Erkenntnistheoretische Grundzüge der Naturwissenschaften. Von
Professor Dr. P. VOLKMANN. Leipzig, Teubner, 1896.
8vo, xii + 181 pp.

For centuries the study of the various forms of knowl-
edge was not differentiated. When the division was made
the natural tendency was to go to an extreme. It must be
acknowledged that the history of philosophy, in particular
metaphysics, is a propædeutic to the study of all science.
Until quite modern times mathematical reasoning was in
nearly every case bound up with physical reasoning and it is
only in most recent days that the idea has prevailed that
mathematics forms a subject which is more intimately con-
nected with logic than with other divisions of knowledge.
From the connections with physics and logic it is obvious
that the terminology of mathematics can only be under-
stood by one with at least a certain knowledge of the
methods of reasoning of the natural sciences and of the
connotation of the words used in those sciences. This is so
well understood that the language of several of the leading
mathematicians of Germany and France has been enriched
by words drawn from mechanics. The relation of mathe-
matics to both metaphysics and physics justifies the mathe-
matician in taking an interest in the book in hand, as in
fact in every book of the kind since the time of Mill.

Dr. Volkmann, professor of mathematical physics at the
University of Königsberg, is particularly qualified to set
forth the principles of the middle ground between science
and philosophy. Two quotations will indicate the scope of
the book : "The discussion here is directed less to col-
leagues in one department than to the cultured public with
scientific interests." "We may be the best logicians with-
out progressing a single step in knowledge ; possibly ex-
actly this wish to be such good logicians prevents us from
making progress in knowledge. The difficulty of a cogni-
tion does not at all lie in the difficulty of correct reasoning,
it lies rather in the mode and manner of acquiring and sift-
ing truly appropriate material, it lies also in the manage-
ment of the inflexible material with which our praised and
omnipresent logic has to work."

In a terse and interesting way Professor Volkmann leads
up to the treatment of induction and deduction. He then
takes up what he calls "Isolation" and "Superposition."
Each phenomenon of nature is a composite made up of
elements. The ability to isolate these elements so that
they may be studied separately, and then the ability to

combine these elements properly, are necessary steps in
all study of phenomena. These two processes are the prod-
ucts of what may be called a refined form of Mill's
method of concomitant variations.

The chapter dealing with the idea of order of magnitude
and measurement is of particular interest to the scientist.

H. D. THOMPSON.

NOTES.

PROFESSOR FELIX KLEIN's Lectures on Mathematics,
known as "The Evanston Colloquium" (New York, Mac-
millan, 1894), are out of print. A. Hermann, of Paris, has
just brought out a French translation of this work, pre-
pared by M. L. Laugel ; the title is, "Conférences sur les
mathématiques, faites au congrès de mathématiques tenu à
l' occasion de l' exposition de Chicago." M. Laugel has
added seventeen pages of valuable bibliographical notes,
thus bringing the references up to date.

M. Laugel has also accomplished the difficult task of
translating into French the collected mathematical works
of Bernhard Riemann. This translation is now in the
press of MM. Gauthier-Villars and will soon be ready.

THE memoir on the analytical representation of direc-
tion, etc., published by Caspar Wessel, in 1797, which con-
tains the earliest systematic attempt at a geometrical inter-
pretation of imaginaries was the subject of Professor W. W.
Beman's vice-presidential address before Section A of the
American Association for the Advancement of Science last
summer. The address was published in full in *Science*,
vol. 6, pp. 297–307 (Aug. 27, 1897).

AT the meeting of the Paris Academy of Sciences, Feb-
ruary 7, 1898, the death of the well-known publisher, M.
JEAN ALBERT GAUTHIER-VILLARS, was announced, and
resolutions were adopted in recognition of his manifold
services to science, particularly of his generous assistance
to the French Government and the Academy in publishing
the complete works of Lagrange, Fermat, Fourier, and
Cauchy.

THE Schubert prize of the Imperial Academy of Sciences,
St. Petersburg, has been awarded to PROFESSOR SIMON
NEWCOMB for work in theoretical astronomy.