

*Kepler.* By Walter W. Bryant. London, Society for Promoting Christian Knowledge (New York, Macmillan), 1920. 62 pp. + portrait.

This little work is one of the popular series of biographies now appearing under the name of "Pioneers of Progress," published by the Society for Promoting Christian Knowledge. It is written by a member of the staff of the Royal Observatory at Greenwich, one who knows astronomy, is conversant with its noble history, and appreciates the contributions of the greatest mathematical astronomer of his time, and perhaps of all time.

The date of the publication of the essay is appropriate, the current year (more precisely, December 21, 1921) being the three hundred and fiftieth anniversary of Kepler's birth. It is also timely that the world should consider the contributions which Kepler made to the theory of celestial mechanics, comparing them, and those made by Newton and Laplace, with the new theory which is now attracting so much serious attention on the part of scholars and attaining so much notoriety in the public press.

The work consists of six chapters, as follows: I. Astronomy before Kepler; II. Early life of Kepler; III. Tycho Brahe; IV. Kepler joins Tycho; V. Kepler's laws; VI. Closing years. To these are added a list of dates, a brief bibliography, and a glossary of terms that will be helpful.

The first chapter gives a brief sketch of the leading theories advanced by Greek and medieval scholars to account for the motion of the planets, and then sets forth the nature of the advance made by Copernicus. The author calls attention to the common error of believing that the heliocentric theory was clearly stated by Copernicus; for the latter, "still hampered by tradition, did not reach" it. Most of the work is, however, devoted to Kepler and his discoveries. These were, as is well known, intermingled with naive theories that can well be excused in the childhood of modern astronomy. The supposed relation of the five planets (as then known) to the five regular polyhedrons is Pythagoreanism two thousand years delayed, and it seems inconceivable to us that the one who discovered Kepler's laws could have advocated such an absurd theory. The fact simply helps us to appreciate the intellectual atmosphere in which the continental scientists of Shakespeare's time were living.

Kepler's association with Tycho Brahe is briefly set forth. The latter was well advanced in the study of astronomy before Kepler was born, and when the latter was less than a year old Tycho was making observations of considerable importance. Indeed, the celebrated observatory at Uranienborg was built when Kepler was only five years of age, and here and then Tycho was prescribing sulphur to cure infectious diseases "brought on by the sulphurous vapors of the Aurora Borealis"! It was not at this great observatory, however, that Kepler took up his studies, but in Prag, whither Tycho had gone after the death of his Danish patron. It was here that the younger man began his great work, the details of which are skillfully summarized in the essay under review. The mingling of the mystic and the scientist, of the astrologer and the astronomer, of the small mind and the giant intellect are so well set forth in a few pages that the little work may safely be recommended as one of the best of the series. It should be welcome in the schools and is justified in the library of the scholar.

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