

quartz, which was broken off the large piece, revealed two patches of gold, both of which together, if removed from the matrix, would probably produce about a dwt. (pennyweight) of the metal; whilst several small masses or nuggets were found adhering to the small broken fragments of quartz at the bottom of the pail in which the rock was washed, the largest of which contained about ten or twelve grains of gold. From some specimens in which no gold was perceptible to the naked eye, and had been selected for analysis, a small nugget weighing three grains was obtained in the dust of the bag in which the specimens were carried. In the specimen from Fox Hill the metal occurs thickly in the minutest specks, scarcely, if at all, perceptible to the naked eye, but readily recognised under the lens, where it chiefly surrounds a small patch of chlorite.

The rock formation intersected by these auriferous quartz veins is of Huronian or Intermediate age, or the group of strata next below the *aspidella* slates of St. John's. The group consists chiefly of greenish fine-grained felsite slates, which, judging by the weathering of the exposed surfaces, are also magnesian and ferruginous. The cleavage is exactly coincident with the bedding, and the slates occasionally split into very fine laminae, but frequently into strong stout slabs, which are used to a considerable extent at Brigus for paving, for hearthstones, and for building foundations and walls.

A rough and hummocky belt of country from three-quarters to one mile wide, which forms the nucleus of the peninsula between Bay-de-Grave and Brigus Harbour, is thickly intersected by reticulating quartz veins varying in thickness from less than an inch to upwards of a foot, which often appear to ramify from a central boss or great mass of quartz, often extending over many square yards, and usually forming low isolated hummocks or hills. The general run of the belt is as nearly as possible north-east and south-west from the true meridian. Although many of the veins, both small and large, may be seen for considerable distances to run exactly parallel with the bedding, the net-work of the whole mass runs obliquely to the strike of the beds, which are also minutely intersected by the smaller veins crossing and reticulating in all directions.

The resemblance in general character of the strata with their included auriferous quartz veins in Newfoundland to those of Nova Scotia is striking, although according to Dr. Dawson the auriferous country of Nova Scotia is probably of Lower Silurian age, while that of Newfoundland is undoubtedly unconformably below the Primordial group, which, with abundant characteristic fossils, skirts the shores of Conception Bay.

That a large area of country in the regions referred to is auriferous there can scarcely be a doubt, although nothing short of actual mining and practical experience can possibly prove what the value of the produce may be, or whether the prospects of obtaining a remunerative return for the necessary outlay are favourable or otherwise. The specimens which have been obtained, although an unquestionable evidence of the presence of the precious metal, cannot by any means be taken as indicative of a certain average yield. An analysis of quartz collected, in which gold is imperceptible to the naked eye, may aid in revealing some evidence of its constancy, and may throw some light upon the possible average of superficial contents over certain areas under similar circumstances; but it may safely be predicted that the irregularities of distribution, so conspicuously displayed by the veins on the surface, will extend beneath it, and that it will be mainly on the stronger and more persistent bands, where intercalated with the strata, that mining will extend to any considerable depth.

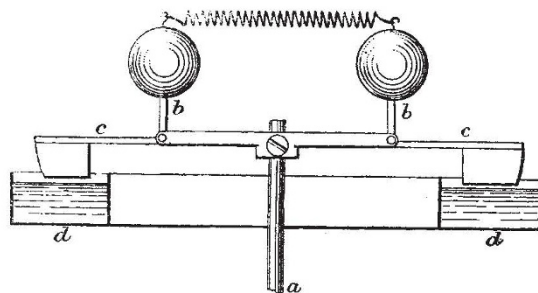
The indications of gold in Newfoundland are certainly sufficiently favourable to merit a fair trial; and there are good reasons to hope and expect that ample capital applied to skilled and judicious labour may be found remunerative to future adventurers, while a new industry will be added to give employment to the labouring population of the island, and possibly bring this despised and but little-known colony into more prominence and consideration abroad than it hitherto has enjoyed.

