

more interesting. On p. 27 we notice a curious statement. No. 61 to No. 85, says the catalogue, are works published by the University of Tokio. "As English translations accompany many of them, the visitor will be able to gather at once what they treat of," in other words, it is implied that the works were originally written in Japanese, and were afterwards translated into English. This is wholly incorrect; the works which are spoken of as "translations" are the originals, and were written by European gentlemen (whose names, by the way, are suppressed) in the educational department of Japan. Most of them were noticed at the times of their appearance in our own columns. They are all works of high scientific value, and their publication reflects much credit on the University, but, if any remark were necessary at all, it should have been that the Japanese was the translation, and the English the original, and not as stated in the catalogue. Exhibits 86 to 103 are the theses of the students in chemistry presented on graduation, and here the writer's name is in every case given. These papers are no doubt creditable in their way; still they are only the ordinary work of good students, while the others approach in many cases to the dignity of considerable volumes, and represent much labour and knowledge. Yet here the authors' names are withheld, and they are actually spoken of as translations. The writers were men whose names will long be connected with Japanese educational advancement—Messrs. Morse, Knipping, Korschelt, Ewing, and others—and the Commissioner can hardly have been ashamed to have their names in his catalogue, for all who know anything of Japanese education know how much science in Japan is indebted to the labours of these and others like them. Probably quite unintentionally there is not only the *suppressio veri* but also the *suggestio falsi* in the catalogue under this head.

At the Working Women's College the opening address for the year to students and friends will be delivered in the Maurice Hall of the College, 7, Fitzroy Street, W., to-morrow (Friday) night at 8 p.m., by Mr. George Macdonald. Those interested in the work of the College are invited to be present.

MESSRS. LONGMANS AND CO. announce the following publications as forthcoming:—"Louis Pasteur, his Life and Labours," by his Son-in-Law; translated from the French by Lady Claud Hamilton. "The Science of Agriculture," by F. J. Lloyd. "Custom and Myth; Studies of Early Usage and Belief," by Andrew Lang, M.A. "A Manual of Telegraphy," by William Williams, Permanent Assistant to the Director-General of Telegraphs in India. "Above the Snow Line: Mountaineering Sketches between 1870 and 1880," by Clinton Dent, Vice-President of the Alpine Club.

WE have to record the death of M. Bourdon, the inventor of the metallic barometer and manometer which are so largely used.

IN the report last week of the paper read by Prof. Ramsay and Mr. Sydney Young before the Chemical Section of the British Association, "On Evaporation and Dissociation" (p. 551), in the sentence "as the dissociation *increases* the curves approach, &c.," "increases" should be "decreases." In Mr. Nicols's letter on "Salmon-Breeding" (September 25, p. 513, col. 1, line 13 from top), *parrs* should be *pairs*.

THE additions to the Zoological Society's Gardens during the past week include a Lesser White-nosed Monkey (*Cercopithecus pe'aurista* ♂) from West Africa, presented by Miss Ethel A. Hut'ou; a Bonnet Monkey (*Macacus sinicus* ♀) from India, presented by Mr. W. Phillips; two Great Bats (*Vespertilio noctula*), British, presented by Capt. W. St. George Ord; a Horned Lizard (*Phrynosoma cornutum*) from Texas, presented by Mrs. S. Russell; an Erxleben's Monkey (*Cercopithecus erxlebeni* ♀) from West Africa, a Common Marmoset (*Hapale jacchus*), a Black-eared Marmoset (*Hapale penicillata*) from South-East

Brazil, a Pig-tailed Monkey (*Macacus nemestrinus* ♀) from Java, two Small Hill-Mynahs (*Gracula religiosa*) from Southern India, a Blue-bearded Jay (*Cyanocorax cyanopogon*) from Para, an Alligator (*Alligator mississippiensis*) from the Mississippi, deposited.

PHYSICAL NOTES

M. GARBE has laid down the two following laws in connection with Lipmann's capillary electrometer:—(1) The capillarity constant of mercury is greatest when the electrical difference at the meniscus is *nil*, and, as a rule, its value is independent of the sign of this difference. (2) The electrical capacity at a constant surface of an electrode plunged in a liquid is purely a function of the electrical difference, independent of the sign of that difference, and is least when that difference is *nil*.

M. BEETZ has made a standard cell which is a modified form of Latimer Clark's mercurous sulphate cell. It consists of a tube in which a compressed cake of mercurous and zinc sulphates is placed; at one end of the cake the zinc pole is placed, and at the other end the mercury pole. On short-circuiting the following results were obtained:—

| | | | |
|---------------|-------------|-------------|-------------|
| 5 minutes ... | 1'440 volts | 6 hours ... | 1'437 volts |
| 1 hour ... | 1'439 " | 12 " | 1'434 " |
| 4 hours ... | 1'439 " | 48 " | 1'408 " |

The resistance was 15'700 ohms.

M. DECHARME has made some experiments comparing a drop of water falling on to a surface of glass, which he had covered with a thin layer of minium so as to preserve forms obtained, with a rifle bullet striking a target. He found a striking analogy in the results.

