthiferous tesseral pyrites, by W. Ramsay. The formula of this mineral appears to be $(Ni, Co, Fe)(As, Bi)_3$.—On the occurrence of native calcium chloride at Guy's Cliffe, Warwickshire, by John Spiller.—The decomposition of alcohol and its homologues by the joint action of aluminium and its halogen compounds, by Dr. J. H. Gladstone and Alfred Tribe. Aluminium and its iodide have no action upon methyl alcohol. Ethyl alcohol is energetically decomposed by a mixture of these substances, hydrogen gas being evolved in large quantities and a pasty residue being left, which the authors consider to be aluminic iodo-ethylate. Heated to 275° C. this residue fuses and undergoes decomposition thus :—

$$Al_2 \left\{ \begin{matrix} (C_2H_5O)_3 \\ I_3 \end{matrix} \right. = Al_2O_3 + 3 \left\{ \begin{matrix} C_2H_5 \\ I \end{matrix} \right.$$

The authors have likewise obtained evidence of the existence of aluminic ethylate. Amylic alcohol is decomposed also by these substances. A mixture of the chloride with the metal has no action upon alcohol; the bromide has a decided action.—Ethyl-phenyl-acetylene, by T. M. Morgan. This substance has been obtained by the action of ethyl iodide upon the sodium compound of phenyl-acetylene the two substances being mixed with ether and heated in sealed tubes.—Narcotine, cotarnine, and hydrocotarnine, by G. H. Beckett and Dr. C. R. A. Wright. The authors have studied the action of water upon narcotine hydrochloride, the action of ethyl iodide on hydrocotarnine, narcotine, and cotarnine, and the action of acetic anhydride on all three of these bodies. Dr. Wright adds an appendix on the structural formulæ of narcotine and its derivatives.—Note on incense resin, by Dr. J. Stenhouse and C. E. Groves. This resin is the produce of *Icica heptaphylla*, Aubl., a native of British Guiana. The essential oil contains a hydrocarbon of the empirical formula C_5H_8, which the authors propose to call conimene. To the crystalline resin the authors assign the formula $C_{46}H_{76}O$, and propose the name *icacin*.—On certain sources of error in the ultimate analysis of organic substances containing nitrogen, by G. S. Johnson. These errors are: first, increase of weight by the absorption of oxygen by *nitrite* contained in the solution in the potash bulb owing to the passage of unreduced nitrous anhydride over the ignited copper. Secondly, the presence of occluded hydrogen in the metallic copper reduced in this gas, which is given off on the application of heat and reduces the surface film of oxide, producing water which adds to the weight of the chloride of calcium tube.

SOCIETIES AND ACADEMIES

LONDON

Royal Society, March 16.—Preliminary Reports to Prof. Wyville Thomson, F.R.S., Director of the Civilian Scientific Staff. I. On the true Corals dredged by H.M.S. *Challenger* in deep water between the dates Dec. 30, 1870, and Aug. 31, 1875, by H. N. Moseley, Naturalist to the Expedition.

The author gives a list of the corals dredged in a depth of 50 fathoms and upwards, with notes on each. The whole is necessarily preliminary, on account of the impossibility of sufficient comparisons being made, and references obtained. The results embody great additions to our knowledge concerning the bathymetrical range of corals. Only one coral has been obtained from a greater depth than 1,600 fathoms; it is *Fungia symmetrica*. Only three other corals have been obtained at as great a depth as 1,500 fathoms. Only about twenty-seven genera of corals have as yet been proved to exist in a depth of 250 fathoms and upwards; of these a list is given, to which is added those obtained by the U.S. Coast Survey and the *Porcupine*, making forty-two genera in all. Of these twenty occur in the fossil state. No coral in any way allied to the Rugosa has been dredged by the *Challenger*.

