The Commentaries of Proclus on the First Book of Euclid's Elements of Geometry Translated by Thomas Taylor (London, 1792) Proposition 45

Transcribed by David R. Wilkins

August 2020

[Thomas Taylor, *The Philosophical and Mathematical Commentaries of Proclus*, Vol. 2, pp. 200–201 (1792).]

PROPOSITION XLV. PROBLEM XIII.

To construct a parallelogram equal to a given right-lined figure, in a given rectilineal angle.

The present is more universal than the two problems, in which he invented as well the construction, as the application of parallelograms equal to a given triangle. For whether a triangle, or a quadrangle, or any other quadrilateral figure is given, we may construct a parallelogram equal to it, by the present theorem; since every right-lined figure, as we have previously observed[192], may be essentially resolved into triangles, and we have delivered a method of discovering the multitude of triangles. When, therefore, we have resolved a given rectangle into triangles, and have constructed a parallelogram equal to one of them, and have applied to a given right line, parallelograms equal to the rest; then, by assuming that to which we have made the first application, we shall have a parallelogram composed from these parallelograms, equal to the right-lined figure composed from those triangles, and the thing desired, will be accomplished. Hence, though such a rectangle should be a figure of ten sides, yet, by resolving it into eight triangles, and constructing a parallelogram equal to one of them, and seven times applying parallelograms equal to the rest, we shall obtain the object of investigation. But, as it appears to me, the ancients being incited by this problem, sought how to describe a quadrangle equal to a circle. For if a parallelogram can be found equal to any right-lined figure, it deserves to be enquired whether right-lined figures also, can be shewn equal to such as are curve-lined. And Archimedes shews that every circle is equal to a right-angled triangle, one of whose radii is equal to one of the sides which are about the right angle of the triangle; but whose ambit is equal to the base. However, of this elsewhere: let us now proceed to the consequent propositions.

[192] In the sixth Commentary of this book.