SCIENCE

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MSS. intended for publication and books, etc., intended for review should be sent to the responsible editor, Professor J. McKeen Cattell, Garrison-on-Hudson N. Y.

*THE NOBEL PRIZES FOR SCIENTIFIC DISCOVERIES.**

LAWS AND REGULATIONS.

THE three corporations awarding the Nobel prizes are:

1. The Royal Academy of Sciences, at Stockholm, founded in 1739. The King is the protector of the Academy, which numbers 100 Swedish and Norwegian members and 75 foreign members.

2. The Swedish Academy, at Stockholm, instituted in 1786. The King is the protector. The members, exclusively Swedish, are limited to 18.

3. The Carolin Institute of Medicine and Surgery, at Stockholm, established in 1815. The number of professors is 22.

OBJECT OF THE ENDOWMENT.

The Nobel endowment is based on the will of Dr. Alfred Bernhard Nobel, engineer, drawn up November 27, 1895. The stipulations are as follows:

"The remainder of the fortune which I shall leave shall be disposed of in the following manner: The capital, converted into safe investments by the executors of my will, shall constitute a fund the interest of which shall be distributed annually as a reward to those who, in the course of the preceding year, shall have rendered the greatest services to humanity. The sum total shall be divided into five equal portions, assigned as follows:

"1. To the person having made the most important discovery or invention in the department of physical science.

"2. To the person having made the most important discovery or having produced the greatest improvement in chemistry.

*Summary received by the Department of State from the legation of Sweden and Norway, dated Washington, September 11, 1900, inclosing copy (in French) of the laws and regulations relating to the Nobel bequest.

general which have approved themselves to him during his long experience. As the author frankly admits, this is not a complete work for beginners, as all theory of construction is omitted; but as an adjunct to existing text-books it must prove of great service, being especially rich in examples of conventional representation and of line shading. Incidentally it shows also the remarkable adaptability of the author's system of lettering to reduction by photo-processes.

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BOOKS RECEIVED.

Elements of Mineralogy, Crystallography and Blowpipe Analysis. ALFRED J. MOSES and C. L. PARSONS. New York, D. Van Nostrand Company. 1900. Pp. vii + 409.

Elements of Physics for Use in High Schools. HENRY CREW. New York, The Macmillan Company. 1900. Second Edition Revised. Pp. xvi + 353. $1.10.

Ethnology. MICHAEL HABERLANDT. Translated by J. H. LOEW, London, Dent. Pp. viii + 169.

SCIENTIFIC JOURNALS AND ARTICLES.

THE *American Journal of Physiology* for October contains a very interesting and suggestive article by D. J. Lingle on 'The Action of certain Ions on Ventricular Muscle.' Particular attention is paid to the rhythmic activity of heart tissue as an ion effect. Strips from the ventricle of the turtle's heart were placed in solutions of non-conductors, in solutions of sodium, of calcium, and of potassium, and in solutions of these salts combined. Lingle found that the non-conductors he used (cane sugar, dextrose, glycerine) did not occasion rhythmic beats in the heart strips. In the solution of sodium salts, however, the strips always beat rhythmically. If a strip is kept in the solution the beats reach a maximum and then gradually decline to a complete standstill. The stopping is apparently due to poisonous action of the sodium salt alone, for the rhythm is prolonged by diluting the solution in which the strip remains or by exposing the strip for a shorter interval to the action of the strong solution. When transferred to solutions of sodium salts, strips which have been quiescent in non-conductors begin to beat as suddenly as if started by an electric shock. The application of calcium salts and the treatment of the tissue so that an excess of calcium salts remains in the tissue both fail to start rhythmic beats. Potassium salts are likewise ineffective. Moreover calcium and potassium in combination do not start beats, while sodium chloride always succeeds. These results have a remarkable similarity to the results obtained by Loeb on rhythmic contractions in striped muscle and the tissue of the swimming bell. According to Lingle, sodium and not calcium is the stimulus for rhythmic contraction in the heart; calcium and possibly potassium salts improve the rhythm by neutralizing the injurious action of pure sodium salt solutions. W. T. Porter and H. G. Beyer in a paper on 'The Relation of the Depressor Nerve to the Vasomotor Center' raise the question, Does the bulbar vasomotor center act as a physiological unit to lower or raise the general blood-pressure, or has it parts regulating the regional distribution of blood? This question they have endeavored to answer by investigating the depressor nerve, an afferent nerve regarded by Cyon and Ludwig as stimulating the bulbar vasomotor center to cause especial dilatation of abdominal blood vessels. First the depressor nerve was stimulated when the splanchnic nerves were prepared for experimentation but still intact. This caused a fall in blood-pressure usually from 35 to 40 per cent. Next the abdominal vessels were removed from vasomotor influence by cutting the splanchnic nerves. The blood-pressure which falls on cutting these nerves was restored to the normal level either by stimulating the peripheral ends of the cut nerves, or by intravenous injection of normal salt solution. Now, with the abdominal vessels free from vasomotor influence and the blood-pressure normal, the depressor nerves were again stimulated. The blood-pressure fell usually as much as it had previously fallen when the abdominal vessels were still connected with the bulb. From their results the investigators conclude that the depressor nerve has no special connection with cells controlling vasomotor fibers of the splanchnic nerves, and they express the opin-

