

that office in July next. Since 1901 he has been president of Davidson College, N. Carolina, where he previously held the chair of physics. He is well known in the Southern States as a lecturer on scientific and educational topics at summer schools, "Chautauquas," &c.

THE annual gathering of the South-Western Polytechnic Institute was held on Friday, March 15. The Right Hon. W. Hayes Fisher, M.P., chairman of the governing body, presided, and a report on the work of the session 1910-11 was read by the principal. The report showed that 988 students joined for work in the day and 1575 in the evening during the session, that nearly 600l. was gained in outside scholarships by the students, and that a large number of university and other successes had been gained. After distributing the certificates and prizes, Sir David Gill, K.C.B., F.R.S., addressed the students. He impressed on them that knowledge was the latent power of doing things, that what they gained in their classes constituted their mental tools, and that they should learn something of everything, and, above all, they should learn everything of something. He advocated the formation of a department of astronomy to include, what he considered most important, instruction in the practice of finding one's position in an unmapped country. He had met with many young engineers who were quite at a loss when they were asked to lay down a railway track in an unmapped country. The vote of thanks was proposed by Sir William White, who referred to Sir David's work on the sun's distance, and seconded by the Mayor of Chelsea. About 2400 guests attended the conversazione afterwards.

A ROYAL COMMISSION to inquire into the methods of appointment to and promotion in the Civil Service and other cognate matters has been appointed. The terms of reference are:—To inquire into and report on the methods of making appointments to and promotions in the Civil Service, including the Diplomatic and Consular Services, and the legal departments; to investigate the working and efficiency of the system of competitive examination for such appointments, and to make recommendations for any alterations or improvements in that system which may appear to be advisable; to consider whether the existing scheme of organisation meets the requirements of the Public Service, and to suggest any modifications which may be needed therein. The commission is constituted as follows:—the Lord MacDonnell, G.C.S.I., K.C.V.O. (chairman), the Duke of Devonshire, the Bishop of Southwark, Sir Henry Primrose, K.C.B., Sir Kenneth Muir-Mackenzie, G.C.B., K.C., Sir Donald Macalister, K.C.B., Sir Guy Granet, H. Baker, M.P., J. R. Clynes, M.P., S. J. G. Hoare, M.P., R. D. Holt, M.P., P. Snowden, M.P., A. A. Booth, A. Boutwood, P. E. Matheson, A. E. Shipley, Graham Wallas, Miss Haldane, and Mrs. Dean Streetfeild. The secretary to the commission is S. Armitage-Smith, of the Treasury, to whom correspondence may be addressed at Treasury Chambers, Whitehall, S.W.

SOCIETIES AND ACADEMIES.

LONDON.

Royal Society, March 14.—Sir Archibald Geikie, K.C.B., president, in the chair.—Prof. E. Goldmann: A new method of examining normal and diseased tissues by means of *intra-vitam* staining. The author's original method of *intra-vitam* staining by injection of trypan and isamin blue has been greatly advanced in several points described.—Dr. E. K.

