The first and third divisions of this work seem unexceptionable; but the more purely botanical portion might be improved by revision, thus, for instance, at p. 178, cystoliths and crystallised concretions in plant-cells are treated of in a manner which suggests want of familiarity with the microscopic examination of plants, and is calculated to make a beginner suppose all the crystalline concretions of plants are cystoliths of some sort.

At p. 216, it is stated that "In some cases, cells consist only of protoplasm and nucleus, being destitute of cell-walls during a portion or the whole of their existence," and a single line might have been added to explain the exceptional conditions under which these cells—that are not cells—present themselves. Again, at p. 218, after the passage "many cells are altogether empty, and consist of nothing but the cell-wall," there might have been added "after cessation of the functions."

The Screw pine referred to at p. 227 is not a palm; and while the term "imbricated buds" is awkward, the reference, on the same page, to roots that have no buds seems to suggest that buds are generally present on roots inconsistently with what precedes.

Before concluding the notice of this work we must refer to one part of the introductory chapter, where the author very justly condemns as a delusive error the notion that there is any opposition or conflict between science and art, or between theory and practice. "They are, as they ever have been, and ever must be, in the fullest harmony. If they appear to jar or stand in contradiction, it is because we have something false or incomplete in what we call our science or our art; or else we do not perceive correctly; but are misled by the narrowness and aberrations of our vision. It is often said of a machine, that it is good in theory, but fails in practice. This is as untrue as untrue can be. If a machine fail in practice, it is because it is imperfect in theory. It should be said of such a failure—the machine was good, judged by the best theory known to its inventor, but its incapacity to work demonstrates that the theory had a flaw."

It is the boast of some who affect to glory in the sufficiency of practice and to decry theory, that the former is based upon experience, which is the only safe guide. But this is a one-sided view of the matter. Theory is also based upon experience, if it be truly scientific. The vague surmise of an ignorant and undisciplined mind is not theory. Theory, in the proper and good sense, is always a deduction from facts—the best deduction of which the stock of facts in our possession admits. It is the interpretation of facts. It is the expression of the ideas which facts awaken when submitted to a fertile imagination and well-balanced judgment.

If the appreciation of these views were at all equal to their truth, and if the importance of their bearing on the advancement of agriculture were at all adequately recognised, there would probably be little reason to lament the want of attention either on the part of the farmer or the statesman, to the scientific aspects of that pursuit, and less scope for that blatant obstructive, the "practical man," who shuts his eyes and ears against everything his grandfather did not know of, believes only in the folly of wisdom, and is supremely happy in his own ignorance.

OUR BOOK SHELF

A Geographical Handbook of all known Ferns, with Tables to show their Distribution. By K. M. Lyell. (Murray, 1870.)

THIS useful and unpretending, but elegant little volume, consists of two parts. In the first, the genera and species of ferns are enumerated under a number of geographical divisions and subdivisions, which appear to have been judiciously selected. The stations, habitats, and geographical range of each species, are given with much care, and the authorities fully quoted. It thus forms a series of fern catalogues for eighteen divisions of the globe. The second part consists of a systematic list of all the species, with their range of distribution indicated in eighteen columns. Sir William Hooker's arrangements and limitations of species have been followed throughout, and this gives a unity to the work which has its value. But as ferns have generally so wide a range that genera restricted to any one part of the globe are exceptional, we think it would be as well in a work of this nature, to adopt the additional genera of John Smith and others.

We would also suggest for another edition, that a summary of the genera and species might be usefully given at the head of each geographical subdivision. Thus for "Europe Proper" we should have:

1. Woodsia	2 species	13. Asplenium	17 species
2. Dicksonia	1 ,,	14. Scolopendrium	2 ,,
3. Hymenophyllum	1 ,,	15. Aspidium	2 ,,
4. Trichomanes	1 ,,	16. Nephrodium	6 ,,
5. Davallia	1 ,,	17. Polypodium	4 ,,
6. Cystopteris	4 ,,	18. Nolhochlæna	2 ,,
7. Adiantum	2 ,,	19. Gymnogramme	2 ,,
8. Cheilanthes	3 ,,	20. Osmunda	1 ,,
9. Cryptogramme	1 ,,	21. Ophioglossum	2 ,,
10. Pteris	4 ,,	22. Botrychium	5 ,,
11. Lomaria	1 ,,		
12. Woodwardia	1 ,,		55 species

Such summaries would offer useful materials for comparison, and show at a glance what genera were abundant, rare, or wanting, in a given district. We also think the specific names should have been printed with some difference of type, so as more readily to catch the eye; but these are small matters in so useful a work, which must have been a labour of love to its author, and which no lover of ferns should be without. A. R. W.

Agricultural Analysis.—*Agricultural Qualitative and Quantitative Chemical Analysis.* After E. Wolff, Fresenius, Krocker, and others. Edited by G. C. Caldwell. Pp. vi. and 307. 8vo. (New York: Judd. London: Trübner, 1869.)

MR. CALDWELL (Professor of Agricultural Chemistry in the Cornell University) prepared this compilation for the use of his own pupils and agricultural students generally. Many of the chapters consist of translations from Wolff's "Anleitung," and much more is taken from Fresenius's well-known works on analysis. The metric system of weights and measures, and the centigrade thermometric scale are adopted throughout; and a useful, but not sufficiently extensive set of tables is given at the end of the work.

The merit of a treatise of this kind consists in a proper selection and arrangement of materials; and Prof. Caldwell seems to have performed his task satisfactorily, though, as he admits, somewhat hastily. It is hardly necessary to add, that the book would be quite as much out of place in the hands of an unassisted student as any of those of which it is an adaptation. Under the guidance of a teacher, however, it would undoubtedly be of much service in an agricultural laboratory.

Jahrbuch der Erfindungen. H. Hirzel und H. Gretschel. (Leipzig: Quandt und Händel, 1869.)

THIS is one of a type of books which is not published in this country, either because our publishers are not sufficiently energetic, or because our public has not as yet