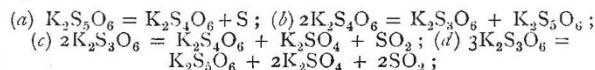March 1.—" On the Changes produced by Magnetization in the Dimensions of Rings and Rods of Iron and of some other Metals." By Shelford Bidwell, F.R.S.

Linnean Society, February 16.—W. Carruthers, F.R.S., President, in the chair.—Mr. Spencer Moore exhibited, and made some remarks upon, specimens illustrative of the *Palmella* state *Draparnaldia glomerata*.—Mr. D. Morris (Royal Gardens, Kew) exhibited a specimen of wood of *Hieronyma alchornioides* received from Trinidad, showing in its fissures mineral deposits, which on chemical analysis proved to be calcic carbonate. For comparison, Mr. Morris also exhibited and made some observations upon some deposits of calcic phosphate in teak. Some of these (described by Sir Fred. Abel, Quart. Journ. Chem. Soc. xv. 91), are 6 feet in length, 6 inches in breadth, and from $\frac{1}{8}$ inch to $\frac{3}{8}$ inch in thickness. Deposits in bamboo known as *tabasheer* (silicate) were shown, as also pearls (carbonate of lime) from cocoa-nuts, received from Dr. Sydney T. Hickson (see NATURE, vol. xxxvi. p. 157). All these specimens were from the Museum of Economic Botany of Kew.—Dr. Burn Murdock exhibited and offered remarks upon the intra-marginal (so-called) veins in the section *Arcolata* of the genus *Erythroxylon*, of which *E. coca* is the most familiar species. These lines are due to a thickening of the parenchymatous tissue which takes place in the bud stage, and are in no way connected with the venation of the leaf.—Mr. G. F. Sherwood exhibited a collection of photographs taken in Samoa, illustrating the scenery and people, together with a number of necklets formed with strings of various bright-coloured seeds.—The first paper of the evening was read by Mr. H. N. Ridley, on self-fertilization and cleistogamy in orchids. Three common methods of self-fertilization were explained : (1) by the breaking up of the pollen mass, and falling of the dust either directly upon the stigma, or into the lips whence it comes into contact with the stigma ; (2) by the falling of the pollen masses as a whole from the clinandrum into the stigma ; and (3) by the falling forward of the pollinia from the clinandrum, or the anther cap, the caudicle and gland remaining attached to the column. An interesting discussion followed, in which Prof. Marshall Ward, the Rev. G. Henslow, and Mr. A. W. Bennett took part.—A paper was then read by Dr. John Rae, F.R.S., entitled " Notes on some of the Birds and Mammals of Hudson's Bay Territory." Dr. Rae, whose long residence in Northern and Arctic America enabled him to speak authoritatively from personal observation, gave an interesting account of the migration of the Canada goose, snow goose, and blue-winged goose, and of the habits of the American hare and lemming. He particularly referred to the belief entertained by some of the Indian tribes he had met with, and to which he himself gave credence, that certain species of small birds are assisted on their migrations by being carried on the backs of the Canada geese. Mr. J. E. Harting, in criticising this paper, gave an exposition of the views held by leading ornithologists on the subject of the American Canada and snow geese, their relationship and nomenclature, and pointed out that the story of small birds being carried by larger ones is not confined to North America, but is current in South-Eastern Europe, Palestine, and Arabia, where trustworthy evidence has been obtained that wagtails and other small birds travel on the backs of cranes. He added that one instance was known to him of such an occurrence in England, a short-eared owl having been seen to arrive on the north coast of Yorkshire carrying on its back a golden-crested wren, which was secured by the observer.

Chemical Society, February 16.—Mr. W. Crookes, F.R.S., in the chair.—The following papers were read :—Chemical investigation of Wackenroder's solution, and explanation of the formation of its constituents, by Prof. Debus, F.R.S. Wackenroder's solution is obtained by passing hydrogen sulphide into an aqueous solution of sulphur dioxide until the latter is decomposed. It has been considered to contain sulphur in suspension and pentathionic acid in solution, although neither the acid nor its salts have been prepared pure, and, in consequence, Spring has denied the existence of the acid, regarding it as a solution of sulphur in tetrathionic acid. The author finds that Wackenroder's solution contains: (1) sulphur in suspension in very minute drops, (2) a new allotropic modification of sulphur, (δ), in simple solution, and in the colloidal condition, (3) traces of trithionic acid, (4) tetrathionic acid, (5) pentathionic acid, and (6) a polythionic acid containing more sulphur than the penta- acid, probably hexathionic acid. Pure potassium and copper pentathionates were prepared, and the reactions of the

polythionates studied, among the most interesting of which are the spontaneous changes in aqueous solution shown by the equations—

