24[X].—L. Fejes Tóth, *Regular Figures*, The Macmillan Company, New York, 1964, xi + 339 p., 22 cm. Price $12.00.

The discrete groups of isometries in the plane are the basis for ornamental patterns. The simplest geometrical representations for them are displayed, as well as ten beautifully colored classic designs based on them.

Their extension to three-space is seen in spherical arrangements and the classical geometrical crystal classes. Since these do not exhaust the permutations of the group parameters, it is necessary to go to hyperbolic space to complete the utilization of all the possible values of the parameters. Their groups are derived, and tesselation examples are displayed.

The regular and semi-regular polyhedra are derived and exhibited in photographs and well-drawn figures. They include the Platonic and Archimedean solids, the Kepler-Poinsot star-polyhedra, and the regular honeycombs. The convex regular polytopes and Euclidean tesselations in all higher dimensions are derived from purely combinatorial considerations.

Problems concerning the most efficient packing of congruent figures in the plane are considered, as well as the most economical covering of the plane by congruent figures. These have technical applications as well as artistic applications. The problems are generalized to the use of sets of non-congruent figures. Also, multiple coverage and corresponding problems on a sphere are considered. The results are compared with biological patterns such as those occurring in pollen grains. The problems in this field are very difficult and many are still unsolved.

Problems in three-space, which involve the properties of polyhedra, include the isoperimetric problems, covering with clouds of spheres, sphere packing, and honeycombs. Extensions to higher spaces are made. Many beautiful results are derived, but there are many promising avenues to be explored.

A six-page bibliography and a good index make the book an excellent reference work.

The excellent three-dimensional anaglyphs in the book-pocket are not mentioned in the table of contents or the index. Their proper use is not explained in the text. For best viewing, these plates should be horizontal with the near edge about a foot from the eyes. They should be viewed through the colored spectacles with the green lens before the right eye and the red lens before the left eye. The line of sight should be depressed about 45°.

A few typographical errors were noted, which the reviewer has communicated to the author. On p. 119, it is stated that Gauss proved that the only regular p-gons that can be made by Euclidean constructions are for those values of p whose odd prime factors are distinct Fermat primes. Gauss did not quite prove this. (See Archibald's note on p. 84 of his translation of *Famous Problems* by Felix Klein.)

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25[Z].—R. Baumann, M. Feliciano, F. L. Bauer & K. Samelson, *Introduction to ALGOL*, Prentice-Hall, Inc., Englewood Cliffs, N. J., 1964, x + 142 p., 24 cm. Price $8.00.