Martin: The effects of ultra-violet rays on the eye. Three lines of investigation have been taken and carried out, in each case on rabbits:—(1) *Absorption*.—Using an iron arc as the source of light and a quartz spectrograph, the absorption of the media of the eye was found to be as follows:—Cornea.—All rays of wave-lengths less than 295 $\mu\mu$ are cut off completely. Lens.—Absorption commences at 400 $\mu\mu$ and is complete beyond 350 $\mu\mu$. Vitreous.—Shows a broad absorption band with ill-defined margins extending from 280-250 $\mu\mu$. All the media were found to be uniformly permeable to rays between the wave-lengths 660-400 $\mu\mu$. (2) Results of repeated exposure of eye to light containing a high proportion of ultra-violet rays. A series of animals were exposed at repeated intervals for from three to twelve months. They showed marked inflammatory reaction in the cornea and conjunctiva, and in one case a proliferation of the cells of the anterior lens capsule. (3) Transmission of hæmolysins to aqueous humour after exposure of eye to short wave-length rays. The aqueous of animals which have been sensitised to the blood of another species has no power of hæmolysing red blood-corpuscles of that species. After exposure of the eye of such an animal to the quartz mercury vapour lamp, the aqueous becomes actively hæmolytic, and remains so for a period not as yet determined, but in any event longer than the duration of the resulting inflammatory changes.—Dr. W. S. **Lazarus-Barlow**: The presence of radium in some carcinomatous tumours. Elsewhere the author published evidence that acceleration of electroscopic leak may be produced by the residue of carcinomatous tissue after its extraction with ether and subsequently with water, or after extraction with acetone. The results were criticised as being small, and as possibly explicable by alteration in capacity of the electroscopes occasioned by introduction of the substances within it. The subject was therefore reinvestigated with an electro-scope of constant capacity in which a fixed wire grating separated the portion containing the gold-leaf from the portion into which the substances were introduced. Twenty-seven samples of primary carcinoma, eight of secondary carcinoma, two sarcomata, and five normal livers and lungs were examined under these conditions, and the original conclusion was confirmed.—C. **Russ**: An improved method for opsonic index estimations involving the separation of red and white human blood corpuscles. The observed errors by the improved method were one quarter the magnitude of those by the old process, the conditions of experiment being almost completely comparable.—Prof. W. M. **Thornton**: The electrical conductivity of bacteria, and the rate of inhibition of bacteria by electric currents. Tap water containing *B. coli communis* can be completely sterilised by direct currents in several hours at 0.2 ampere sq. cm. Alternating currents sterilise water nearly, if not quite, as well as direct currents having the same current-density. Milk is curdled by direct current at the positive pole and thinned at the negative pole. Milk can be sterilised without curdling by passing alternating current, this being largely thermal. The cause of the marked bactericidal action of light is suggested to be syntony between it and the frequency of electronic rotation in the atoms of protoplasm.—E. C. **Hort** and W. J. **Penfold**: A clinical study of experimental fever. *Conclusions*: (1) That the establishment as separate entities of these various types of fever no longer rests on secure ground; (2) that future advance in the experimental study of fever is not possible unless precaution be taken to ensure that the water or saline used for injection is free from the fever-producing body described.—S. G. **Shattock** and L. S. **Dudgeon**: Certain results of drying non-sporing bacteria in a charcoal liquid

air vacuum. The bacteria used comprised *B. coli*, *B. typhosus*, *Staphylococcus pyogenes aureus*, *B. pyocyaneus*. The action of light was excluded during the experiments. *B. typhosus* and *B. coli* died both *in vacuo* and in air-dried slips within five days. *S. pyogenes aureus* persists considerably longer under both conditions. The interest centres around *B. pyocyaneus*. Air-dried films did not survive beyond nine days. The slips kept *in vacuo* were alive at seven months. *B. pyocyaneus* was submitted *in vacuo* to the action of heat, and also to the sun's rays (the sealed vacuum tubes being submerged in water). Its resistance to these agencies, in the dried state, *in vacuo*, was not materially, if at all, increased. The bacillus was killed, moreover, by the action of ultra-violet rays on being removed from the vacuum and treated in an atmosphere of nitrogen. So far as the possibility of interplanetary bacterial life is concerned, it is evident that bacteria in the fully dried state, if free in the interplanetary vacuum, would be killed by the solar light. As Sir James Dewar's experiments have demonstrated that the ultra-violet rays will kill undried bacteria whilst in the frozen condition at the temperature of liquid air, there is little to support the hypothesis that the living protoplasm on the earth originally immigrated from interplanetary space in a free or uninclosed condition—that free, particulate life has entered the earth's atmosphere, as a result of light propulsion, from extramundane space.

