

sideration of scientific speculations, may help to give that solidity and elasticity to public opinion which is necessary for the rapid advance of science.

If I say that the study of applied mathematics is pre-eminently fitted for the improvement of an acute and correct judgment, I only express a sentiment which, I am sure, is felt by each of my colleagues for his own subject. Where so many attempts are made, let us hope that one may have the desired effect.

UNIVERSITY AND EDUCATIONAL INTELLIGENCE

CAMBRIDGE.—The Smith's prizes were adjudged as follows:—The first to Mr. Herman, of Trinity College, the Senior Wrangler; the second to Mr. Yeo, of St. John's College, the Second Wrangler.

Mr. W. F. R. Welden, B.A., of St. John's College, has been nominated to study at the Zoological Station at Naples till June 1, 1882.

Among the subjects for which Downing College offers minor scholarships of from 40*l.* to 70*l.* per annum (examination June 6) are Chemistry, Physics, Physiology, Comparative Anatomy, and Botany. No candidate will be examined in more than three subjects, and two of them must be chosen from the first three named. Great weight will be given to special proficiency in one subject. The scholarships are open to non-collegiate students, or to those who have resided less than one term in any college. In June, also, the College offers one foundation Scholarship in Natural Science, open to all members of the University who have not kept more than six terms.

Prof. Stuart has been elected a Member of the Council of the Senate until November 7, 1884, in the place of Prof. Cayley, resigned.

The Burney prize for the present year is to be given for an essay on the following subject: "The Teleological argument for the existence of an intelligent and moral First Cause, as affected by recent Scientific Investigation."

Mr. MacAlister is lecturing at St. John's College on Methods of Physical Diagnosis for medical students beginning chemical work. Dr. Gaskell is lecturing on Respiration; Mr. Lea will lecture in March on Physiological Chemistry.

THE Chair of Agriculture at the Royal Agricultural College, Cirencester, vacant at the close of the present Session, has been offered to and accepted by Mr. Herbert J. Little, of Coldham Hall, Wisbeach.

SCIENTIFIC SERIALS

Journal of the Asiatic Society of Bengal, vol. 1. part 2, No. 4 (December 21, 1881), contains: W. T. Blanford, notes on an apparently undescribed species of *Varanus* from Tenasserim and notes on other reptiles and amphibia.—T. Wood-Mason and L. de Nicéville, second part of rhopaloceros lepidoptera from Port Blair, Andaman Islands, with descriptions and notes on new or little-known species and varieties (plate 14). This last adds twenty-two species to the fauna.—Geoffery Nevill, description of a new species of *Rostellaria* from the Bay of Bengal (*R. delicatula*).—W. T. Blanford, a numerical estimate of the species of animals, chiefly land and fresh-water, hitherto recorded from British India and its dependencies: Mammals 405, Birds 1681, Reptiles 514, Batrachia about 100, Fishes 1357, Mollusca land and fresh-water, about 1000, Coleoptera, 4780, Hymenoptera 850, Lepidoptera 4620, Hemiptera about 650, Neuroptera about 350, Diptera 500 (?) Orthoptera 350 (?) Arachnida 120, Myriapoda 50, Crustacea, land and fresh-water, 100. A glance at these figures and a comparison of them with the number of species known of the Arthropod orders in Europe will show Anglo-Indian naturalists how much there is yet to be done before the fauna of this great country approaches a complete enumeration.—J. Wood-Mason, on *Eurypus cinnamomeus*, a new species from North-East India (plate 4).

Annalen der Physik und Chemie, No. 1, 1882.—Determination of temperature-changes in expansion and contraction of metal wires, and the mechanical equivalent of heat, by H. Haga.—Discussions on the Fourier-Poisson theory of heat-conduction, by W. Hergesell.—On the relation of the freezing-point of salt-solutions to their laws of tension, by F. Koláček.—Remarks on Herr Wullner's note on the spectra of hydrogen and acetylene, by B. Hasselberg.—Fresnel's interference-phenomena treated theoretically and experimentally, by H. Struve.—On the

application of the telephone to determining the resistance of galvanic elements and batteries, by E. Less.—On the existence of a dielectric polarisation in electrolytes, by R. Colley.—On the differential pulley, by C. Bohn.—Theory of refraction on a geometrical basis, by A. Kerber.—On the electric resistance of gases, by E. Edlund.—Remarks on Herr F. Auerbach's second paper on magnetic reaction, by G. Wiedemann.—On an apparatus for representing the phenomena of geysers, by the same.—On the Wheatstone bridge, by K. F. Slotte.

