

chambers, excavated in the chalk, and approached by low narrow passages of some length.—A paper by M. Zaborowski, on ten crania from Rochefort, is continued from the January to the February number. M. Zaborowski argues in favour of the primitive ethnical identity of the blondes, wherever they are found in a state of purity, whether in the Caucasus, in England, or in Charente-Inférieure.—M. Zaborowski also contributes a paper on the circumcision of boys and the excision of girls as initiation ceremonies. He traces the origin of the custom in Asia and Europe to the influence of ancient Egypt.—M. de Saporta describes certain popular medical practices in Provence. In cases of delirium or meningitis, if the warm body of a recently killed pigeon is not available, they have recourse to a fried egg, which is placed, burning hot, on the forehead of the patient. M. de Saporta does not think that any supernatural virtue is attached to these practices.

SOCIETIES AND ACADEMIES.

LONDON.

Royal Society, May 31. —“On the Effect of Magnetisation upon the Dimensions of Iron Rings in Directions perpendicular to the Magnetisation, and upon the Volume of the Rings.” By Shelford Bidwell, F.R.S.

A recent communication (*Roy. Soc. Proc.*, vol. lv. p. 228) to the Society contained an account of some experiments relating to the effects of magnetisation upon the dimensions of two iron rings, one of which was annealed and the other hardened. The rings had the form of short cylinders about 6 cm. in diameter, 3 cm. in height, and 0.4 cm. in thickness. The experiments in question were concerned with the circumferential variations which took place along the lines of magnetisation; those to be here described deal with the concomitant variations in the height of the cylinders (width of the rings) transversely to the magnetisation. On the assumption that variations similar to the latter occur at the same time in the thickness of the

the other two were attached to the edges, opposite to one another, and parallel to the axis of the ring. The ring was inserted in a wooden case, also shown, through holes in which the four brass rods projected. Insulated wire for carrying the magnetising current was wound over the wooden jacket.

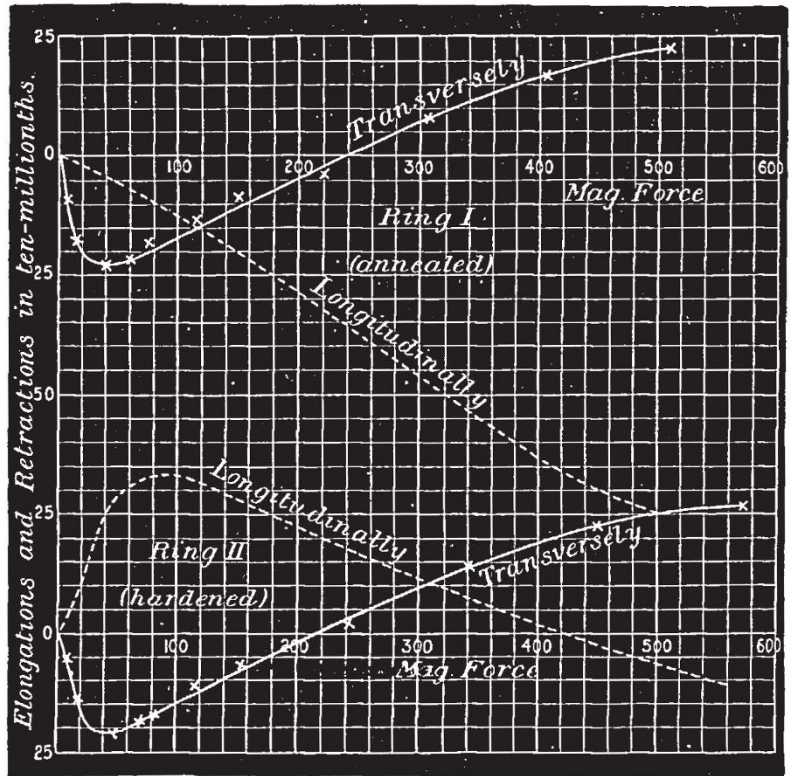


FIG. 2.—The curves marked “longitudinally” relate to circumferential changes, along the lines of magnetisation. Those marked “transversely” relate to changes in the width, perpendicular to the magnetisation.