II. On work done on board the *Challenger*, by Mr. John Murray, Naturalist to the Expedition. This Report includes the preliminary notice on oceanic deposits, describing specimens of the sea-bottoms obtained in the soundings, dredgings, and trawlings, over 300 in number, during the years 1873–1875, between England and Valparaiso. The deposits may be classed as follows :—

1. *Shore Deposits*—
   (*a*) Blue and green muds.—Met with near the shores of most of the great continents and islands.
   (*b*) Grey muds and sands.—Met with chiefly near oceanic islands of volcanic origin.
   (*c*) Red mud.—Met with on the eastern coast of South America.
   (*d*) Coral mud.—Met with near coral reefs.
2. *Globigerina Ooze*.—An abundant oceanic deposit not met with south of latitude 50° S.
3. *Radiolarian Ooze*.—An oceanic deposit met with only in the Western and Middle Pacific.
4. *Diatomaceous Ooze*.—An oceanic deposit met with only south of 50° S. latitude.
5. *Red and Grey Clays*.—The most abundant oceanic deposit.

The deepest sounding (4,475 fathoms) was a Radiolarian ooze.

In the early part of the cruise many attempts were made by all of the naturalists to detect the presence of free protoplasm in or on the bottoms from the soundings and dredgings, but with no definite result. It was undoubted, however, that some specimens of the bottom preserved in spirit assumed a very mobile or jelly-like aspect, and also that flocculent matter was often present.

At this point Mr. Buchanan determined that the flocculent matter was simply the amorphous sulphate of lime precipitated by spirit from the sea-water associated with the ooze. Subsequently a number of experiments were made, in conjunction with Mr. Buchanan, upon the behaviour of this amorphous precipitate when precipitated with different quantities of spirit, and when treated with colouring solutions. The precipitate was also examined alone and mixed up with some of the ooze. The ooze was examined at the same time, and in the same manner, but without having been treated with spirit. The results were shortly these :—

"When sea-water is treated with twice its volume of spirit or less, nearly the whole of the amorphous precipitate assumes the crystalline form in a short time.

"When treated with a great excess of spirit the precipitate remains amorphous, and assumes a gelatinous aspect.

"This gelatinous-like sulphate of lime colours with the carmine and iodine solutions, and when mixed with the ooze has, under the microscope, the appearances so minutely described by Haeckel.

"The ooze washed with distilled water, or taken just as it comes up, and treated in the same manner with colouring solution, does not show these appearances."

When it is remembered that the original describers worked with spirit-preserved specimens of the bottom, the inference seems fair that *Bathybius* and the amorphous sulphate of lime are identical, and that in placing it amongst living things the describers have committed an error.

A preliminary report on vertebrates is then given, containing a list of all the fishes taken in the trawl or dredge. New forms necessitate modifications in the definitions of some families, but it has not been found necessary to establish any new families. The deep-sea and oceanic forms belong to the families—*Stenoptychidæ*, *Macruridæ*, *Ophidiidæ*, *Scopellidæ*, *Stomiatidæ Pediculati*, *Halosauridæ*, *Notocanthi*, *Muraenidæ*, and *Trachinidæ*.

Of the Petrels and Penguins very extensive collections have been made, as skins and as spirit specimens. Two or three skeletons of very large specimens of the Sea-elephant have been preserved.

III. On observations made during the earlier part of the voyage, by the late Dr. R. von Willemöes-Suhm, naturalist to the Expedition. This report is on the Atlantic fauna only. Among the most interesting results obtained may be mentioned briefly the facts that shrimps in great depths are liable to be attacked by considerably large Gordiaceous worms; that a curious intermediate form between Priapulids and Sipunculids has been discovered; that relations of the famous Jurassic Eryonidæ are still living in the great depths, where they are (in the Pacific at least) by no means rare.

March 23,—"On the Force caused by the Communication of Heat between a Surface and a Gas; and on a New Photometer," by Prof. Osborne Reynolds, communicated by B. Stewart, F.R.S., Professor of Natural Philosophy in Owens College, Manchester.

This paper contains an account of an experimental investigation undertaken with a view to support, by absolute measurements, the theoretical arguments by which the author endeavoured to prove the existence of reactionary forces or "heat-