The six-cornered snowflake, by Johannes Kepler. Edited and translated by Colin Hardie, with essays by L. L. Whyte and B. J. Mason. Clarendon Press Oxford, 1966. xv + 75 pages, 1 plate. 21 s.

In 1611 the great astronomer Johannes Kepler published what is probably the most charming New Year's gift that has ever been presented to a man (in this case: the Imperial Counsellor Johann Matthäus Wacker von Wackenfels) by a friend. Wacker is addressed by Kepler as a Lover of Nothing - for what reason, we do not know - , and Kepler therefore presents to him a witty essay about Nix which in Latin means "snow" but in colloquial German stands for "nichts", i.e. "nothing". It is the hexagonal shape of the snowflakes, these tiny, perishable and yet so marvellously organized crystals that attracted Kepler's attention and caused him to speculate about the origin of this particular materialization of symmetry. Reading how he pondered on the problem shows the curious blend between the sober mathematician and the speculative philosopher so typical for Kepler. As a mathematician, he here discussed for the first time the cubical and hexagonal close-packing of equal spheres; as a philosopher he searched, medieval in outlook, for a facultas formatrix, a formative faculty secretly at work.

In the present edition the modernized Latin text is confronted with the first English translation ever made of this lively essay. Kepler's numerous allusions are explained in carefully prepared notes while the synopsis helps the reader to follow his thread of thought. B. F. Mason has contributed an essay on the history and modern explanation of Kepler's problem, and L. L. Whyte examines the sources of his idea of a facultas formatrix. "Strena seu de nive sexangula" by Kepler, in this bilingual edition, is still a precious little gift.

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Strategy for R & D, Studies in the Microeconomics of Development, by Thomas Marschak, Thomas Glennan, Jr. and Robert Summers. A RAND Corporation Research Study published as Volume VIII in the series "Econometrics and Operations Research". Springer-Verlag, New York, Inc. 1967. 330 pages. U.S. $14.20.

The book describes three different approaches to a systematic study of the process of the development of advanced and complicated systems, such as military aircraft. It has been assembled from past studies by the RAND Corporation, without much effort at cohesion.

The strategy concerns the decisions as to how many separate sub-projects should be pursued in parallel, how often they should be reviewed, and when some should be terminated and others continued, or accelerated. The chief objective is to attain a satisfactory prototype with the least possible expenditure of time and money.

The first approach consists of a qualitative study of case histories. It demonstrates that an "inflexible" strategy, which tries to make most of the crucial decisions early and force the development into closely specified channels, will save time and money if the decisions were wise ones, but all too often unexpected events will force abandonment or wholesale revision. More fortunate results generally followed from a "flexible" strategy, keeping several parallel lines open and making decisions late in the process as new knowledge was acquired.

The second approach examines cost forecasts made at various stages in large development programs that have now been completed. They were often very much too low. Two frequent causes of error were a significant change in the number of units ordered, and price inflation. When these factors were