For the new experiments the ring was placed in a horizontal position, one of the edge rods resting upon a brass socket on the adjustable base of the instrument, and the other, which had a chisel-shaped end (not shown in the figure), actuating the lever. To counterbalance the weight of the ring a horizontal arm, carrying a sliding weight, was fixed to the lower rod.

The annealed ring will, as before, be distinguished as Ring I. and the hardened one as Ring II.

The changes observed in the widths of the two rings (transversely to the magnetisation) are indicated in the curves of Fig. 2. It will be seen that they are quite similar in the two cases, little or no effect being produced by annealing. Under gradually ascending forces both rings first become narrower, then recover their original width, and ultimately become wider than when unmagnetised.

As was shown in my last paper, the effects along the lines of magnetisation are very different in the two rings. The annealed ring (Ring I.) begins to contract circumferentially with the smallest forces, and continues to contract with the large ones; while the hardened ring expands with small

forces and contracts with large ones. These effects are indicated in the figure by the dotted curves.

By combining the results of the old and of the new experiments we can ascertain the nature of the changes produced by magnetisation in the volumes of the rings. These are indicated

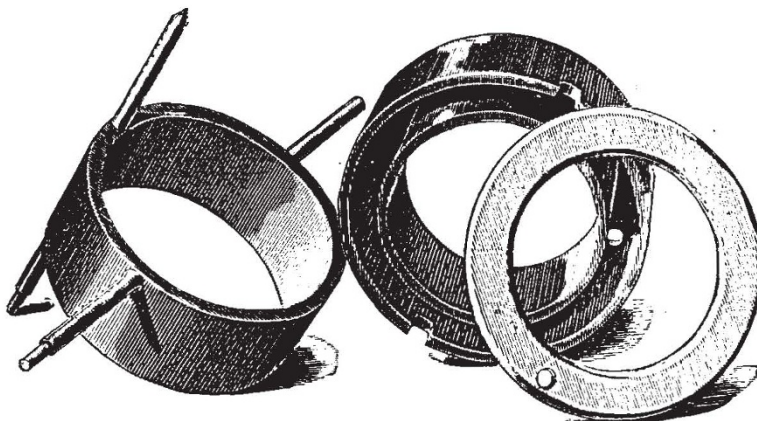


FIG. 1.

metal, it is possible to deduce the changes in the volume of the ring which attend magnetisation.

Fig. 1, from a photograph, shows how the rings were prepared for the experiments. Four brass rods were hard-soldered to the iron, two of them being in a line with a diameter, while

in Fig. 3, which shows that the volume of the annealed ring is rather suddenly diminished by a small magnetising force, passes a minimum under a force of about 50 units, and then slowly increases, until, with a force of 500 units, it is about 30 ten-millionths less than at starting. The unannealed ring also at

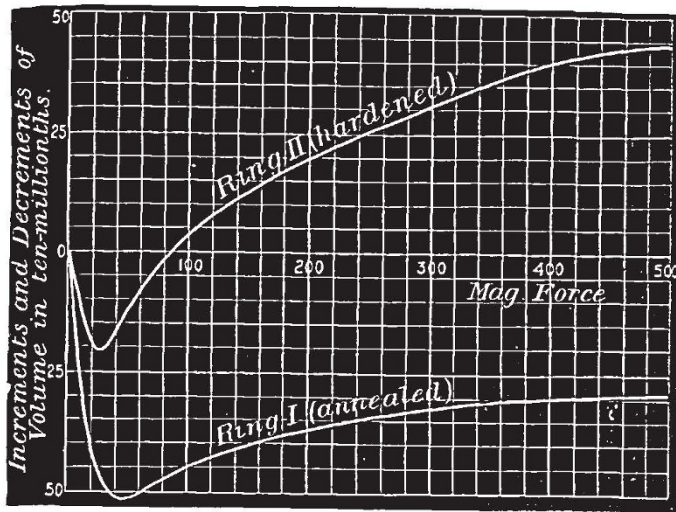


FIG. 3.

first suffers diminution, but its original volume is recovered with a force of about 90 and with higher values is increased.

The behaviour of this latter ring may be regarded as probably similar to that of the great majority of rods and rings, the annealed ring used in these experiments being the only specimen of iron that has yet been found to contract along the lines of magnetisation with the smallest forces that produced any effect at all.

EDINBURGH.

