the northern coast of the Gulf of Finland, seven miles distant from the sea-shore) is explained by the increase of the rate of upheaval of the country towards the north. This old lake, like Lake Ladoga of our days, seems to have had but a poor fauna. Many smaller lakes which covered Esthonia, had a peculiar freshwater fauna. Gravel and sand, with *Ancylus fluviatilis*, like that found in Lake Baykal, and *Lymnæus ovatus*, as also *Neritina fluviatilis*, *Paludina impura*, *Unio*, and *Cyclas* are found at heights varying from 50 to 150 feet above the actual sea-level. On Œsel these deposits are widely spread, and descend to a level of 20 feet above the sea. At a still later period the lakes were filled with ooze, which constitutes now the so-called "marl of prairies" (*Wiesenmergel*) filled up with *Planorbis*, *Lymnæus*, &c., and containing also remains of man, together with bones of reindeer, as described by Prof. Grewingk.

In connection with this subject reference may be made to the conclusions arrived at as to the glacial formations by M. Nikitin, while making the geological survey within the limits of sheet 58 of the geological map of Russia, comprising Yaroslav and the eastern parts of Novgorod and Tver. The features of the Till, or Boulder-clay, which covers this region, are so much at variance with the theory of floating ice, which has been proposed to explain them, as well as with every other aqueous theory, and so much in conformity with the idea of a bottom moraine, that M. Nikitin has been compelled to admit the former extension of the northern ice-sheet of the Glacial period throughout the region of the Upper Volga (vol. ii. fasc. 3). The Boulder-clay of the Government of Poltava, sometimes 20 m. thick, consists of triturated, unstratified materials, partly derived from sources within the region itself, and partly brought from the north. It contains scratched boulders, and though undoubtedly of glacial origin, its precise mode of formation still remains in dispute, notwithstanding the careful attention given to the study of the question by M. Armashevsky (vol. ii. fasc. 6).

UNIVERSITY AND EDUCATIONAL INTELLIGENCE

CAMBRIDGE.—The Natural Sciences Tripos, Part I., commenced on May 17; Part II. will commence on May 29.

The examiners in the Mathematical Tripos of 1883-84 have reported that the work done in Part II. was on the whole disappointing, and inferior to that usually done in the old "five-days" examination. They suggest that this may be due to its taking place in the Easter Term, in which revision of subjects is usually much interrupted. In Part III. eleven candidates presented themselves, of whom seven were placed in the first division. The work was extremely good, the candidates having judiciously specialised their reading.

SCIENTIFIC SERIALS

Bulletin de l'Académie Royale de Belgique, February 2.—On the crepuscular phenomena of the months of November and December 1883, by F. Terby.—On the physiological action of aspidospermine (bark of *Aspidosperma quebracho*), by Dr. Closson.—Remarks on some Sanskrit verbal roots of the eighth class, by J. van den Gheyn.—Contributions to the biography of the portrait painter A. de Vries, and of the Flemish painter Theodore van Loon, by Auguste Castan.—Biographical notice of the Dutch painter Marin van Romerswael, by Henry Hymans.

March 1.—Note on the Pons-Brooks comet 1812, observed at Louvain during the winter of 1883-84, by F. Terby, and at Brussels by L. Niesten.—On an empirical relation between the coefficient of internal friction of liquids, and its variations under changes of temperature, by P. de Heen.—Preliminary communication on the anatomy of the Acarians, a group of Arachnidæ, by J. MacLeod.—On the changes of refrangibility in the electrical spectra of hydrogen and magnesium, by Ch. Fievez.

Journal of the Russian Chemical and Physical Society, vol. xvi. fasc. 1.—The dilatation of liquids, by D. Mendeléeff.—On the tension of vapour of solutions, by D. Konovaloff. The author has resorted in his measurements to a method much like that of Magnus, and gives the results of his measurements (illustrated by curves) for mixtures of water with alcohols and acids: formic, acetic, propionic, and butyric; they are followed by a discussion on the distillation of solutions, on mixtures, and on the solubility of liquids.—On an acoustic instrument for measuring the number of vibrations, by A. Izraïleff.—New demonstrations of the conditions of minimum of deviation of a ray by the prism, by K. Kraevitch. In most treatises on physics this demonstration is made by means of methods more or less artificial, excepting the treatise of Jamin, who has resorted to differential calculus. However long, M. Kraevitch's demonstration is very simple, and is deduced very naturally out of the fundamental laws of refraction.—On the friction of well lubricated bodies, by N. Petroff.

SOCIETIES AND ACADEMIES

LONDON

Royal Society, May 8.—"On a Relation between the Coefficient of the Thomson Effect and certain other Physical Properties of Metals." By Shelford Bidwell, M.A., LL.B.

Having observed that the coefficient of the Thomson effect is generally positive in those metals which have a great specific resistance and specific heat, and negative in those which are distinguished by a great coefficient of expansion, the author endeavoured to find an empirical formula expressing the coefficient of the Thomson effect in terms of the specific resistance, specific heat, and coefficient of expansion. Though he was not altogether successful, he believes that the subjoined table points to a close relation between them.

I. Metals	II. Coefficient of Thomson effect.	III. $H \times R - E^2$	IV. Last column divided by 2400
Ni	5·12	12320	5·13
Fe	4·87	9918	4·13
Pd	3·59	7086	2·95
Pt (soft)	1·10	2309	0·96
Pt (hard)	0·75	—	—
Mg	0·95	1384	0·58
Pb	0	− 604	−0·25
Al	−0·39	1942	0·81
Sn	−0·55	− 868	−0·36
Cu	−0·95	−1137	−0·47
Au	−1·02	−1172	−0·49
Ag	−1·50	−2246	−0·94
Zn	−2·40	−2355	−0·98
Cd	−4·29	−4958	−2·07

The first column contains the names of the metals, except alloys, given in Tait's thermo-electric diagram (*Trans. R.S.E.*, vol. xxvii. p. 125). The second column gives the coefficients of the Thomson effect: these are taken from Everett's table ("Units and Physical Constants," p. 151), which is based upon Tait's diagram.

H, R, and E being numbers proportional to the specific heats, specific resistances, and coefficients of expansion of the various metals, $H \times R - E^2$ gives the numbers in the third column of the table. $H =$ specific heat $\times 10^3$, $R =$ specific resistance $\times 10^3$, $E =$ coefficient of expansion $\times 10^8 \div 34$. The multipliers 10^3 and 10^8 were used merely for the convenience of getting rid of decimals; the divisor, 34, was so chosen that while the ratio of the first number to the last in Column III. should be as nearly as possible equal to the ratio of the first number to the last in Column II., the number corresponding to lead in Column III. should at the same time be as near zero as possible. Both conditions could not be exactly fulfilled at once. The authorities for the specific heats, specific resistances, and coefficients of expansion are given in the paper.

Column IV. gives the numbers in Column III. divided by 2400, to facilitate comparison with Column I.

It will be seen that with one exception the order o f magnitude of the numbers in Column IV. is exactly the same as the order of those in Column II. The rate of decrease is not, however, the same, the numbers diminishing too rapidly in the upper half of Column IV., and too slowly in the lower half.[1]

[1] With regard to aluminium it is suggested that Matthiessen's determination of the specific resistance, 0·029, is possibly too high. Moreover the author found experimentally that the Thomson coefficient of the specimen of aluminium which he used was slightly + instead of −, as given in Column II.; it is also shown as + in the diagram at p. 178 of Jenkin's "Electricity." If its specific resistance were as high as 0·026, it would come between magnesium and lead in Column IV.