ion that afferent nerves affect all the bulbar vasomotor cells alike. The bulbar vasomotor center, therefore, would not regulate the distribution of the blood in the several regions of the body, but would merely raise or lower the general blood-pressure.

The American Naturalist for August opens with an article 'On the Nesting Habits of the Brook Lamprey (*Lampetra wilderi*),' by Robert T. Young and Leon J. Cole, followed by a paper 'On Variation of the Rostrum in *Palæmonetes vulgaris* Herbst,' by Georg Duncker, in which the writer takes the ground that there is no relation between the average and the variability of a character. Frank Smith gives 'Some additional Data on the Position of the Sacrum in Necturus,' concluding that we need more data before trustworthy conclusions can be reached, and J. R. Slonaker describes 'A Strange Abnormality in the Circulatory System of the Common Rabbit (*Lepus sylvaticus*),' consisting of a connection between the portal vein and posterior *vena cava*. 'The Origin of the Middle Ocellus of the Adult Insect' is considered by Chujiro Kochi, and this is followed by part XII. of the 'Synopses of North-American Invertebrates' devoted to 'The Trematodes, Part I., The Heterocotylea or Monogenetic Forms,' by H. S. Pratt. There are numerous interesting reviews.

The Plant World for August has for its first article 'When Increase in Thickness begins in our Trees,' by Geo. T. Hastings, giving the results of some recent experiments. 'Judging by the Fruits,' by Byron D. Halsted, presents two series of examination papers with their answers based on a change of text-books from 'Gray's Lessons' to 'Coulter's Plant Relations.' C. F. Saunders describes the 'Root System of the Snake-Mouth Pagonia,' and the same writer gives a view of 'Quaker Bridge, New Jersey,' the spot where the very rare fern, *Schizæa pusilla*, was discovered. The Supplement, devoted to the 'Families of Flowering Plants,' by Charles Louis Pollard, contains descriptions of the Smilaceæ, Hæmodraceæ and several succeeding families.

In *The Osprey* for August Paul Bartsch continues 'Birds of the Road,' and Theodore Gill gives the sixth part of 'William Swainson and his Times,' coming down to the acquaintance of Swainson and Audubon and the interesting correspondence between the two. In the 'Letters' Witmer Stone prints a communication from Cassin on Baird's first paper, in which he described *Empidonax flaviventris* and *E. minimus*.

The Popular Science Monthly for September commences with an interesting account of 'The Modern Occult,' by Joseph Jastrow, concluding that it is Utopian to look forward to the day when the occult shall have disappeared. Frederic A. Lucas discusses 'Birds as Flying Machines,' drawing attention to the fact that there are various modes of flight. Wm. Baxter, Jr., describes 'Electric Automobiles,' and E. B. Rosa considers 'The Human Body as an Engine,' finding a striking parallel between the body and a locomotive. Simon Newcomb continues 'Chapters on the Stars,' treating mainly of their spectra and spectral research, and Havelock Ellis gives the second part of 'The Psychology of Red.' 'The Expenditure of the Working Classes' is treated by Henry Higgs, who considers that they waste a great deal, and George G. Groff presents a somewhat optimistic view of the 'Conquest of the Tropics.' In the Correspondence, R. E. C. Stearns shows the 'Antiquity of the Chewing Gum Habit' and there are some good summaries in 'The Progress of Science.'

NOTES ON INORGANIC CHEMISTRY.

When a decade or so ago the problem was solved of obtaining aluminum at a comparatively low cost, it was believed by many that there would be at once an immense demand for the metal, and that it would replace iron and perhaps other metals for many purposes. While this has not been the case, the demand for aluminum and the corresponding output have steadily, if slowly, increased, and at the present time are increasing rapidly. In the *Zeitschrift für angewandte Chemie*, W. C. Heraeus calls attention to the increasing use of aluminum in the chemical industries. One great difficulty heretofore in using aluminum for such purposes has been that when in contact with another