A SPEED GOVERNOR FOR CONTINUOUS MOTION

IN NATURE, vol. xxiii, p. 61, a speed governor for a chronograph is described, the invention of the Astronomer-Royal, in which a conical pendulum acts on a paddle moving in a viscous fluid, so as to make it dip more deeply into the fluid when the speed is increased. A similar apparatus, with a spring instead of

a pendulum, has recently been applied by me to a clock driving a recording seismograph whose motion is required to be continuous and fairly uniform. As the apparatus is very simple and easily made, requiring no nice fitting, and has proved itself to be a very effective governor, a description of it may perhaps be useful.

a is a vertical spindle driven by the clock, and making about one turn per second. Near the top of it a cross-bar is fixed, whose ends are forked, and in them are jointed two bell-crank levers *b c*, *b c*. At the top of *b b* are two masses, which in my instrument are two smooth-bore musket balls. These are tied together by a spiral spring between two hooks at the top. At the ends of *c c* are two flat paddles, and when the balls fly out from the axis of rotation the paddles dip into glycerine contained in the annular trough *d d*, which is shown in section. The trough rests on the top of the clock frame. By using only one spring, instead of tying each ball to the spindle by a separate spring, I secure that the pull inwards is necessarily the same for both.



As the balls go out a component of their weight comes into action, helping this motion and opposed to the pull of the spring. For small displacements this force increases very nearly in proportion to the displacement, and hence, by choosing a spring of suitable stiffness, a small change of speed can be made to produce a relatively very large displacement, the proper condition for approximate isochronism.

A governor whose actual size is about twice that of the sketch, roughly made in my laboratory, gives only a slight rise in speed when the driving weight is doubled, and works very smoothly. The apparatus can easily be applied to a clock, perhaps most easily by rolling contact between a horizontal disk on *a* and a vertical disk on one of the axles of the clock, and it gives sufficient control for many purposes. If great accuracy were required the resultant effect of change of temperature on the elasticity of the spring and on the viscosity of the fluid might be corrected by making *c* of two metals, so as to bend and raise or lower the paddles. It is well to put stops to prevent the balls from falling inwards beyond the vertical position.

J. A. EWING

The University, Tokio, Japan, January 21

UNIVERSITY AND EDUCATIONAL INTELLIGENCE

OXFORD.—The electors to the Radcliffe Travelling Fellowship have, after examination, awarded the Fellowship to Mr. A. J. Anderson, B.A., late Natural Science Demy of Magdalen College.

The examiners for the Burdett-Coutts (Geological) Scholarship have recommended Mr. J. B. Nias, B.A., scholar of Exeter College, for the scholarship.

The Junior Studentships in Natural Science at Christchurch have been awarded to Mr. G. C. Chambres, Commoner of Balliol College, and late of Dulwich School, and to Mr. R. E. Moyle (private tuition). *Proxime accessit*, Mr. C. D. Spencer, of Clifton College. Mr. W. C. Hudson was elected to an Exhibition in Natural Science.

The various lecturers and demonstrators in physics met last week at the instance of Prof. Clifton, and arranged a scheme of lectures for next term, similar to that carried out during the present term. The object of the scheme is to divide the subjects among the independent college and university lecturers, so that students may attend, by going from one lecturer to another, all the lectures required for any particular course of study.