Royal Society, May 28.—Prof. James Geikie, Vice-President, in the chair.—Dr. Ramsey Traquair described some fossils from Forfarshire.—Dr. James Buchanan Young read a paper on the chemical and bacteriological examination of soil, with special reference to the soil of graveyards. He discussed the results of a series of experiments which he had made on samples of virgin soils, pure agricultural soils, and soils which had been, and were being, used for purposes of inhumation. From these results as judged by the amount of organic carbon and nitrogen present in the various samples, it would appear that soil which has been used for burial, does not materially differ as regards the amount of organic matter it contains from pure good agricultural soil. This fact goes far to support the idea that inhumation properly conducted in suitable and well-drained soils can cause no risk to the public health. The results of the bacteriological examination of the various soils goes to corroborate the results arrived at by chemical means. No pathogenic organisms were found in graveyard soils; and, although the number of bacteria present was greater than at similar depths in virgin soil, the number found was by no means so great as one might have expected. There was, moreover, a very marked and sudden fall in the number of micro-organisms in the soil below the layer containing the coffins. So that, as Reimers has pointed out, the "ground-water region" is practically free from bacteria. The broad results of the chemical examination of the samples is well seen in the annexed table. The results are stated in parts per hundred.

	Carbon.	Nitrogen.
Virgin soils	0.265	0.0257
Pure agricultural soils ...	0.842	0.0936
Soils used for inhumation	0.870	0.1073

—A paper, by Dr. J. G. Gilchrist, on the pallial complex of *Dolabella*, was read.—Dr. James Walker communicated an account of hydrolysis in some aqueous solutions.

June 4.—The Hon. Lord M'Laren, Vice-President, in the chair.—Prof. Tait read a note on the application of Van der

Waal's equation to the compression of ordinary liquids.—Prof. Geikie read a note, by Messrs. G. Sharman and E. T. Newton, on fossils from Seymour Island, collected by a recent Dundee expedition to the Antarctic Seas. Nine specimens had been found in a district farther south than districts previously explored. All represented existing genera of wide distribution, but the fossils indicated more genial climatic conditions than those now existing.—Prof. D'Arcy Thompson read a paper on certain difficulties in the study of classical zoology.

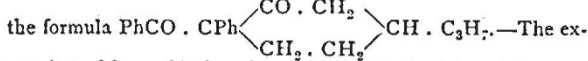
June 18.—Sir W. Turner, Vice-President, in the chair.—Prof. Copeland read a paper on the path of the meteor of May 18, 1894. This was a large meteor seen in daylight, and first observed somewhere between the island of Mull and the north end of Jura. It was last seen in the north-west district of Yorkshire. Observers judged it to be moving slowly, but calculation showed that it moved over 190 miles in about fifteen seconds.—Prof. Tait read a paper on the elastic equations of the ether in anisotropic dielectrics. He has not yet discussed the question of the stability of the condition of the ether indicated by his equations.—Dr. John Murray gave a comparison of the extra-tropical marine fauna of the northern and southern hemispheres. The similarity of the Arctic and Antarctic marine fauna, and the difference of both from the fauna of intermediate waters, indicate, according to Dr. Murray, a not very remote geological time at which a universal fauna—implying uniformity of temperature—existed. He believes that in Mesozoic times forms of life were driven from the poles towards the tropics, while the fauna which was able to remain under the altered polar conditions gave rise to the present polar fauna.—Prof. Tait gave some illustrations of the

range of application of Van der Waal's equation, contrasting the results got from the equation with observed results regarding the compression of liquids.—Dr. C. G. Knott and Mr. A. Shand read a paper on magnetic induction in nickel tubes. Three nickel tubes were compared, as regards their magnetic properties, with a nickel bar. All were cut from the same rod, were of the same length (44 cm.), and the same external diameter (4.2 cm.), but differed in diameter of bore. As with the iron and steel tubes formerly described (*Proc. R.S.E.*, 1893), a tendency was shown, in low fields, for the magnetic movements to approximate to the same value. But the tendency was not so well marked. The explanation seems to be that, because of the comparatively low susceptibility of nickel in low fields, the "diamagnetising factor" (so called by Dr. Du Bois) is not of the same paramount importance as in the case of iron or steel. A simple calculation showed that this factor was approximately proportional to the area of section of the metal wall of the tube.

