papers, and "Church Architecture", with two. Looking for articles on geophysical prospecting, one finds none under "Geophysics", but there is a cross-reference to "Prospecting" where there is one article. This leads to "Electrical Prospecting", with one more, and thence to "Torsion Balance" with another article. There is no reference to a paper on "Applications of sound-prospecting to geophysics", which is listed under "Sound: Propagation". If the subject were more comprehensive, the maze of cross-references would be still more bewildering, leading in the end to the collection of references to the papers of only a single year.

In spite of the system, however, the work should be recommended as a very useful index for the general librarian and for the reader who does not need to exhaust his subject.

S. C. BRADFORD.

Our Bookshelf.

Field and Colliery Surveying: a Text-book for Students of Mining and Civil Engineering Surveying. By T. A. O'Donahue and T. G. Bocking. New and revised edition. Pp. xvi + 327. (London: Macmillan and Co., Ltd., 1928.) 10*s.* 6*d.* net.

THIS book has been reprinted, sometimes with additions and revisions, no less than thirteen times. Past success guarantees the success of an able revision. The size of page of the present edition has increased by some fifteen per cent, and there are fourteen more pages, while much of the groundwork in geometry and mensuration has been wisely omitted to make room for descriptions of improvements in surveying instruments and methods. The original author has been joined by Mr. T. G. Bocking, a surveyor well known not only in practice but also by his important contributions to the periodical press and to the *Transactions* of the Institution of Mining Engineers. Both authors are prominent in the mining profession: both have had experience as examiners; the collaboration is therefore a happy one and is also to be welcomed because, while one author obtained his early experience in the north, the other has had experience both as a civil and mining engineer mainly in the midlands and the south. This revision has purged the book of some localisms of practice and provincialisms of expression.

The book should now be fairly representative of the survey practice in many British coalfields. But it is clearly not a complete exposition, and the only excuse for its sub-title is that it will be useful to pupils of firms styling themselves "Civil and Mining Engineers". The preference of Mr. Bocking for his three-tripod theodolitic outfit is made clear, but this scarcely warrants the extreme brevity of the treatment of the Galletly modification; and his curt dismissal of one-tripod outfits in a few lines is regrettable. His generalisation that "a surveyor should learn to dispense with this additional complication (a centring device) and become experienced in setting up expeditiously and accurately without it" is only valid for three-tripod outfits; applied to one-tripod outfits, it is a case of Bocking *contra mundum*. For such devices abound; every firm of instrument-makers of whatever nationality manufactures them; and they are universally adopted underground and generally for surfacial surveys.

The selected instance of a traverse of 8505 ft. with closing errors of $e_x = -1{\cdot}79$ ft., $e_y = -0{\cdot}96$ ft., $e_z = \pm 0{\cdot}26$ ft. does not prove the excellence of Mr. Bocking's outfit and method, for accidental errors are most commonly mutually destructive, and the most probable aggregate of such errors is zero; what it does show is lack of sympathy with the modern practice of teaching university students to test the performances of instruments from statistics by averaging, or by the method of least squares, and thus more rapidly and surely to arrive at conclusions which the surveyor anciently formed from the impressions of a lifelong experience!

L. H. COOKE.

Probleme der kosmischen Physik. Herausgegeben von Prof. Christian Jensen und Prof. Dr. Arnold Schwassmann. Band 11: *Das Zodiakallicht; sein Wesen, seine kosmische oder tellurische Stellung.* Von Dr. Friedrich Schmid. Pp. x + 132 + 4 Tafeln. (Hamburg: Henri Grand, 1928.) 10·50 gold marks.

THIS excellent series of monographs serves a valuable purpose in providing separate works on many interesting natural phenomena, and not least in the case of those of minor interest, the literature of which is fragmentary and widely scattered; workers in other fields can turn to these books with fair confidence that they will find all the important facts and theories concerning the respective subjects. In particular this is the case with the volume under review, which appears to be almost the first book expressly devoted to the zodiacal light; the author is an enthusiastic student of the subject, and has observed it systematically for nearly forty years. The volume is of great interest both on the side of observation and on that of theory; it may be hoped that it will lead others to observe the zodiacal light regularly, especially since the way in which the position and form of the light vary with the latitude and longitude of the station of observation is not yet adequately known.

The main theoretical question involved in the subject is whether the rarefied matter which, by reflection of sunlight, produces the zodiacal light, is distributed throughout the solar system up to or beyond the earth's orbit, or whether it is merely a terrestrial appendage. The author argues cogently for the latter view; he regards the zodiacal light as the highest and last twilight bow produced by the bending of light in the earth's atmosphere. The theory implies an immense extension of the earth's atmosphere, with an oblateness in a plane