THE annual meeting of the Governors of the City and Guilds of London Institute for the Advancement of Technical Educa-

tion was held on Monday at the Mercers' Hall, Sir S. Waterlow, M.P., one of the vice-presidents, in the chair. The most important points referred to in the report were the course taken in reference to the plans and estimates for the central institution, the settlement of the plans for the Technical College, and the technological examinations. With regard to the central institution the Board thought it ought not to authorise the entering into any contract beyond that for which they had the money in hand. The Chairman earnestly hoped that some of the companies that had not yet contributed would subscribe and enable the 20,000*l.* which was yet required to be made up. With reference to the Technical College at Finsbury there was no reason why the foundation-stone of the building should not be laid at an early date. He was glad to be able to state that the Drapers' Company had announced its intention of increasing its subscriptions from 2000*l.* to 4000*l.* per annum, the additional sum to be applied for the first two years towards the cost of building and fitting the Finsbury Technical College. The Vintners' Company had likewise signified its intention of contributing 250*l.* per annum, which showed its sympathy in the work. During the past year the income had been 13,549*l.*, and by the subscriptions received it was raised to 20,765*l.* for the year 1881. The chairman concluded by moving the adoption of the report. Mr. W. Spottiswoode seconded the motion, which was unanimously carried.

At a meeting held at 68, Grosvenor Street, W., on February 18, Mr. George Palmer, M.P., in the chair, it was decided to raise a fund for the purpose of founding an annual prize or scholarship for mathematics in memory of Miss Ellen Watson, to be open for competition equally by men and women, at either University College or the London University. Miss Watson was the first woman to enter the classes of mathematics at University College, London. Her success as a student of mathematics was brilliant, and at the end of the session, in June, 1877, she gained the Mayer de Rothschild Exhibition, which is awarded annually to the most distinguished mathematical student of the year. After passing the 1st B.Sc. examination at the London University, in July, 1879, Miss Watson was obliged by failing health to leave England for Grahamstown, South Africa, where she died last December, aged twenty-four years. It may be added that the Ellen Watson scholarship, or prize, would be the first that has been founded in memory of a woman's mathematical genius and promise of scientific work. A second meeting to determine to which of the above institutions the scholarship should be offered, and to arrange other matters in connection with it, was held yesterday. Subscriptions will be gladly received and may be paid to Miss Alice M. Palmer, hon. sec., 68, Grosvenor Street, W., or to the account of the "Ellen Watson Fund," Messrs. Dimsdale and Co., Bankers, Cornhill, E.C.

PRINCE LEOPOLD will formally open the new University buildings at Nottingham on Thursday, June 30.

At a meeting of the Council of the Wilts and Hants Agricultural College, at Downton, Salisbury, on Wednesday, it was unanimously resolved that the College should henceforth be called the College of Agriculture.

SCIENTIFIC SERIALS

Annalen der Physik und Chemie, No. 2.—On absorption of carbonic acid by wood charcoal, and its relation to pressure and temperature, by P. Chappuis.—On absorption of dark heat-rays in gases and vapours, by E. Lecher and J. Pernter.—New researches on Newton's rings (continued), by L. Sohncke and A. Wangerin.—On the discharge of electricity in rarefied gases (continued), by E. Goldstein.—On the question as to the nature of galvanic polarisation, by F. Exner.—On the same, by W. Beetz.—On excitation of electricity on contact of metals and gases, by F. Schulze-Berge.—Note on F. Exner's paper on the theory of Volta's fundamental experiment, by the same.

Bulletin de l'Academie Royale des Sciences (de Belgique), No. 1.—Geodetic junction of Spain and Algeria in 1879, by M. Perrier.—Fire-damp and atmospheric perturbations, by M. Cornet.—On the excretory apparatus of rhabdocelan and dendrocelan Turbellaria, by M. Fancotte.

Reale Istituto Lombardo di Scienze e Lettere, Rendiconti, vol. xiv., fasc. i. and ii.—Synoptic tables of results obtained in the Botanical Garden of Pavia University from cultivation of fifteen qualities of vine (Asiatic and American species and varieties), by S. Giacomo.—Contribution to the pathology of

voluntary muscles, by C. Golgi.—Contribution to the physiology of strychnic tetanus, by G. Ciniselli.—On Cremonian correspondences in the plane and in space, by C. F. Archieri.—The invasion by the *Peronospora viticola* in Italy, by S. Garovaglio.—On the damage which *Peronospora* may do in Italy in future, by V. Trevisan.—Statistical note on inflammation, on cancer, on cirrhosis, on tuberculosis, and on pyæmia, by G. Sangalli.—Proposed classification of the stature of the human body, by S. Zoja.

