OUR BOOK SHELF.

Tafeln zur Theoretischen Astronomie. By Julius Bausch-
inger. Pp. 148. (Leipzig: Wilhelm Engelmann,
1901.) Price 12*s.* net.

MOST astronomers are familiar with the very excellent
volume entitled "Formeln und Hülfstafeln für Geo-
graphische Ortsbestimmungen," by Prof. Th. Albrecht;
this work contains in a small compass most of the
formulæ and tables required for geodetic work, and the
very clear descriptions of the processes involved make
the volume a veritable *vade mecum* for those employed
on such work.

The volume before us does for "theoretical astronomy,"
that is astronomy dealing with the determination of the
positions and orbits of bodies in space, what the above-
mentioned book does for geodetic work, and the main
attempt of the compiler has been to bring together in a
compact and complete form all that is required by the
computer, rendering it unnecessary for him to seek aid
from other books. In this class of work the computer
has generally to consult more than one volume in which
suitable tables for his calculations occur, such as, for
instance, the valuable work of von Oppolzer, and in some
cases the tables are not of the most convenient form.

The present volume, therefore, serves a most useful
purpose, and the arrangement of the tables leaves, so far
as can be seen without actually working out a prob-
lem, little to be further desired. The tables, which
are forty-five in number, are arranged under six sub-
heads. The first of these divisions is devoted to such
objects as conversion of time into divisions of arc, mean
time into sidereal time, &c., and *vice versâ.* The next is for
the determination of the true anomaly from the time and
vice versâ, for elliptic, parabolic and hyperbolic motion,
and here three methods for the solution of Kepler's
equation are given; two of them are based on Tietzen's
solution and are purely computational, while the third is
after the graphical method of Waterston and Dubois
and is accompanied by two loose charts.

The third set of tables deals with the part of the
problem relating to the determination of the first ap-
proximate orbit, in which both Euler's and Lambert's
equations are required; while this is followed by tables
which serve for the computation of special perturbations
and improvement of the elements determined by the first
approximation.

The fifth part gives the means for calculating preces-
sion, nutation, aberration and parallax, and contains a
list of the chief observatories of the world and their co-
ordinates, with data for parallax determination.

The sixth and last section is formed of miscellaneous
tables which are of general use in work of this kind;
thus we have formulæ and tables for interpolation, differen-
tiation and integration, mechanical differentiation, &c.,
concluding, amongst others, with mathematical, astro-
nomical and geodetic constants.

All the tables which depend on astronomical constants
have been recalculated and based on the Paris Conference
constants, while each table is clearly explained and in
most cases accompanied by an example worked out step
by step.

This book of tables will, with very little doubt, be of
considerable service both to the experienced computer
and to the student who is working out orbits for the first
time. Great praise is due to the compiler who has per-
formed this laborious task with so much care and with
such success.

An Elementary Treatise on Alternating Currents. By
W. G. Rhodes, M.Sc. (Vict.). Pp. xii+211. (London:
Longmans, Green and Co., 1902.) Price 7*s.* 6*d.* net.

MR. RHODES' treatise on alternating currents can hardly
be regarded as particularly elementary, since he certainly
assumes in his readers a preliminary acquaintance with

the principles of the subject. We are inclined to think
that although the mathematical parts are good, the
treatment on the electrical side, especially in the simpler
parts, leaves a good deal to be desired. Thus on p. 23
the quantity $2\pi n L$ is defined as the reactance, whereas
a few pages further on (p. 31) this name is used for the
fuller expression including self-induction and capacity,
without any explanation as to why the same term is used
in both cases; the same observations apply to the defi-
nition of impedance. One may be pardoned for laying
stress on such faults as these, since the subject is at best
a difficult one, and without a perfectly sound knowledge
of the fundamental ideas, the student will never make
much progress.

The author has aimed at using the calculus as little as
possible, and, where its employment is inevitable, has
given the solution of an equation in the text and the
working in the appendix. Many of the problems are
solved by vector algebra, to an explanation of the prin-
ciples of which a short chapter is devoted. The design
of transformers and the theory of the synchronous motor
and polyphase currents are treated at some length. It
is to be noted that although hysteresis is of necessity
considered, it is nowhere adequately explained. Another
omission is that no description is given of any method
of determining the wave form of an alternating current
or P.D., although there is a chapter on the subject of
alternating measurements. We do not doubt that the
book will be found very useful, but its value would be
greatly increased by a more careful attention to
thoroughness and completeness.　　　　　　　M. S.

Cyanide Practice. By Alfred James, Member of the
Institution of Mining and Metallurgy, F.G.S., F.C.S.
Pp. xii + 174. (London: E. and F. N. Spon, Ltd.;
New York: Engineering and Mining Journal Incor-
porated. Not dated). Price 15*s.* net.

ALTHOUGH there are now a number of books in which
some information on the cyanide process can be found, a
full and satisfactory description of it has not yet been
written, and can hardly be expected until more experi-
ence has been gained. Meanwhile, no instalment of the
complete account can be more interesting and important
than that giving a record of the experience and views of
Mr. Alfred James.

Mr. James was the pioneer of the process in South
Africa in 1888, and to him belongs the credit of adapting
it to the treatment of auriferous tailings at a time when
cyanide was in some danger of being set aside for the
time owing to the difficulties encountered in the treat-
ment of virgin ores with its aid. When a good start had
been made, and the value of cyanide solutions demon-
strated, a host of workers took up the task and a vast
industry was created on the foundations laid by Mr.
James; but the part he played in promoting the pros-
perity of the Witwatersrand gold mines will always be
remembered with gratitude by metallurgists.

As might be expected, the book is full of good things,
details of construction of vats and extractor boxes useful
to the general manager, hints on extraction and precipita-
tion designed to aid the millman, and hitherto unpub-
lished researches on bromocyanide which will be read
with avidity by the chemist. The method of arrange-
ment, however, leaves something to be desired. Some
sections consist of papers read at various institutions
which have been reprinted almost without change and
without much effort to make them part of a coherent
whole. The imperfections of the index render it difficult
to refer to any particular point, and the only way to avoid
missing important details is to make oneself familiar with
the whole book, which is, fortunately, tersely written and
by no means long. Difficult as it may be, however, to
take full advantage of Mr. James's work, no one con-
cerned in the cyanide process can afford to do without
the volume which he has produced.