Zoological Society, February 20.—Dr. A. Smith Woodward, F.R.S., vice-president, in the chair.—Dr. A. T. Masterman: Recent investigations on age-determination in the scales of salmonoids, with special reference to Wye salmon.—Dr. H. Lyster Jameson: The structure of the shell and pearls of the Ceylon pearl-oyster (*Margaritifera vulgaris*, Schum.); with an examination of the cestode theory of pearl production. The author began by reviewing the work on the subject of pearl production carried out in Ceylon by Prof. Herdman, F.R.S., and his successors. He examined the theory, enunciated by Prof. Herdman, that most Ceylon "fine" pearls had for their nuclei the remains of cestode larvæ, and that these larvæ, which are abundant in the liver and connective tissues of the pearl-oyster in Ceylon, were the "cause" of the most valuable pearls. Dr. Jameson maintained that the evidence adduced in support of this theory by Prof. Herdman and Mr. Hornell was insufficient. The second part of the paper dealt with the structure and formation of the shell and of pearls. The various repair-substances, which replace the ordinary shell substances under abnormal or pathological conditions, were described, their relations to the normal substances of the shell were discussed, and their occurrence in the pseudo-nuclei of pearls dealt with. The "calcospherules" which Herdman regarded as free concretions, and as the cause of "muscle pearls," were considered to be in fact minute pearls, composed of the hypostracum, or special shell-substance to which the muscles are attached. The author maintained that, as he had already laid down in his 1902 paper, the real cause of pearl production would have to be sought, not in the nuclei or pseudo-nuclei of pearls, but rather in the pathological conditions under which the tissues of the mollusc gave rise to the pearl-sac.—R. Shelford: Mimicry amongst the Blattidæ; with a revision of the genus *Prosoplecta*, Sauss. The author dealt with a number of exceptions to this usually cryptically coloured type of cockroach, and in greater detail with the *Prosoplecta*, nearly all the members of which presented a remarkably close and detailed resemblance to other insects.—Rev. O. Pickard-Cambridge: A contribution to the knowledge of the

spiders and other arachnids of Switzerland. The paper was based on a number of specimens collected for the author by various persons, at different times, and contained the description of one new species.

March 5.—Sir J. Rose Bradford, F.R.S., vice-president, in the chair.—H. L. Hawkins: The classification, morphology, and evolution of the Echinoidea Holoctypoida.—H. G. Plimmer: The blood-parasites found in the Zoological Gardens during the four years 1908-11. The paper contained the results of examination of the blood of 6430 animals, in about 7 per cent. of which parasites were found. Many of these parasites were described for the first time, and in other cases the hosts were newly recorded.—Prof. G. O. Sars: Zoological results of the third Tanganyika expedition, conducted by Dr. W. A. Cunnington, 1904-6. Report on some larval and young stages of prawns from Lake Tanganyika.—Dr. R. Broom: The structure of the internal ear, and the relation of the basi-cranial nerves in *Dicynodon*, and on the homology of the mammalian auditory ossicles.

Royal Microscopical Society, February 21.—Mr. H. G. Plimmer, F.R.S., president, in the chair.—Mr. Rousset: Fourth list of new Rotifera since 1889. The year 1889 was when Hudson and Gosse's monograph of the Rotifera was completed by the issue of the supplement, recording altogether 400 species at that time. The author explained that his three preceding lists, published in 1893, 1897, and 1902, contained 393 new species, and the fourth list now submitted 214 names, a total of 607 new species since 1889. Mr. Rousset estimated the present Rotiferous population of the world comprised 857 species. The greatest number of new species in the present list appeared amongst the Bdelloid Rotifers; 101 species, mostly described by James Murray, were obtained from moss collected by him from all parts of the world, from Scotland to the Antarctic regions. Of the other orders represented there were Rhizota, 8; Ploima-Illoricata, 30; Ploima-Loricata, 74; and Scirtopoda, two new species.

Linnean Society, March 7.—Dr. D. H. Scott, F.R.S., president, in the chair.—Prof. Percy Groom: Note on the internodes of Calamites. The author contended that the nodes corresponded to a cycle of growth during the vegetative season, and supported his views by measurements supplied by Dr. F. J. Lewis.—Rev. T. R. R. Stebbing: Historic doubts about *Vaunthompsonia*. The author pointed out that the number of the *Natural History Review* for July, 1858, was received by the British Museum at the date stamped as "16 JY 58," thereby proving its priority over *Vaunthompsonia*.

Mathematical Society, March 14.—Mr. J. E. Campbell, vice-president, in the chair.—G. T. Bennett: The cubic surface as a degenerate quartic.—E. B. Elliott: Differential operators which generate all seminvariants and all ternary covariant sources.—W. H. Young: Goursat's form of Cauchy's theorem (informal).

Mineralogical Society, March 12.—Prof. W. J. Lewis, F.R.S., president, in the chair.—Dr. G. F. Herbert Smith and F. N. A. Fleischmann: The zeolites from Killyflugh and White Head, Co. Antrim. Chabazite occurs in three different kinds of crystals and gmelinite in two, and the former is found pseudo-morphous after calcite. Analcite occurs in clear trap-zohedra, and natrolite in fine needles. The character of the occurrences was described.—Dr. J. Drugman: Quartz twins. Further specimens of bipyramids, twinned on the primary rhombohedron, from the Esterel, France, were shown, thus establishing this mode of twinning, which was first described by Q.

