

with which he, even their own author, accepts such startling speculations concerning the hereditary nature of the parasitic diseases of plants.

In the matter of the potato disease, Mr. Smith gives a history of the whole subject, and a full description of the oospores, which he claims to be those of the *Phytophthora*. At p. 340 there is a sentence of some interest in view of the above-mentioned theory.

"It is quite possible, then, that just as every atom of a mycelial thread of this fungus (potato fungus) will continue its growth to a perfect form, so every atom of a broken-up flagellum—perfectly invisible to the eyes even when the highest powers of the microscope are used—may be capable of carrying the poison and at length reproducing the perfect form of the fungus in the potato plant."

Everything is possible, but some things are undoubtedly highly improbable, and chief among these are those which we have not the slightest grounds for supposing probable. Such is the case with this speculation since (to take the flagellum only) in the first place it is not by any means certain, as the author indeed points out in the same paragraph, that a flagellum breaks up at all, and in the second it is quite unwarrantable on any known basis of fact to suppose that its fragments are endowed with any reproductive function.

Apart from such speculations, I venture to think that Mr. Smith has rendered the study of vegetable parasites a signal service in the publication of this book. Its practical uses to the farmer and the gardener are apparent, and to the student of the subject the advantage is no less, even in those cases where the author differs from the great majority of his fellow-workers, since "the case for the opposition" is as well and as strongly stated as the materials permit. The book is of practical value in this country, and it is, moreover, one which no intelligent agriculturist can afford to dispense with in these times, when farming is engaged in a struggle of such severity at so many points.

GEORGE MURRAY

#### OUR BOOK SHELF

*How to Foretell the Weather with the Pocket Spectroscope.* By F. W. Cory. (London: Chatto and Windus. 1884.)

IT is of little use putting any instrument, however simple it may look, into a student's hands, if he is not previously taught how to use it. This needful information is supplied by the handy little book now before us, showing what can be done with a direct-vision spectroscope only some  $3\frac{3}{4}$  inches long.

The book commences by describing two pocket spectroscopes now in use: the "rainband spectroscope," and a newer and somewhat larger instrument, "Grace's spectroscope," which, however, is still small enough for the pocket, being only  $5\frac{1}{2}$  inches long when closed, and which has the advantage of giving a larger spectrum. Here, however, there is a most important omission, for the adaptation of a lens to focus the image of a cloud or a part of the horizon on the slit is not referred to. Instruments thus armed are far better than those of the ordinary construction for meteorological purposes, and, as made by Hilger, they are not appreciably larger. We are next told how to use the spectroscope, and a map is given (Plate 1), showing the positions of some of the lines which the student should learn to recognise in the spectrum of the sun, in order to see at once if the rainband is present or not.

On another page we find the principal rainband itself (Plate 2), which is instructive as showing the student what to look for; but in the construction of this map a larger spectroscope, of two prisms, has been employed, so that if the student in looking for the rainband uses his pocket spectroscope, he will be somewhat disappointed. It would have been more complete if a drawing of the rainband, as seen with Grace's spectroscope, could have been given side by side with Plate 2, which shows so much of the detail.

The book concludes with letters, reprinted from the *Times*, from the Astronomer-Royal for Scotland and others, showing the value of the spectroscope for meteorological purposes.

We think no one can lay down this little volume without feeling this opinion confirmed, and that in the pocket spectroscope we possess an invaluable instrument with which to forecast the state of the weather. B.

*Celestial Motion: A Handy Book of Astronomy.* By W. T. Lynn. (London: Stanford, 1884.)

MR. LYNN'S long training at the Royal Observatory has eminently qualified him to write this little book. It is in no sense a school-book, but all the same it contains a most useful introduction to those parts of the science of astronomy of which it treats. These are the earth, sun, and moon; the planets arranged in three groups; comets, meteoroids, and the fixed stars. There is added a very painstaking and concise history of astronomical discovery, the only blot in which is an ineffective reference to spectrum analysis at the end.

*The First Six Books of the Elements of Euclid, and Props. i.—xxi. of Book xi., and an Appendix on the Cylinder, Sphere, Cone, &c.* With copious Annotations and numerous Exercises. By John Casey, LL.D., F.R.S. (Dublin: Hodges, Figgis, and Co., 1884.)

THIS is the second edition of a work which so accomplished a geometer as Prof. Henrici (vol. xxix. p. 453) has pronounced in these columns to be in many respects an "excellent" book. As the first edition contained 254 pages, and this one reaches 312 pages, it is manifest that the work has grown—and with its growth we find that it has acquired an accession of strength. We will indicate in what directions it has increased. First and foremost is the addition of the propositions of Euclid's Eleventh Book, which are generally read by junior students, and an appendix (well suited for candidates for the London Intermediate Examination) on the properties of the prism, pyramids, cylinder, sphere, and cone. There is also now given an explanation of the ratio of incommensurable quantities, and a still greater number, than in the first edition, of alternative proofs. Further, we can testify, by a careful perusal of the text, that the work has been "thoroughly revised as well as greatly enlarged." One feature we note, that whereas in the first edition the *syllabus* of the Association for the Improvement of Geometrical Teaching was often referred to by quotation, in this edition the name occurs but once or twice. There are reasons for most actions—we presume there are for this course of action.

We are glad to note that Dr. Casey makes frequent use of the term *right* line; the absence of the word "right" is liable to lead young boys astray; we should also prefer in one or two instances the term "circumference" (the line) to the term "circle."

Numerous easily rectified clerical mistakes occur, and we could wish that the author had uniformly written *AB* for a line drawn from *A* to *B* instead of apparently writing the letters haphazard. The terms *area* and *perimeter* are employed without definition; a work by Prof. Townsend (p. 142) is referred to without giving exact reference; and an examination question (p. 173) in-