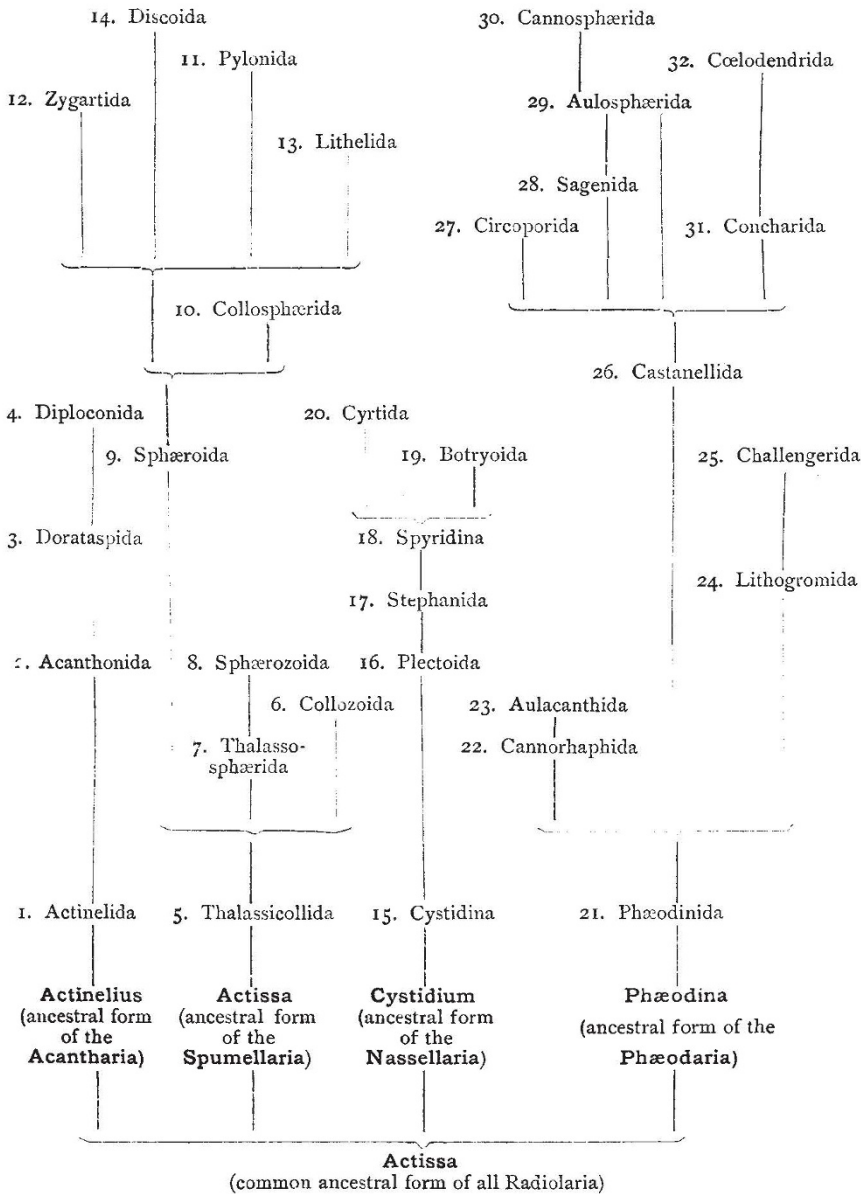


HYPOTHETICAL ANCESTRAL TREE OF THE RADIOLARIA (1882)



UNIVERSITY AND EDUCATIONAL INTELLIGENCE

OXFORD.—The following courses of lectures and instruction in Natural Science will be held during the present term. In the Department of Physics Prof. Clifton lectures on "The Distribution of Potential in a Circuit," and on the Galvanometer. Mr. Heaton lectures on Elementary Mechanics. Practical instruction in Physics is given daily by Prof. Clifton and Messrs. Heaton and Walker in the Clarendon Laboratory. At Christ Church Mr. Baynes lectures on the Kinetic Theory of Gases, and gives practical instruction in magnetic and electric measurements. At Balliol Mr. Dixon lectures on Elementary Heat and Light.

In the Chemical Department Prof. Odling continues his course on the Naphthalene Compounds. The Courses on Organic and Inorganic Chemistry are continued by Dr. Watts and Mr. Fisher. At Christ Church Mr. Vernon Harcourt has a class for Quantitative Analysis.

Prof. Story-Maskelyne continues his course on Crystallo-

graphy, and Prof. Prestwich concludes his course on Dynamical Geology, and lectures on Stratigraphical Geology.