July 2.—The Hon. Lord M'Laren, Vice-President, in the chair.—A paper, by Prof. Cayley, on co-ordinates versus quaternions, was communicated.—Prof. Tait read a paper on the intrinsic nature of the quaternion method.—Dr. C. G. Knott and Mr. A. Shand communicated a preliminary note on volume changes which accompany magnetism in nickel tubes. The three tubes, referred to the authors in their previous paper on magnetic induction in nickel, were employed. In high fields the internal volumes were markedly diminished in all three. The greatest measured change in volume was 2.4 cubic millimetres; this was in the tube of thinnest wall in field 600. The greatest cubical dilatation was $-2.3(10)^{-5}$, which was got in the tube of narrowest bore in field 600. The cubical dilatation, though negative in high fields, was positive in moderate fields, the change of sign occurring in a field which was lower as the wall of the tube was thinner. With the tubes of widest and intermediate bore, the cubical dilatation was negative in very low fields, each having critical fields for which the dilatation was zero. The tube of narrowest bore did not show this double change of sign. As was perhaps to be expected, the volume changes in the nickel tubes were distinctly greater than the like changes in the iron or steel tubes formerly investigated.—Dr. Gustave Mann communicated a paper on histological changes produced in nerve cells by their functional activity. Experiments on rabbits and dogs have shown that the nuclei and cells were larger in stimulated, than in non-stimulated ganglia. In the stimulated ganglia the lymph spaces practically disappear, while they are quite evident in the non-stimulated ganglia.

PARIS.

Academy of Sciences, August 20.—M. Lœwy in the chair.—Electricity considered as a vortical movement, by M. Ch. V. Zenger. The author shows that an electrical discharge produces a whirling movement in the gas through which it is discharged, which may be said to be a cyclone on a small scale, so completely are the phenomena of cyclones reproduced. The particles appear to describe a trajectory which may be represented by a screw of variable pitch traced on a conical surface.—New experiments permitting the comparison of the delivery of liquids, gases, and vapour from the same orifices, by M. H. Parenty. (1) The coefficients of delivery of gases are precisely equivalent to those of the submerged delivery of liquids. (2) These coefficients are not sensibly varied when the pressure and the back-pressure are modified in various ways; they are independent of the temperature and the atmospheric pressure. (3) There exists, for liquids, no analogous phenomena to the regularity of delivery of gases. The delivery of liquids is exactly and always the ordinate of a parabola, of which the loss of charge is the abscissa.—On the periodicity of the absorption rays of isotropic substances, by M. G. Moreau. The author concludes a mathematical investigation of this question as follows: In an isotropic absorbent, there should be two possible kinds of waves of propagation. The one gives bands by anomalous dispersion (they may be reduced to very fine and black rays by regular dispersion), the other gives less intense rays, but they are periodic and more numerous. They would form a kind of double refraction which observation does not seem to have indicated.—On the action of the halogen hydracids on formaldehyde in presence of alcohols, by M. Louis Henry. A claim for priority as against M. C. Fabre.—Action of camphoric anhydride on benzene in presence of aluminic chloride, by MM. E. Burcker and C. Stabil. Two substances besides the principal product, phenylcamphoric acid, have been isolated, namely, phenylcamphoric anhydride, $C_{16}H_{18}O_2$, and a diphenyl compound represented by



traction of free acids from beeswax, by M. T. Maire.—Influence of lesions of tissues on their aptitude for fixing dissolved substances, by MM. A. Charrin and P. Carnot. It is shown that dissolved substances tend to accumulate in unhealthy or injured tissues.—On some antitoxic properties of the blood of the terrestrial salamander (*Salamandra maculosa*) against curare, by MM. C. Phisalix and Ch. Contejean. The salamander requires eighty times as much curare as the frog for poisoning to take place. The immunity of the salamander may be due to the presence in its blood of some substance which neutralises the effect of this poison. In support of this hypothesis, it is found that a mixture of salamander-blood and curare in proper proportions does not act on the frog. This substance has a physiological action conferring immunity against curare, and not a direct chemical action on the latter, for the inoculation of frogs with salamander-blood twenty-four hours before the injection of curare enables the frogs to withstand a much larger dose than when the salamander-blood has been mixed with curare previous to injection.—On the budding of Diplosomidæ and Didemnidæ, by M. Maurice Caullery.—Researches on the respiration and assimilation of the Muscinæ, by M. B. Jönsson. There are great differences among the Muscinæ in regard to the intensity of respiration and chlorophyllian assimilation. For example, the different species disengage in the dark very different quantities of carbon dioxide per gramme of dry weight. The proportion of water present in the plants is an important cause of variation, the greater this proportion the more intense are the gaseous exchanges. Specimens taken from a very damp place give off more gas than specimens of the same species taken from a dry location. The reddish coloration of many mosses, very marked when the plants have been developed in the light, diminishes considerably the intensity of respiration and assimilation.—On the perithecae of the "Rot blanc" of the vine (*Charrinia diploidiella*), by MM. P. Viala and L. Ravaz.—On the chemical constitution of the atmosphere, by M. T. L. Phipson.