M. FOUSSEREAU has found the specific resistance of distilled water, in the same apparatus, to vary from 118,900 to 712,500 ohms, that is to say, in the ratio of 1 to 6. He accounts for this in three ways: (1) by the solution of the surface of the containing vessel; (2) by the solution of matter from the air; (3) to the effect of the dissolved matter during distillation. On the first point he found that at 15° C. after standing in a glass vessel for forty-eight hours the resistance fell 1/30. At 30° C. the change was more rapid, and at 75° C. the resistance varied, so that he was unable to make any measurements. The solution of gases from the air had only a small effect. On the third point great care was observed. Experiment proved that the addition of 1/1,000,000 of potassium chloride reduced the resistance 1/3; according to M. Bouty, hydrochloric acid is five or six times as powerful. In respect to ice, M. FousserEAU found that at the moment of congelation the resistance increased nearly 15,000 times, and continued to increase as the temperature fell. Thus ice at -1° C. has a specific resistance of 4865 megohms, and at -17° C. 53,540 megohms. A sample of ordinary water gave 65 times the conducting power, whilst the ice from it was from 30 to 40 times as conducting.

HERR WARBURG has succeeded in electrolysing glass; the method that he adopted is as follows:—He heated a piece of soda lime glass to about 300° C.—at which temperature it is a conductor—and placed it between mercury electrodes. It was necessary to use from 15 to 30 Bunsen cells for a long period. He then found that at the anode side of the glass he had a layer of silicic acid; this layer very quickly reduces the strength of the current owing to its bad conductivity.

M. DUTER has made some very interesting experiments on magnetic shells. He finds that, if thin disks of steel be placed in the field of a powerful electro-magnet so as to magnetise them through from face to face, when they are removed from the field, they have almost entirely ceased to be magnets; but the faint trace left still showing that the disks were magnetised as shells. Again, M. Duter built up a series of steel disks, either separated by thin paper or cardboard, or placed directly together. This series was then magnetised with the disks in the same position as before: now on removing the whole from the field he found he had a permanent magnet, fairly powerful and regularly magnetised. His next step was to take the magnet to pieces by separating it disk from disk; each disk was then found to have almost ceased to be a magnet, but on placing them together again he found that he still had a permanent magnet, but weaker than before.

M. BOUQUET DE LA GRYE has invented a multiplying seismograph. The instrument has been fixed at Puebla, and a series of observations made during November and December 1882 show twenty-two abnormal movements in one month, probably seismic, only one being felt at Puebla. The sun and moon have been proved to have a direct action on the pendulum, the sun repelling it and the moon attracting it.

M. A. RIGHI has published a paper in the *Journal de Physique* on "The Influence of Heat and Magnetism on the Electrical Resistance of Bismuth." He says that the resistance of bismuth increases between some temperatures and decreases between others. These variations can be drawn in a curve which shows a maximum at a low temperature, then a minimum, again another maximum just before fusing, and a second minimum whilst in a liquid state, this minimum being in value about one-half the foregoing maximum. The positions of these maxima and minima vary with the physical conditions of the bismuth; if the bismuth be cooled rapidly, the two maxima approach one another until they even merge together, and the curve becomes similar to a parabola. In the first case the two maxima occur at -40° C. and 240° C., the intervening minimum being at 115° C. In the case of rapidly cooled bismuth the single maximum is at 50° C. These results only occur in commercial bismuth, and are more exaggerated as the bismuth is hardened in the preparation, wire showing them more than castings, and cold drawn wire more than hot. Pure bismuth behaves like an ordinary metal. The resistance of bismuth either pure or commercial is increased in the magnetic field; in some experiments the increase has been one-eighth of the original resistance. The increase in resistances is generally proportional to the magnetic force, and decreases with a rise in temperature.

In a recent paper by M. Planté, he gives the result of some experiments made to arrive at the cause and explanation of ball lightning; he was led to these experiments by having one of his mica condensers destroyed by a similar phenomenon. He charged one of his condensers from his secondary battery of 800 pairs, when the condenser was pierced, and instead of a bright spark a small incandescent globule was formed, which moved slowly over the surface of the condenser, following the parts where the insulating layer had least resistance, and destroying the metal film; the path being most curious and erratic. This motion continued, and the globule lasted one or two minutes, until the batteries ran down. In the case of a condenser in which the insulating material was ebonite, a sound was emitted similar to a toothed wheel being rapidly rotated against a piece of cardboard or sheet metal; at the same time there was a strong smell similar to that produced when ebonite is burnt. M. Planté repeated this experiment with 1600 secondary cells, which gave an electromotive force of 46,000 volts, and obtained a similar but much more complicated result. The second experiment made was to make a condenser of two flat pads of filter paper moistened with distilled water and brought near together so as to form an air condenser; now on connecting this condenser with his battery he obtained an incandescent globule which moved about between the pads and passed from one to the other. In this case he noticed that if the pads became dry at any point the globule disappeared, but either appeared at some other point, or at the same point again, as soon as it again became damp. In this experiment he found that the globule lasted a much greater time than in the case of the mica condenser, which fact was owing to the greater resistance in the condenser plates which did not allow the battery to discharge so rapidly.