In the Department of Morphology practical instruction is given by Prof. Moseley and Messrs. Robertson and Hickson on Human and Comparative Anatomy. Prof. Moseley lectures on the Comparative Anatomy of the Vertebrata, Mr. Hickson on the Elements of Animal Morphology, Mr. Jackson on Mimicry and Parasitism, Mr. Poulton on Descriptive Histology, Mr. Morgan on Odontography, and Mr. Barclay-Thompson on the Anatomy of Amphibia and Reptilia.

In the Department of Physiology (which is much cramped for room pending the erection of new buildings) Prof. Burdon Sanderson lectures on the Nervous System, while practical instruction is given by the Professor and Mr. Gotch on the Elementary Physiology of the Nervous System and of the Sense Organs, and by Mr. Dixey on Histology. At Magdalen Mr. Yule has a class for instruction in Practical Physiology.

The new Reader in Anthropology will give a course of six lectures on the Development of Civilisation and the Arts of Life.

Candidates for the Professorship of Botany are requested to send in their applications to the Registrar of the University on or before January 26. The stipend is 700*l.* a year, and a house rent free in the Botanic Garden.

New College offers an Exhibition in Natural Science (Chemistry or Biology). The examination commences May 6.

CAMBRIDGE.—The following are the principal courses in Natural Science during the present term:—

Mathematics.—Prof. Adams, Lunar Theory, commencing January 31; Mr. Turner (Under Plumian Professor), Instruction in the Use of Astronomical Instruments, January 30; Mr. Mollison, Vibrations and Sound, January 24; Mr. Stearn, Hydrodynamics, January 25; Mr. Hobson, Fourier's Series and Conduction of Heat, January 28; Mr. Thompson, Electromagnetism, January 25; Mr. Glazebrook, Wave Theory of Light, January 24; Mr. Ball, Algebra and Determinants, January 25; Dr. Besant, Analysis, January 23; Mr. Pendlebury, Analytical Optics, January 23.

Chemistry.—Prof. Liveing, General Course, January 24; Prof. Dewar, Organic Chemistry, January 28; Mr. Main, General Course, January 28; Mr. Pattison-Muir, Carbon Compounds, January 25; Non-Metals, January 26; Mr. Scott, Elementary Organic Chemistry, January 25; Mr. Lewis, Catechetical Lectures, January 25; Mr. Heycock, Chemical Philosophy.

Practical Chemistry.—Mr. Sell and Mr. Fenton, Demonstrations in Quantitative Analysis, January 25.

Physics.—Lord Rayleigh, Acoustics, January 26; Mr. Trotter, Electricity and Magnetism, January 24; Physical Optics, January 24; Mr. Atkinson, Heat, January 25; Mr. Glazebrook, Elementary Physics, January 25; Mr. Shaw, Elementary and Advanced Physics, Hydrostatics and Heat, January 25.

Mechanism.—Prof. Stuart, Theory of Structures, January 29; Mr. Lyon, Statics and Hydrostatics, January 29; Rigid Dynamics, January 30; Mr. Ames, Elementary Mathematics for Students of Mechanism, January 30.

Geology.—Principles of Geology and Stratigraphy (advanced), Prof. Hughes, January 24; Dynamical Geology, Mr. Roberts, January 24; Palæontology and Petrology, by Demonstrators, January 26.

Botany.—General Elementary Course, Mr. Vines, January 24; Anatomy of Plants, Mr. Gardiner, January 25; General Biology of Plants (advanced), Mr. F. Darwin, January 26; Morphological Botany, Mr. Hicks, January 26.

Zoology and Comparative Anatomy.—Geographical Distribution of the Vertebrata, by Prof. Newton, January 30; Elementary Biology, Mr. Vines and Mr. Sedgwick, January 25; Practical Morphology, Mr. Sedgwick, January 24; Morphology of Sauropsida, Mr. Gadow, January 23.

Biology.—Elementary, Mr. Vines and Mr. Sedgwick, January 25.

Anatomy and Physiology.—Osteology, Prof. Macalister, January 25; Physiology, Prof. Foster, January 24; Anatomy of the Digestive and Circulatory Organs, Prof. Macalister, January 24; Chemical Physiology, Mr. Lea, January 25; Physiology of the Circulation, Dr. Gaskell, January 24; Practical Work, Dissection, under the supervision of the Professor and Demonstrator, in the Dissecting Room.

