

* * * ordinarily they [reversions] deviate from the species in but a single character * * *. Quite different from this are the mutations of *Enothera*. Recognizable as seedlings, as rosettes differing in shape, edge and color of the root-leaves, and later with stems differing in structure and mode of branching, agreeing in the flowers, varying in the fruits, they possess a type entirely their own * * *.

The mutations can hardly be entirely fortuitous if, for several generations, out of every thousand offspring of pure *lamarckiana* parents, there appear more than ten plants marked by the particular complex group of characters which designate *oblonga*. Were *oblonga* demarcated from *lamarckiana* by but a single character it would be remarkable to find it appearing repeatedly and in such numbers. When we remember that it is defined by an extensive series of characters differentiating it from *lamarckiana* and from all the other mutants observed, are we not led to the conclusion that mutation in *Enothera lamarckiana* is not wholly fortuitous, but is to a degree predetermined; that there is some tendency to the production of the *oblonga* and other types in numbers much greater than would be secured by purely fortuitous and indeterminate mutation?

It seems of much interest that the evidence from paleontology in favor of determinate variation (or mutation) should be borne out by such careful observations as those of de Vries in so different a field of research.

I confess I do not quite understand Professor De Vries's statement—'In my experiments the mother species mutates *in all directions* [italics mine], in nearly all organs and characters, as well as for better or worse.' I can not see that the published descriptions of his observations do show mutation in all directions. They seem to show rather the continued reappearance of but a few (7) distinct types of mutation. To be sure, MacDougal finds thirteen instead of seven of these mutants from *Enothera lamarckiana*, but this is far from mutation in all directions. De Vries apparently meant merely to urge that the mutations were in several different directions and were such as could hardly be due to direct environmental influences, and

not to claim that the mutations were purely fortuitous and indeterminate.

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CURRENT NOTES ON METEOROLOGY.

THE TEACHING OF METEOROLOGY.

PROFESSOR CLEVELAND ABBE, of the U. S. Weather Bureau, delivered an address upon 'The Introduction of Meteorology into the Courses of Instruction in Mathematics and Physics,' before the Physics and Mathematics Section of the Central Association of Science and Mathematics Teachers, on November 26 last. This address has now been reprinted, and constitutes a strong plea for more instruction along meteorological lines in various courses in mathematics and physics in which meteorological problems could well be dealt with. Professor Abbe regards meteorology 'not so much a matter of observation and generalization as matter of deductive reasoning,' and rightly believes that our meteorological studies have *approached*—he does not say *reached*—the limit of what is likely to be discovered as the result of inductive processes. He does not suggest the introduction of a new study into the already overcrowded curriculum of schools and colleges, but he would have problems in mathematics and physics selected from among the many phenomena of the atmosphere which need investigation. Thus, among a few special subjects which are enumerated, we find the simpler applications of trigonometry in the determination of cloud heights and velocities, by means of the simpler methods, such as Lambert's and Feussner's, and by the use of the theodolite, photogrammeter and nephoscope; the theory of the wet bulb thermometer; the hypsometric formula of Laplace; thermometer corrections; the formation of a waterspout by Weyher's method; and the study of the wind velocity, pressure, temperature and dimensions of the cloud column. Professor Abbe's paper is suggestive, and points the way toward a considerable possible extension of sound meteorological education by utilizing the mathematical and physical machinery already in operation.

LABOR AND HEALTH ON THE ISTHMUS OF PANAMA.

HON. JOHN BARRETT, American Minister to Panama, discusses 'The Panama Canal and its Problems,' in the *Review of Reviews* for February. He points out what is well known to all who have made any study of the matter at all, viz., that 'the average white laborers of the United States can not possibly stand the tropical climate,' and favors the plan of securing Jamaica negroes to do the work on the canal. Up to the present time the governor-general of Jamaica has insisted on conditions, under which alone these Jamaicans can go, that have not commended themselves to our Secretary of War and to the chief engineer of the canal. It is stated that the Jamaicans themselves are anxious to secure work on the canal. Plans are also being discussed for bringing in Porto Ricans, Chinese and Japanese, and there is said to be a growing feeling on the isthmus that the Chinese may be the laborers upon whom the Canal Commission will have to depend. Unless we are mistaken, however, the Chinese laborers imported by the French engineers to work on the canal did not prove satisfactory.

Under the lead of Col. Gorgas, who made a brilliant record as health officer at Havana, splendid efforts are being made to kill the mosquito-carriers of yellow fever and malaria, but both sufficient money and an extended organization to prosecute the work are lacking. During the past six months there have been about fourteen cases of yellow fever.

NOTE.

A PAPER on the 'Geography of Manchuria,' in the *Journal of Geography*, for January, 1905, contains a brief discussion of climate. The author is Professor N. M. Fenneman, of the University of Wisconsin.

R. DEC. WARD.

SCIENTIFIC NOTES AND NEWS.

SIR MICHAEL FOSTER has decided to offer himself for reelection to the next parliament as member for the University of London. He seeks reelection as a representative of science and higher education; if reelected he will take

his seat as a member of the liberal party. A committee, with Sir Thomas Barlow as chairman, has been formed to promote his election.

THE Prussian Academy of Science has awarded its Helmholtz medal to Professor Ramón y Cajal, professor of neurology at Madrid.

THE Munich Academy of Sciences has awarded the Liebig medal for researches in agricultural chemistry to Dr. Adolf Frank, of Charlottenburg.

THE Royal Astronomical Society has awarded its Jackson-Gwilt bronze medal to Mr. Tebbutt, who for many years has carried on alone astronomical research in an observatory at his home in New South Wales.

M. JANSSEN, director of the observatory at Meudon, and M. Moissan, professor of chemistry at the Sorbonne, have been elected members of the St. Petersburg Academy of Sciences.

PROFESSOR SVANTE A. ARRHENIUS, of Stockholm, Professor W. F. P. Pfeffer, of Leipzig, and Professor W. Spring, of the University of Liège, have been elected honorary members of the German Chemical Society.

THE Physical Society of Frankfort has elected Professor E. Bamberger, of Zurich, and Professor J. Brühl, of Heidelberg, to honorary membership.

M. VIGER has been elected president of the French Society of Horticulture.

M. RADAU has been appointed president of the French Bureau of Longitude.

The Journal of the American Medical Association calls attention to the fact that the new French Cabinet contains two physicians, Dr. A. E. Gauthier, who is at the head of the department of public works which includes railroads, etc., and Dr. J. Dubief, minister of commerce. The latter was chief of the Marseilles Insane Asylum, 1886-1893, and then of the Rhone Asylum until elected deputy a year or so later. He has been a member of the committee on labor since 1902. The under-secretary of finance is also a physician, Dr. Merlou, who has served as deputy since 1889.