Sella in 1858. From the same locality were shown also bipyramids twinned on $\xi(11\bar{2}2)$, in which, too, the prism is absent, and there is no flattening perpendicular to the twinning plane, as in the Dauphiné and Japanese specimens.—T. V. **Barker**: Note on the optical properties of mercuric iodide. Preliminary determinations by means of two 30° prisms gave 2.746 and 2.447 as the values of the ordinary and extraordinary refractive indices for sodium, and 2.566 and 2.357 for lithium light, respectively, the degree of accuracy being about 0.002. More accurate values are anticipated when better prisms have been prepared, but the results so far obtained suffice to show that the double refraction and colour dispersion are remarkably large in amount.—Arthur **Russell**: Notes on the minerals and mineral-localities of Shropshire. The occurrences of thirty-two species, excluding rock-forming minerals, were described. Calcite was obtained at Snailbeach Mine, Minsterley, in splendid crystals of varied habit, among others being large, pale mauve rhombohedra twinned on $c(111)$, and opaque, white, prismatic crystals twinned on $r(100)$. Very large crystals of barytes and fine crystals of calcite came from Wotherton Mine, Chirbury. The occurrence of pyromorphite and witherite at several localities was noted.—Dr. Emil **Hatschek**: A series of specimens and lantern-slides illustrative of some reactions in gels. An inorganic gel (silicic acid) was used, and the compounds resulting from the diffusion in it of several solutions were shown; there was a tendency to banding in the upper part of the precipitate, while spherulitic growths appeared in nearly every case.—W. Campbell **Smith**: A spherulitic dolerite from Vryheid, Natal. The rock was interesting on account of the size and beauty of the spherulites, which are revealed on the weathered surfaces.

Royal Anthropological Institute, March 19.—Mr. Alfred P. Maudslay, president, in the chair.—Dr. C. S. **Myers**: Primitive music. The chief objects and methods of studying the music of primitive peoples were described, illustrated by examples from Borneo (Sarawak), Torres Straits (Murray Islanders), and Ceylon (Veddhas). The music of the Murray Islanders and of the Todas was analysed to show (1) the wide difference even between such very simple forms of music belonging to two distant peoples; (2) the different lines of musical development traceable within different communities; (3) the great importance, alike for ethnology and for musical history, of studying the process of diffusion of the various styles of music and also of musical instruments, in regard to their form, their intervals, and their absolute pitch.

EDINBURGH.

Royal Society, February 19.—Prof. Ewart, F.R.S., vice-president, in the chair.—Dr. Thomas **Scott**: The Entomostraca of the Scottish National Antarctic Expedition. The collection consisted chiefly of Copepoda, of which there were 145 species, three parasitic, the rest free-living. Sixty-two species, including one new variety, belonged to the suborder Calanoida. The Harpacticoida were represented by forty-one species, twenty-eight being new, with two new genera, almost all taken in or near Scotia Bay, South Orkneys. There were twenty-seven species (three new and one new variety) of Cyclopoida, and one species of Caligoida. The Cladocera in the collection were represented by two species of Evadne. There were twenty-two species of Ostracoda, of which fourteen (ten new) were collected in Scotia Bay.—Dr. W. E. **Hoyle**: The Cephalopoda of the Scottish National Antarctic Expedition. Six species were taken off South Africa, four (one new) off South

