

attention was turned to the cultivation of the soil. Round the huts, accordingly, were patches of land in potatoes, turnips, and cabbage, which at least this year yielded abundant crops, though the colony is situated in the latitude of Avaxa, that is to say, under the Arctic circle.

Later in the day we came to the Monastery of Troit, in former times renowned and rich, now inhabited only by a single monk, viz., the prior himself. He was a worthy old man, who gave us a hospitable and friendly reception. The apartment for the reception of guests was adorned with a number of portraits of Siberian bishops. There was besides a portrait of a Russian Czar in powdered hair and military uniform, with blue great cross riband. It was a portrait of Czar Paul, but through some exchange the Skoptists had taken it into their heads that the portrait represented their holy prophet, Czar Peter III., whose history they had completely altered in accordance with their idealised conception of the world. An educated man, who belonged to this sect, and on this account had been banished to North Jenisei, informed me accordingly in all seriousness that Czar Peter III. was not murdered, but was knouted and sent to Siberia, &c., all on account of his holiness—as so it happens now that in consequence of all this the portrait of Czar Paul in the Troit Monastery is a sacred picture to which worship is offered.

A. E. NORDENSKJÖLD

(To be continued.)

SCIENTIFIC SERIALS

THE *Journal of the Chemical Society* for December 1875 contains the following papers communicated to the Society:—On the agricultural chemistry of the tea-plantations of India, by J. Campbell-Brown, D.Sc. This lengthy paper contains analyses of the young and old leaves of good plants and of stunted and blighted plants of different varieties, analyses of the wood of good and stunted tea-plants of different varieties, analyses of tea-seed, of the soils of tea-plantations, and of tea from manured and unmanured plants. The author discusses also the analytical results.—On certain new reactions of tungsten, by Prof. J. W. Mallett, of the University of Virginia. The author has found, contrary to the statements in text-books, that the precipitate produced by hydrochloric acid in a solution of an alkaline tungstate is soluble in an excess of the concentrated acid. By adding fragments of metallic zinc to the above-named acid solution, various colours are produced, the most noteworthy being a brilliant magenta. Potassium sulphocyanate and metallic zinc added to the acid solution produce a rich green colour, but when the sulphocyanate is added first to the alkaline tungstate solution, then a considerable quantity of water, then hydrochloric acid, and finally zinc, a fine amethyst colour is produced. The blue colour well known as characteristic of one of the lower oxides of tungsten may be best brought out by the use of hyposulphurous acid (H_2SO_3) as the reducing agent.—The remainder of the journal contains the usual collection of abstracts.

American Journal of Science and Arts, Dec. 1875.—This number commences with a paper of careful observations by Prof. Dana on five of the river valleys of Southern New England, with a view to ascertaining the depression of that region during the melting of the glacier. This he estimates at about 15 feet. He considers that the terraces in the Housatonic, Connecticut, and Thames, which are now so high above the river's surface, were not wholly, or mostly formed when the land was at a much lower level then now, but they were formed when the rivers were at a greatly higher level than now, owing chiefly to the glacial flood. Thus we may have high and numerous terraces along valleys, and yet none be due to an elevation of the land. The height of the streams during the flood above high tide level is estimated in one case at as much as 237 feet (from which the 15 feet depression would be deducted). The amount of depression increased from the south northwards at about one foot and a half per mile, since Dawson has shown that the height of the beaches at Montreal indicate a depression there of 500 feet. The waters from the melting glacier must have brought down the streams in vast volume to have piled to so great heights before outlets so wide and deep.—Prof. Storer, of Harvard, gives some observations which show (after Schönbein) that ammonia is a constant contaminant of sulphuric acid, and further, that it is a more frequent impurity in chemical substances (prepared with aid of sulphuric acid) than has been supposed.—An abstract is given of a memoir by Prof. Suess of Vienna on the origin of the

Alps.—Mr. Andrews describes some new and interesting coal-plants from Perry County, Ohio, and Dr. Becker calls attention to a new feature in the "Comstock Lode" in Nevada.—In a letter from Dr. Gould, of Cordoba Observatory, the writer states that his zone observations, begun in 1872, are now completed; and the entire region from 23° to 80° of south declination has been carefully scrutinised. The 10° round the pole have been examined by Gillis at Santiago and Stone at Cape of Good Hope, and Gould's northern limit overlaps Argeländer's southern zone by eight degrees (as Argeländer had requested).