Archives des Sciences Physiques et Naturelles, January, 1882.—Experimental researches on the action of poisons on molluscs, by E. Yung.—Memoir on the new registering barometer of the Meteorological Observatory of Lausanne, by H. Dufour and H. Amstein.—The landslip at Elm, by A. Heim.—Researches on the ethers of right tartaric acid, by A. Pictet.

Zeitschrift für wissenschaftliche Zoologie, vol. xxxvi., part 3 (December 30, 1881), contains:—Dr. G. Haller, on the structure of the Sarcoptidae (bird parasites—Dermaleichidae), plates 24 and 25.—W. Mau, on *Scoloplos armiger*, O.F.M., being a contribution to a knowledge of the anatomy and histology of the Annelids, plate 26 and 27.—Elias Metschnikoff, comparative anatomy studies:—(1) Entoderm formation in the Geryoniidae; (2) on some stages of the parasite of *Carmarina*, plate 28.—Dr. August Gruber, on *Dimorpha mutans*, a transition form (Mischform) between the Flagellates and Heliozoa, plate 29.—Dr. August Gruber, a contribution to a knowledge of the Amœba, plate 30.—Prof. Herbst, the natural history of the badger.—Prof. A. Bütschli, contribution to a knowledge of the skeleton of the Radiolarians, especially that of the Cyrtidae, plate 31-33.

Rivista Scientifico-Industriale, January 15.—On radiophony, by A. Volta.—Two specimens of tourmaline and beryl from Elba (with chromolithographs), and Elban microlite, by A. Corsi.—Insects in winter, by P. Bargagli.—A means of facilitating the preparation of some insects, by P. Stefanelli.

SOCIETIES AND ACADEMIES

LONDON

Royal Society, January 26.—"The Influence of Stress and Strain on the Action of Physical Forces." By Herbert Tomlinson, B.A. Communicated by Prof. W. Grylls Adams, M.A., F.R.S. Part II. Electrical Conductivity. (Abstract.)

The temporary alteration of electrical conductivity which can be produced by longitudinal traction was measured for all the metal wires used in Part I., both in the hard-drawn and annealed condition, and, in addition, for carbon and nickel.

The electrical resistances of all the substances which were examined, were, with the exception of nickel, increased by temporary longitudinal stress. With nickel, however, of which metal a wire nearly chemically pure was at length with difficulty procured (through the kindness of Messrs. Johnson, Matthey, and Co.), the resistance was found to *diminish* under longitudinal stress not carried beyond a certain point; but after this point had been attained, further stress began to increase the resistance. The effect on nickel appears still more remarkable when we reflect that the change of dimensions produced by the stress, namely, increase of length and diminution of section, would increase the resistance.

The specific resistances of all the substances, except nickel and aluminium, were increased by temporary longitudinal stress. With aluminium and nickel the specific resistances were *diminished* by stress not carried beyond a certain limit.

One of the most remarkable features discernible in the results is the similarity of the order of the metals to that of the order of "rotational coefficients" of metals recently given by Prof. Hall (*NATURE*, vol. xxiv, p. 46; abstract of a note read by Prof. E. H. Hall at the meeting of the British Association at York); indeed so striking is the relationship in the case of the metals iron, zinc, aluminium, and nickel, that there would appear to be no doubt that a series of experiments made with a view of determining the effects of mechanical stress and strain on the "rotational coefficients" would be of the greatest value.

Another point to be noticed is that the alteration of the specific resistances of the alloys brass, platinum-silver, and German-silver, is much less than that of the several constituents of these alloys, and at first sight there would appear to be some relation between the alteration of resistance caused by change of temperature and that due to mechanical stress; but it has been proved by these and other experiments that the increase of resistance caused by rise of temperature is in some cases one