America, and four were Antarctic, being obtained near Scotia Bay. The new species of *Polypus*, *P. Brucei*, was represented by a single male specimen from the Burdwood Bank, off Tierra del Fuego. Male and female specimens of *Moschites charcoti*, examples of which have been only once previously recorded, were taken in Scotia Bay.—Prof. W. A. **Herdman**: The Tunicata of the Scottish National Antarctic Expedition. The collection was a large one, characterised by the abundance and large size of individuals, by the excellent preservation of the specimens, and by morphological variations. Of the Ascidiaceæ (simple and compound), there were sixteen different species (one new) in six families of six genera, mostly obtained from the Falkland and South Orkney Islands. The new species, *Fungulus antarcticus*, was a deep-sea form obtained in lat. 64° S. at a depth of 2485 fathoms. The rare genus *Fungulus* is represented by only another solitary specimen, *F. cinereus*, Herdman, got by the *Challenger* at 1600 fathoms' depth in lat. 46° S. between the Cape of Good Hope and Kerguelen Island, at least 3000 miles distant from where the new species was found.—Prof. Andrew **Gray**: General dynamics. Note I.: Hamilton's partial differential equations and the determination of their complete integrals. The partial differential equations were deduced directly from the canonical equations, and important use was made of the second partial differential equation which is satisfied by the function S' , a function which has been comparatively little used. Some interesting relations between the functions S and S' were established, and were utilised in applications.—Prof. Sutherland **Simpson**: An investigation into the effects of seasonal changes on body temperature. The experiments were made with 114 domestic fowls, six different breeds being represented. In a general way the body temperature followed that of the external air, being lowest in the winter months and highest in the summer months. The barometric pressure had no influence. The curve of egg-production reached its highest level in April and May; and in general it was found that cyclical body changes had little or no effect on body temperature as compared with outside influences.

MANCHESTER.

Literary and Philosophical Society, February 20.—Prof. F. E. Weiss, president, in the chair.—Prof. W. H. **Lang**, F.R.S.: Branching in the Ophioglossaceæ. The branching in *Helminthostachys* was shown to be related to the vestigial buds discovered by Gwynne-Vaughan. The vascular supply to the branch was connected with the stele of the rhizome, and not with the subtending leaf-trace. Vestigial buds are also constantly present in the axils of the leaves of *Botrychium lunaria*, and may have a vestigial vascular supply derived from the margins of the subtending leaf-trace. When a branch develops, its vascular supply is from the leaf-trace, and not from the stele of the stem. The branches that occur occasionally in *Helminthostachys* and *Botrychium* are not "adventitious," but originate from these dormant axillary buds. They are comparable with the branches of the *Hymenophyllaceæ* and *Zosteroidiaceæ*, and their structure strengthens the probability of a relationship between the Ophioglossaceæ and the latter group.—T. G. B. **Osborn**: Recent investigations into the nature of the moulds which attack exported cotton goods. Several common fungi and bacteria were found infecting the goods.

March 2.—Prof. F. E. Weiss, president, in the chair.—R. L. **Taylor** and Clifford **Bostock**: The action of dilute acids on bleaching powder. In these in-

vestigations a method originally described by Taylor was used for distinguishing between free chlorine and hypochlorous acid, and, in a mixture of the two, determining their relative amounts. Bleaching powder was distilled with varying amounts of different acids, together with a considerable amount of water. Hydrochloric, sulphuric, and nitric acids act pretty much alike, giving off, with comparatively small amounts of acid, almost pure hypochlorous acid, but, with larger amounts of acid, mixtures of hypochlorous acid and chlorine, and finally nothing but chlorine. Acetic and phosphoric acids act in the same way with small amounts of acid, but the hypochlorous acid never entirely disappears, even with large quantities of acid. When bleaching powder is distilled with boric acid (and a sufficient amount of water), practically pure hypochlorous acid is produced, even when the boric acid is used in comparatively large quantities. Although at the ordinary temperature carbon dioxide liberates nothing but chlorine from bleaching powder, as the temperature is raised hypochlorous acid begins to be evolved, mixed with chlorine, and when the liquid is actively boiling practically pure hypochlorous acid is produced.—Dr. A. Holt, Dr. Edgar, and Mr. Firth: Sorption of hydrogen by palladium. Experiments lead to the following conclusions:—(1) Palladium is not always in a condition in which it will absorb hydrogen, but it can be made to do so by heating to about 400° C. in either air or *in vacuo*. The power of picking up gas dies away with time, and cannot be restored unless the metal is reheated. (2) Hydrogen is first condensed on the surface of the metal (adsorbed layer), and then gradually diffuses inwards (absorption). It is possible to get the metal either saturated outside and with no gas in the interior, or saturated in the interior and not on the surface. (3) Diffusion of hydrogen through the metal begins at about 120° C., and increases in rate with rise of temperature. The same temperature does not, however, always produce the same rate, as it depends somewhat on the state of the metal. The rate does not obey any simple law of diffusion or effusion.

PARIS.

