The Copernicus of Antiquity (Aristarchus of Samos). By Sir Thomas Heath.
    London, Society for Promoting Christian Knowledge, and New York,
    The Macmillan Company, 1920.   59 pp.

It is always a matter for congratulation when a man of the highest
scientific standing can be prevailed upon to give to the public a brief
summary, in readable form, of results obtained in parts of his field.   The
little volume under review is such a contribution from the pen of the world's
premier authority on Greek mathematics and mathematicians.   Of the
56 pages of text, 37 are devoted to a short outline of the development of
Greek astronomy before Aristarchus (that is, down to the 3d century B.C.),
and it would be hard to find in so short a space an equally illuminating
discussion of the subject.

The remainder of the text gives the 18 propositions of Aristarchus's
only extant work, *On the sizes and distances of the sun and moon,* with a
very brief indication of the methods of proof used.   The most important
of these propositions are the 7th, that the sun's distance from the earth
is greater than 18, but less than 20, times that of the moon; and the 15th,
that the diameter of the sun has to the diameter of the earth a ratio greater
than 19 : 3 but less than 43 : 6.   Although these results are wide of the
mark, the methods used are entirely correct, and furnish a very interesting
example of the way in which the Greeks used geometric inequalities to
obtain numerical results which we now get from trigonometric tables.

Aristarchus's title, "The Copernicus of antiquity," rests upon the testi-
mony of Archimedes and other ancient writers, who state explicitly that
he taught the hypothesis of the double motion of the earth.   It seems to
have been the weight of Hipparchus's influence (2d century B.C.) which
led to the rejection of this theory and the fixing of the geocentric theory
in the position which it held unshaken for over 1500 years.

One who wishes fuller details as to Aristarchus and his work will of
course turn to Sir Thomas Heath's *Aristarchus of Samos* (Oxford, 1913),
which contains the complete Greek text and translation.   For the general
reader, however, the present work contains the gist of the matter (save for
proofs).   The one regrettable defect is the entire absence of figures.   The
two-page bibliography at the end is a useful addition.

R. B. McCLENON

Éléments de la Théorie des Vecteurs et de la Géométrie Analytique. By Paul
    Appell.   Paris, Payot et Cie, 1921.   147 pp.

This little volume in the Collection Payot gives in small space an
introduction to the ideas of vectors.   Coordinates are introduced as
projections of a vector and vectors are represented throughout as a couple
or a triple of coordinates.   No attempt is made to bring in vector notation.
It succeeds very well in setting forth the concepts of two and of three
dimensions.   No curve or surface is discussed at length.   For those de-
siring a brief and very intelligible exposition of the elementary notions of
vectors and analytic geometry it is recommended.

J. B. SHAW.