NEW SOUTH WALES.

Linnean Society, June 27.—Prof. David, President, in the chair.—Description of five new fishes from the Australasian region, by J. Douglas Ogilby. Of the species described, *Gil-*

lichthys mirabilis and *Clinus whiteleggi* were from the coast of New South Wales, *Ophioclinus de visii* from Queensland, *Petrosaurus icelii* from Lord Howe Island, and *Eleotris huttoni* from New Zealand.—The land molluscan fauna of British New Guinea, by C. Hedley. Two new species, *Sitala anthropogonum* and *Otofoma macgregoria*, were described and figured. It was considered that Mousson's genus *Trochonanina* should be merged into *Sitala*. Anatomical details of several species not before dissected were added.—Studies in Australian entomology. No. vii. New genera and species of *Carabida*, by Thomas G. Sloane. Three genera—*Notolestus* (type, *Abax sulcipennis*, MacL.), *Setalinomorpha* (Feronini), and *Lestianthus* (Helluonini)—and thirty-six species were described as new.—Wood moths: with some account of their life-histories, chiefly compiled from the notes of Mr. R. Thornton of Newcastle, by W. W. Froggatt. This paper gave a general account of the habits and food-plants of several species of *Eudoxyla* and *Charagia*, and of *Leto Stacyi*.—Botanical notes from the Technological Museum, Part ii., by J. H. Maiden and R. T. Baker. The notes included (1) a list of additional localities of New South Wales plants, (2) new varieties of New South Wales plants, (3) Queensland species new for New South Wales, (4) remarks on naturalised species in the colony, and (5) descriptions of unrecorded fruits.—Notes on plants collected on a trip to the Don Dorrigo Forest Reserve, by J. H. Maiden. The author traced the southern extension of plants hitherto recorded from the Clarence River and further north, and the northern extension of plants hitherto not recorded further north than the Macleay River, Blue Mountains, &c. He also described a number of well-marked varieties of certain species, and added notes on imperfectly described or little-known plants.

BOOKS, PAMPHLET, and SERIALS RECEIVED

BOOKS.—Peregrinazioni Psicologiche: Dr. T. Vignoli (Milano, Hoepli).—The Sportsman's Handbook: R. Ward, 7th edition (R. Ward).—Controversen in der Ethnologie: A. Bastian, i. ii. iii. (Berlin, Weidmann).—Celestial Objects for Common Telescopes: Rev. T. W. Webb, vol. 2, 5th edition (Longmans).—A Journey in other Worlds: J. J. Astor (Longmans).—Précis de Métérologie Endogène: F. Cann (Paris, Gauthier-Villars).—Evolution and Ethics: T. H. Huxley (Macmillan).
PAMPHLET.—The Molecular Tactics of a Crystal: Lord Kelvin (Oxford, Clarendon Press).
SERIALS.—American Naturalist, August (Philadelphia).—Bulletin de L'Académie Royale des Sciences de Belgique, 1894, No. 7 (Bruxelles).—English Illustrated Magazine, September (193 Strand).—Good Words, September (Isbister).—Sunday Magazine, September (Isbister).—Longman's Magazine, September (Longmans).—Chambers's Journal, September (Chambers).—Geographical Journal, September (Stanford).—Natural Science, September (Macmillan).—Humanitarian, September (Hutchinson).—Century Illustrated Magazine, September (Unwin).

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