Atti della R. Accademia dei Lincei, vol. v. fasc. 2 (December 18, 1880).—Reports on prize competitions.

Fasc. 3 (January 2).—Contributions to the study of medullated nerve fibre and observations on amylose corpuscles in the brain and spinal cord, by A. Ceci.—On the bacillus of contagious mollusca, by M. Domenico.—On an equation between the partial derivatives of the inverse distances of three planets which attract one another, by Dr. G. Annibale.—Two small fossil hymenoptera of Sicilian amber, by G. Mulfatti.—On some rare species of Italian birds, by P. Luigi.—On Stilbite from Miage (Monte Bianco), by C. Alfonso.—On ollenite, an amphibolic rock of Mount Ollen, by the same.

Rivista Scientifico-Industriale, No. 2, January 31.—Coglievina's centigrade photometer, by R. Ferrini.

Memoirs of the St. Petersburg Society of Naturalists.—The last volume of the *Memoirs* of the St. Petersburg Society of Naturalists contains, besides the minutes of meetings of the Society, a most interesting paper by Prof. Kessler, on the "Law of Mutual Help," or sociability, which he proves to be the necessary complement of Darwin's law of the struggle for existence.—Ornithological observations in Transcaucasia, by M. Mikhailovsky.—Observations on the motions of diatomaceæ and their causes, by M. K. Merejkovsky.—Materials for the knowledge of the infusorial fauna of the Black Sea, by the same author.—A sketch of the flora of the province of Toula, by MM. D. Kojevnikoff and W. Tzinger, with a map.—Figures showing the quantities of gases in the blood and the quantities of urea and urine secreted by man under various conditions of life, by M. Shitz; and a paper on Medusæ, by M. K. Merejkovsky.

SOCIETIES AND ACADEMIES

LONDON

Royal Society, February 3.—Dr. Klein communicated a paper by John Haycraft, Senior Physiological Demonstrator in the University of Edinburgh, on the cause of the striation of voluntary muscular fibre. The author showed that all the cross striæ observed are due not to any differences of structure along the fibre, but simply to the shape of the fibre itself. The fibre is not a smooth cylinder, but is ampullated, alternate ridges and depressions occurring with beautiful regularity across its length. The striæ correspond with these in position, and are caused by their action on the transmitted light. He showed theoretically how this must be so, and illustrated it with a model of the same shape but of uniform structure, which exhibited down to the minutest detail the cross striæ seen in the muscle itself. He then showed the true explanation of the action of staining agents and of polarised light.

Mathematical Society, March 10.—S. Roberts, F.R.S., president, in the chair.—Prof. Cayley read a paper on the equilibrium and flexure of a skew surface.—Mr. Tucker communicated portions of papers, viz. :—An application of elliptic functions to the nodal cubic, by Mr. R. A. Roberts; and note on Prof. C. S. Peirce's probability notation of 1867, by Mr. H. McColl.—Mr. J. W. L. Glaisher, F.R.S. (vice-president), having taken the chair, the president communicated the following direct analogue in space of the well-known plane theorem, "If we take an arbitrary point on each side of a triangle and describe a circle through each vertex and the two points on adjacent sides, the three circles meet in a point," viz. if we take an arbitrary point on each edge of a tetrahedron and describe a sphere through each vertex and the three points on adjacent edges, the four spheres meet in a point. The analogue was used as a point of departure for the study of four spheres meeting in a point.

Chemical Society, March 3.—Prof. Roscoe, president, in the chair.—The following papers were read:—On the action of Bacteria on various gases, by F. Hatton. An aqueous extract of flesh was used as the source of the Bacteria-containing liquid. A small flask half full of this liquid and half full of