(*a*) $K_2S_5O_6 = K_2S_4O_6 + S$;   (*b*) $2K_2S_4O_6 = K_2S_3O_6 + K_2S_5O_6$;
(*c*) $2K_2S_3O_6 = K_2S_4O_6 + K_2SO_4 + SO_2$;   (*d*) $3K_2S_3O_6 = K_2S_5O_6 + 2K_2SO_4 + 2SO_2$;

the reactions (*a*) and (*b*) occurring in either direction with equal facility. The final products of the action of hydrogen sulphide on tetra- and penta-thionic acids are water and sulphur. The polythionic acids can also be obtained by the action of sulphur dioxide on potassium thiosulphate or on the chlorides of sulphur. The concluding portion of the paper was devoted to a discussion of the formulæ of the polythionates.—Potilizin's law of the mutual displacement of chlorine and bromine, by Prof. Thorpe, F.R.S., and Mr. J. W. Rodger. On heating bromine with an equivalent quantity of an anhydrous metallic chloride in a sealed glass tube, free from air, to the temperature of the melting-point of zinc, Potilizin found that the amount of chlorine displaced by bromine was greater the higher the atomic weight of the metal in the chloride ; and further, that, if A be the atomic weight of the metal, p the percentage of chlorine displaced from its chloride when treated as above, and E its valency, the formula $\dfrac{A}{pE^2}$ = a constant held good in the case of fourteen chlorides. To test the validity of this law, the authors heated the chlorides of sodium, potassium, silver, strontium, barium and lead with bromine at 350°–450°, and found that, with the exception of silver chloride, in which the deviation was not so marked, the amount of chlorine displaced was considerably less than that required by Potilizin's law, and in all cases stood in no definite relation either to the duration of heating or to the atomic weight of the metal of the chloride used, although most chlorine was displaced from the chloride of highest molecular weight when several were heated simultaneously. These experiments therefore disprove the validity of Potilizin's law. —A gasometric method of determining nitrous acid, by Dr. P. F. Frankland. Based on the interaction of urea and nitrous acid.—The action of some specific micro-organisms on nitric acid, by the same. The author has investigated the behaviour, when grown in nutritive solutions containing nitrates, of a number of micro-organisms obtained from air and water, and cultivated in a state of purity. Of thirty-two different forms so examined, sixteen or seventeen, and particularly *Bacillus ramosus* and *B. pestifer*, were found to reduce the nitrate to nitrite more or less completely, whilst the remainder were quite destitute of this power. The behaviour of the organisms was not altered in this respect by excluding air from the solutions in which they were cultivated.—The action of phosphorus penta-chloride on salicylaldehyde, by Mr. C. M. Stuart.—Some interactions of nitrogen chlorophosphuret, by Mr. W. Couldridge. —Action of alcohols on ethereal salts in presence of small quantities of sodic alkylate, by Prof. Purdie and Mr. W. Marshall. —Note on the densities of cerium sulphate solutions, by Dr. B. Brauner. The values of the densities of solutions of the anhydrous and of the hydrated salt are identical for solutions of equal concentration.

ERRATUM.—P. 406, second column, line 9 (from top), *for* $v = (n^2 - 1)(n^2 + 2)$ *read* $v = (n^2 - 1)/(n^2 + 2)$.

Physical Society, February 25.—Prof. Reinold, F.R.S., President, in the chair.—The following papers were read :—Note on the efficiency of incandescent lamps with direct and alternating currents, by Prof. W. E. Ayrton, F.R.S., and Prof. J. Perry, F.R.S. This relates to the question whether the "efficiency" (candles per watt) is greater or less for alternating than for direct currents. Experiments made by Messrs. Shepherd and Wheatley, two of the students at the Central Institution (to whom the authors express their thanks for the valuable assistance rendered) show that no appreciable difference can be detected when the lamp is at the same candle-power. In performing the experiments, three-way switches in connection with Gramme and Ferranti machines were arranged so that the current through the lamp could be quickly changed from direct to alternating, or *vice versâ*, adjustable resistances having been previously placed in the two circuits to give equal readings on a Cardew voltmeter placed as a shunt to the lamp. The currents were measured by a reflecting dynamometer wound with fine wire in order to make the error, due to unequal current density over the section, negligible. The problem has also been investigated from