Supplementary December Number.—Mr. Langley here contributes a paper on the solar atmosphere, being introductory to an account of researches made at the Alleghany Observatory. The estimates of the absorptive power of this atmosphere, based on photometric comparison of the centre and edge of the sun, have been widely discrepant; thus Arago thought the light of the centre must be diminished 2/4 per cent. to equal that of the edge; Liais's estimate is 10 and Secchi's 73 per cent. Mr. Langley here describes a new method of measurement free from some of the objections to previous ones; and he thinks the estimates of Secchi (who used La Place's formula) are certainly in excess of the truth. Not much more or less than one half (he considers) of the whole so-called "luminous heat rays" are absorbed, turned back, or converted into work, in the sun's atmosphere. The total thermal absorption is somewhat less. The method is also applicable to sun-spots, &c., and Mr. Langley finds the absolute light of the "nuclei" in spots at least five thousand times that of the full moon.—In a supplemental paper on Southern New England during the melting of the great glacier, Prof. Dana discusses the overflows of the flooded Connecticut, which he concludes was at that time a great stream 150 feet deep and fifteen miles wide.

SOCIETIES AND ACADEMIES

LONDON

Royal Society, Jan 6.—On the length of the Spark from a Battery of 600, 1,200, 1,800, and 2400 rod-Chloride of Silver, and some Phenomena attending the Discharge of 5,640 Cells. By Warren De La Rue, D.C.L., F.R.S., and Hugo W. Muller, F.R.S.

On the 24th February, 1875,* we had the honour of communicating to the Society, in conjunction with our friend Mr. Spottiswoode, an account of some experiments to ascertain the cause of stratification in electrical discharges *in vacuo*. These experiments were made with a battery of 1,080 cells of powder-chloride of silver, which was described; we have now in action 3,240 such cells, and have recently completed 2,400 rod-chloride of silver cells,† making our total force 5,640 cells in action. To these will be shortly added another unit of 1,080 cells powder-chloride, and two other units of 1,200 rod-chloride, making a total of 9,120 cells.

We have more recently made a verbal communication to the Society of Telegraph Engineers, and also in October last a written one to the Académie des Sciences of Paris‡, wherein we have stated that the length of the spark in air appears to be in the direct ratio of the square of the number of cells.

Having completed the 2,400 cells, and charged them up in a single day, they were exactly in the same condition as to electro-motive force and internal resistance, consequently they afforded the means of testing the truth of the law of the length of spark in a manner more efficacious than had hitherto obtained, the more especially as by the use of paraffin corks and other precautions we had obtained an excellent insulation.

Our assistant, Mr. Fram, has constructed a discharger which permits of the accurate measurement of the distance of the terminals to read to $\frac{1}{1000}$ of an inch, and by estimation to the tenth of that quantity. The nut, through which the screw ($\frac{1}{16}$ of an inch), carrying one of the terminals, works, is divided into two parts, which are separated by a spiral pressure-spring, so as to prevent shake. In making measurements the terminals are separated to a greater quantity than the anticipated striking-distance, and gradually approached until the spark passes; the discharger is then detached from the battery, and after reading the scale, connected up with a separate battery of 10 cells, with a detector-galvanometer in circuit. The terminals are again approached until the motion of the galvanometer indicates contact between

* Proc. Roy. Soc., No. 160, 1875.

† Proc. Roy. Soc., No. 160, 1875, p. 357.

‡ "Comptus Rendus," No. 16, p. 686; No. 17, p. 746, 1875.