SCIENTIFIC SERIALS

Bulletin de la Société des Naturalistes de Moscou, année 1883, No. 2.—Researches into the compounds of the acetylenes, by A. P. Sabanéeff. The author has studied these imperfectly known compounds, namely, di-brom-acetylene, and the double compounds of acetylene with bromine and chlorine, and with chlorine and iodine. He has discovered a new method of preparing larger quantities of the former by acting with zinc on an alcoholic solution of the four-brom-acetylene, and describes its various reactions.—On the periodical changes of level of the ocean, by H. Trauttschold (in German). The author, who already in 1869 supported the idea that the geological changes are due, not to the rise of the continents, but to the falling of the level of the ocean, finds in the disposition of the series of deposits of all ages up from the Silurian, on the plains of Russia, new and very interesting arguments for his idea. He maintains that the level of the ocean was falling from the Silurian epoch to the end of the Trias, when the seas had, around the now Russian plains, nearly the same shape as now.

The level of the ocean rose, however, during the Jurassic period, retiring again about the end of the Chalk period.—On the bastard of the *Anas cracca* with *Anas boschas*, by Dr. N. Sewertsoff, with a coloured plate (in German). The most interesting bastard of the nearly two extremes of the ducks (relatively to their size) has been shot in the province of Ryazan. The Russian ornithologist describes its features at length, and adds some remarks on the bastards of the ducks generally.—Monopetal plants of Radde, by Ferd. von Herden (continued).—Description (in German) of the Veronicas, Castillejas, *Siphonostegia*, *Philheiospermum*, and *Omphalotrix*.—A Mastodon tooth, note by H. Trauttschold.—On the photographic photometry of fixed stars, by Ed. Lindemann (in German).—Materials for the fauna of Hemiptera of Russia, by W. Yakovleff, being a description, in Russian, of several new species.

Rivista Scientifico-Industriale, October 31.—A detailed account of the electric exhibition held in September at Lodi, by Prof. Alessandro Volta.—Programme of the anthropological section of the Italian exhibition to be held next year in Turin. Amongst other attractions there will be a large collection of typical Italian skulls of all dates and from every part of the peninsula. Materials will also be brought together for studying the history, ethnography, language, and present condition of all the foreign communities (Albanian, Greek, Catalonian, Slav, German, Rumansch, French) settled in various parts of the country.

Rendiconti del R. Istituto Lombardo di Scienze e Lettere, November 29, 1883.—On Lagrange's general expression of the force necessary to produce a tautochronous motion regarded as a function of space and velocity, by Prof. C. Formenti.—Geological notes on the Alps of the provinces of Reggio and Modena, by D. Pantanelli.—On the first traces of a national debt in the Byzantine Empire, by Z. von Lingenthal.—Unimetalism and bimetalism, by Dr. A. Villa Pernice.—Meteorological observations in the Brera Observatory, Milan, during the month of September, 1883.

Nachrichten of the Royal Society of Sciences and of the University of Göttingen, August 22, 1883.—Contributions to the study of spermatozoa and their evolution (preliminary paper), by Dr. A. von Brunn.—Researches on the action of glycol on orthophenyldiamin, orthodinitrobenzine, and sulphuric acid.

November 7.—On the meteorological relations of Göttingen, by Hugo Meyer.—Optical researches on the substance (calcareous spath) into which crystals of aragonite become decomposed under the action of heat, by C. Klein.—On the age of the iron ores at Hohenkirchen, by A. von Koenen.—On the theory of modular equations, by A. Hurwitz.—On the relations between solar and atmospheric electricity, showing how the latter is referable to the former and allied causes.

SOCIETIES AND ACADEMIES

LONDON

Royal Society, November 22, 1883.—“Some Relations of Heat to Voltaic and Thermo-Electric Action of Metals in Electrolytes,” by G. Gore, F.R.S., LL.D.

The experiments described in this paper throw considerable light upon the real cause of the voltaic current. The results of them are contained in twenty tables; and by comparing them with each other, and also by means of additional experiments, the following general conclusions and chief facts were obtained.

When metals in liquids are heated, they are more frequently rendered positive than negative in the proportion of about 2·8 to 1·0; and whilst the proportion in weak solutions was about 2·29 to 1·0, in strong ones it was about 3·27 to 1·0, and this accords with their thermo-electric behaviour as metals alone. The thermo-electric order of metals in liquids was, with nearly every solution, whether strong or weak, widely different from the thermo-electric order of the same metals alone. A conclusion previously arrived at was also confirmed, viz. that the liquids in which the hot metal was thermo-electro-positive in the largest proportion of cases were those containing highly electro-positive bases, such as the alkali metals. The thermo-electric effect of gradually heating a metal in a liquid was sometimes different from that of suddenly heating it, and was occasionally attended by a reversal of the current.

Degree of strength of liquid greatly affected the thermo-electric order of metals. Increase of strength usually and con-