GEOGRAPHICAL NOTES

To the *Bolletino* of the Italian Geographical Society for September Prof. Bellio contributes an account of a curious manuscript by the Sicilian missionary Fra Teramo Castelli (1597-1659), who spent the better part of his life in Trans-Caucasia. This altogether unique work comprises seven thick folio volumes, originally preserved in the Theatine Convent, Palermo, but, after the suppression of the religious orders, rescued from destruction and removed by P. di Marzo to the communal library of that city. Its peculiar character will be at once evident when it is stated that there is no written text, all the volumes containing nothing but pen-and-ink sketches and other illustrations, accompanied by brief legends or explanations mostly in Italian or indifferent Latin, but occasionally also in

Greek and Georgian. This method was deliberately adopted by the author or artist to convey his impression of men and things, because, as he naively remarks, "we thus see at a glance the fact, which, if written out, would take up much time both of the writer and of the reader." Of the designs, of which there are altogether 1176, 347 are of little value, being occupied with mystic, devotional, or ascetic subjects. But all the rest are highly interesting, especially to students of geography and ethnography. The two regions chiefly illustrated are Mingrelia (basins of the Rion and Ingur) and Georgia proper (basin of the Kur), jointly stretching from the Euxine to the Caspian, and bounded on the south by Armenia, on the north by "the kingdom of Astacan," that is, the Tatar khanate of Astrakhan. Mingrelia is identified with the ancient Colchis, while Georgia, "quæ Gurgistan barbaris dicitur," is said to comprise not only Iberia, but also a part of Greater Armenia and a portion of Atropatia, or Atropatene. Frequent allusion is made to the great fertility, rank vegetation, and moist climate of the low-lying tracts, whence arise "dropsy, extremely dangerous tertian and quartan fevers, causing worms to abound in the stomach and flesh of the people, on which account they consume vast quantities of salt." They are otherwise described as Christians of the Greek rite "with a little difference," very numerous and warlike, especially the highlanders, still sometimes wearing armour, and endowed with great physical beauty. There is a portrait of a certain Mamia "Gorielis Princeps Armatus," mounted on a charger, and dressed in a complete coat-of-mail, with high boots, helmet, plume, spear, and shield. It is curious that this practice of wearing armour still lingers among the Khevsur highlanders of the same region. A striking contrast to the Gorean warrior is presented by the picture of Vommissa, a poetess wearing a simple robe, a double row of pearls round her neck, a head-dress also fringed with pearls, and a rich mantle lined with fur. She holds a quill in her right hand, a scroll of paper or parchment in her left, and round about are disposed an ink-bottle, more paper, a penknife, a pair of scissors, and a vase apparently containing perfumes. Another lady, the Princess Lipardiani, is provided with a fan somewhat in the shape of a violin, with a little square mirror let in at the narrow part, exactly of the same form as is still fashionable in the country. "According to the seasons they gather the harvests of barley, millet, grapes, and nuts," is a legend occurring under one of the numerous designs representing peasants reaping corn as high as a man and making sheaves such as are commonly seen in Italy. Elsewhere is figured a scene in a market town with the explanation: "Trade is carried on by barter; one hen for two pounds of salt, one sheep for two hens, one sword for two goats, one horse for three oxen," adding that all these values are determined by official tariffs. Amongst the sports is one called *trocus*, which from the accompanying description seems to be identical with the game of polo recently introduced into England from the East. "Four horsemen gallop about playing with a ball the size of an orange, which they endeavour to pick up from the ground, hurl into the air, and drive forward with a racket." Then it is added in Latin: "Equites ludentes hoc pacto ut aspici rarissimi sciunt se ipsos gerere, requirunt agilitas quadam cum certo determinato impulsu ita ut si plus aut minores ponuntur spiritus non bene ludunt sæpeque quasi novi *jetolontes* cadunt in terra ab aliis equis cursoribus." Under several characteristic portraits of natives occur Latin verses pointing out how the mental faculties and moral tendencies may be deduced from the form of the head and expression of the features, thus anticipating the doctrine of Lavater. Of forty-six designs figuring the Sultan and his Court, his army and chief subjects, several are of considerable ethnological interest, comprising portraits of Persians, Arabs, Tatars, Egyptians, Circassians, Indians, Chinese, Portuguese, and other nationalities. Appended to these figures is, for the times, remarkably liberal sentiment that all nations have good and bad qualities irrespective of their religions, and that the Chinese have a good system of philosophy and theology, although different from that of Christian peoples. Prof. Bellio's paper is enriched with a large number of facsimiles conveying an excellent idea of these curious volumes.

THE two last numbers of the *Russische Revue* contain articles on the little-known peninsula of Kamchatka, its geography, natural resources, and the history of its conquest. The districts adjoining the sea are so mountainous as to be almost uninhabitable. There is, indeed, one magnificent harbour in Awachinska Bay, and on this stands Petropaulovski. A chain of volcanic