Academy of Sciences, March 4.—M. Lippmann in the chair.—A. Lacroix: The granular rocks intrusive in the basaltic breccias of Reunion. Their importance in the interpretation of the origin of the homogeneous enclosures of the volcanic rocks. The author has been led by a study of the *massif* of the Piton des Neiges at Reunion to modify his views on the formation of the enclosures, and considers that they must be regarded as having been formed in the volcano itself and not consolidated at great depths.—MM. Leclainche and Vallée: The specific treatment of wounds. Details of the preparation of a polyvalent serum for the treatment of wounds, and a preliminary account of the results obtained by its use.—Emile Belot: The formation of the lunar craters with experimental reproduction.—Frédéric Riesz: Some points in the theory of summable functions.—MM. Papin and Rouilly: The gyropter. A description of a helix for use in aërostats, driven by reaction and having no mechanical connection with the motor.—A. Grumbach: The detection of very small quantities of material by the direct electrometric method.—Pierre Achalme: The function of interatomic electrons in electrolysis.—Georges Baume and Néoptolème Georgitses: The fusibility curves of some volatile binary systems at very low temperatures. The binary systems investigated were hydrogen chloride-hydrogen sulphide, hydrogen chloride-ethane, and hydrogen chloride-propionic acid. The melting points of these

mixtures were studied down to -170° C., and the results given as curves.—A. Faucon: The rotatory power of camphor dissolved in carbon tetrachloride as a function of the concentration. An expression has been deduced from the experiments giving the rotatory power of solutions of camphor in carbon tetrachloride. The influence of temperature on the rotation has also been studied.—A. Recoura: The complex ferric compounds. Ferric fluoride.—A. Magnan: The weight of the stomach in mammals.—Mieczyslaw Oxner: Experiments on memory and its duration in marine fishes. The experiments were carried out with freshly caught specimens of *Coris julis* and *Serranus scriba*; these fishes were able to remember colour, and the memory lasted not less than twenty-five days.—O. Dubosq and Ch. Lebailly: The spirochæta of fishes.—M. Sollaud: The metamorphoses of *Leander serratus*.—Raphael Dubois: Clasmotosis of the shell and pearl: its function in the formation of the mollusc shell and of pearls. The formation of pearls cannot be traced to a single cause, and the author concludes that the mechanism of the formation of the shell and the pearl is the same. The mechanism consists fundamentally in the formation of two secretions. It results from these researches that there are two modes of pearl formation, one parasitic and the other non-parasitic.—Michel Cohendy: Experiments on life with pure cultures following on aseptic life. In a previous paper the author has described the growth of fowls raised under absolutely aseptic conditions. In some cases the bird was accidentally contaminated with micro-organisms, and these cases have been kept under observation in order to see how they affected the development. The result showed that the sterile chicken is not abnormally sensitive to microbial action. It would appear, however, that a bacterium innocuous to the non-aseptic bird may become pathogenic to the aseptic bird.—Alfred Carpentier: The discovery of a *Psaronius* with a well-preserved structure in the lower Westphalian in the north of France.—P. E. Dubaleu: The warm springs of the department of the Landes.

BOOKS RECEIVED.

- Über die Luftsäcke der Vogel. By F. E. Schulze. Pp. 36+plate. (Jena: G. Fischer.) 1.60 marks.
- Experimentelle Studien zur Soma- und Geschlechtsdifferenzierung. By Prof. J. Meisenheimer. Pp. 28. (Jena: G. Fischer.) 1 mark.
- Handwörterbuch der Naturwissenschaften. Edited by E. Korschelt and others. Zweite und Dritte Lieferung. Pp. each 160. (Jena: G. Fischer.) 2.50 marks each.
- Johnston's Handbook to the Celestial Globe. Pp. 32. (Edinburgh and London: W. and A. K. Johnston, Ltd.) 1s.
- Über die Helligkeit des Himmels in der Nahe der Sonne. By H. Diercks. Pp. 48. (Kiel: Lüdtke & Martens.)
- Propriétés Optiques des Muscles. By Dr. F. Vlès. Pp. xvii+372. (Paris: A. Hermann & Fils.) 15 francs.
- Forme, Puissance et Stabilité des Poissons. By Prof. F. Houssay. Pp. 372. (Paris: A. Hermann & Fils.) 12.50 francs.
- Proceedings of the London Mathematical Society. Second series. Vol. x. Pp. vi+486. (London: F. Hodgson.)
- Über die Gesetze der Wärmestrahlung. By W. Wien. Pp. 21. (Leipzig: J. A. Barth.) 1 mark.