

account of these experiments from the earliest attempts of MM. Hermite and Besançon, the chief pioneers of the movement, to the latest ascents under the auspices of the International Committee in November 1896.

Perhaps the most interesting and suggestive chapter is that which deals with the theory of the ascent of an exploring balloon.

The results of the recent simultaneous international flight of aerophile balloons are also very suggestive.

The possible limits attainable by balloons are shown to depend quite as much on the character of the envelope as on the contained gas. Here also, for the first time, we find a clear exposition of the effect of the temperature of the gas over that of the surrounding air, and the "Montgolfier" effect of solar radiation in altering the height at which the balloon finds itself in neutral equilibrium.

When it is found that winter and summer can cause a change of 6000 feet, and day and night one of 8000 feet in the altitude attainable on the pressure theory, it must be recognised that the science of exploring balloons is far from simple.

The scientific value of such ascents, reaching as they have done already in the case of the "Cirrus" to 60,000 feet, or double that hitherto attained by man (Mr. Berson's 30,000 feet in the "Phoenix," December 1894), is undoubted, and M. de Fonville deserves the thanks of the scientific world for his lucid and fascinating account of a scientific art which is even more necessary for the advance of terrestrial and cosmical physics than the soundings of our deep-sea exploring ships. D. A.

A Geological Map of the Southern Transvaal. By F. H. Hatch, Ph.D., F.G.S. (London: Edward Stanford, 1897.)

THIS map, on the scale of four miles to the inch, will be useful to prospectors and those interested in the general geology of the district. The names and boundaries of the farms are given, and the geological map is accompanied by a physical map of the Transvaal.

The geological formations are broadly sketched in; the Witwatersrand, Black Reef and Megaliesberg series are represented as forming a trough let in by faults between a mass of primary rocks. The sections across country show a simplicity of structure for the Witwatersrand district with some complications by faulting north of Parys. The Witwatersrand beds are considered to represent the Table Mountain Sandstone and the Megaliesberg or Gats Rand series to be equivalent to the Zwartebbergen Sandstone group.

The extent to which the beds are interfered with by volcanic rocks can be seen from the map. Besides the interbedded flows of basalts and diabases, a large area west of Klerksdorp is represented as composed of rhyolitic and andesitic flows, and north of the Megaliesberg Range and north-east of Pretoria there is a wide tract coloured as gabbro. The igneous flows of Pre-Karoo age are confined in Cape Colony to formations older than the Table Mountain Sandstone, so that if the age of the Gats Rand beds is correctly determined, the southern Transvaal exhibits a volcanic phase unrepresented in the Cape.

Untersuchungen über das Erfrieren der Pflanzen. By Prof. Dr. Hans Molisch. Pp. viii + 73. (Jena: Fischer, 1897.)

IN "Untersuchungen über das Erfrieren der Pflanzen," Prof. Molisch recounts his experiments on the cooling and freezing of plants. Dr. Molisch has worked over much of the old ground, and his observations, in the main, confirm those of previous workers. A comparison of the results obtained by Dr. Molisch with those set forth in the admirable summary in Pfeffer's

"Pflanzen Physiologie," will show that the volume under notice contains little that is absolutely new.

By means of an improved apparatus, Dr. Molisch has examined the effects of freezing and thawing on such substances as starch-paste, gelatine, albumin and protoplasm. His conclusions confirm and extend those of Vogel and Kühne. As in the above-mentioned organic substances so in the protoplasm, e.g. of an amœba, freezing induces a reticular structure whose meshes contain pure ice. In many instances, however, ice formation only occurs, as is well known, outside the cell. Attention may, in passing, be drawn to the statement (p. 19) that, "to some extent," the smallness of plant cells represents "a means of protection against cold": were it not for the fact that the remark is considered worthy of repetition, it might have been regarded as intentionally ironical. As it is, it must be inferred that Dr. Molisch wishes to be numbered with the ultra-adaptationists.

Sachs had inferred, from observations on the relative rates of mortality in plants slowly and quickly thawed, that it is not the frost but the thaw that kills. H. Müller-Thurgau has shown this not to be generally correct. Dr. Molisch confirms H. Müller-Thurgau.

The most interesting of Dr. Molisch's experiments are those which prove that the withering of plants exposed to cold, although accompanied by, is not due to a slowing of the transpiration-current.

The practice of embodying a research in a volume intended for the public and the specialist alike is, where the results are of high generality, excellent; where, however, as in this volume, the results appeal primarily, if not solely, to the physiologist, and where the net is spread wide by rendering the meshes diffuse, fellow workers are entitled to protest. The "literature" is already a heavy burden and grievous to digest.

Random Shots at Birds and Men. By "Jim Crow." Pp. 117. (Westminster: The Roxburghe Press.)

THIS paper-covered booklet needs no extended notice from us. It is made up of very fugitive thoughts on birds, and moralisings on the ways of men, and is not, we should think, likely to interest either the student of science or the general reader.

LETTERS TO THE EDITOR

[The Editor does not hold himself responsible for opinions expressed by his correspondents. Neither can he undertake to return, or to correspond with the writers of, rejected manuscripts intended for this or any other part of NATURE. No notice is taken of anonymous communications.]

Some Errata in Maxwell's Paper "On Faraday's Lines of Force."

IN translating this paper of Maxwell for Ostwald's "Klassiker der exacten Wissenschaften," I have detected some errors, which are partly merely misprints, but partly also faults in the formulæ of some trouble to the reader. The German translation is only of value to those who have not leisure to study the English language before the works of Maxwell; but the accuracy of such classic works is so essential to every one, that I considered the publication of the errata found to be of even greater importance than my whole translation. But in order to make the translation as cheap as possible, the German editor refused to print my list of errata, and I therefore hope it will be printed in England.

Finally, if Maxwell and the editor of his works have not avoided some troublesome errors, I do not wish to apply the *quod Jovi licet, non bovi licet*, to Mr. Curry's new book, "Theory of Electricity and Magnetism" (Macmillan, 1897), but to excuse some errors therein.

In the following table the first column gives the place of the misprint in the *Cambridge Philosophical Transactions*, vol. x. 1856; the second in Maxwell's "Scientific Papers," vol. i.