

BOOK REVIEWS

Plea for Reason

Living on the Third Planet. By Hannes Alfvén and Kerstin Alfvén. Translated by Eric Johnson. Pp. viii+187. (W. H. Freeman and Company: San Francisco and Reading, 1972.) \$29.

HANNES ALFVÉN, the creator of magnetohydrodynamics, Nobel Laureate in Physics, 1970, and Kerstin Alfvén are telling in this little book, in the simplest possible language, the story of life on the Earth, from the amoeba to the politician, from the time when the first lung fish ventured on dry land to the population explosion. Not surprisingly, they do not consider the politician the highest form of life on the Earth. They list many excuses for his shortcomings, but they do not mince words about him:

"In times of war they are anxious that the war should not be so 'uncivilized' that it becomes disagreeable to them personally. They would prefer to sit and fiddle while Rome burns."

The Alfvéns end the chapter on the politicians with some sharp words:

"The most pressing need, surely, is to discover which organizational structures can most effectively promote human coexistence in the cybernetic epoch. It seems likely that a totally new structure is needed.

"It is as remarkable as it is depressing that apparently no competent group of people is seriously at work on this problem, a problem on which the fate of the world depends. Most people seem to feel that human destiny is in the hands of the politicians, and that only the politicians can bear the responsibility.

"But if the politicians prove to be incapable of solving our immense global problem, what then will happen?"

"The answer is that eventually another world war will explode."

These pessimistic remarks are backed up by the next chapter on "Man's Increasing Ignorance", on the growing lag between the ever increasing complication of the global system and our understanding of it. Perhaps some of the young people, for whom this book is chiefly intended, will take it to heart and start learning Russian and Chinese.

The scientists, to whom the next chapter is devoted, may represent a

higher form of life than the politicians, but they too receive some well deserved strictures:

"During the Middle Ages philosophy was called *ancilla fidei*, the 'servant of faith'. Today, science is the loyal and usually silent servant of power."

The Alfvéns do not, however, condemn such expensive pranks as the Moon flights, perhaps because Hannes Alfvén is well known as an inspired cosmic speculator and may have a soft spot for space. Disregarding the consensus of most contemporary physicists, they do not consider it impossible that man may in the end emigrate to some other inhabitable planet, they only qualify it with a "perhaps".

The last chapter but one, "The Symbiosis Between Man and Technology", is a moderate expression of ecological pessimism. Ecological systems do not necessarily possess built-in stability. As a lake can die ("autonomously", without human interference), the whole globe might die, unless reason prevails. But how to instil reason into politicians and the military?

"Before any work of great value can be established, there must first be established international groups from all disciplines who are free to cooperate across national borders without pressure from politicians. Should these groups formulate any concrete proposals, the most difficult goal would still remain: namely to put them into practice.

"It is a long and laborious path. But it is the only possible route, and it is essential that we take the first step soon."

It is a weakness of this book that it appeared in Swedish in 1969, so it was presumably written in 1968, but it has not been brought up to date in the English translation. So much has happened in these last four years that a great part of what the Alfvéns say now appears commonplace. Hannes Alfvén was prominent in Pugwash at the time when the book was written; one must conclude that he did not consider Pugwash even as a first step. One wonders whether he would now consider the giant Stockholm Conference of the United Nations, in which he participated, at least as a beginning? At any rate, the ecological conscience of the

world has been powerfully awakened in the last four years, and this may well be a first step. The book was written before the appearance of Forrester's *World Dynamics*, and it would have been interesting to know what the authors think of this first, still very controversial but undoubtedly powerful quantitative approach to the global problem.

I hope that this little book will have such good sales that a postscript can be added soon in the second printing.

DENNIS GABOR

Algebra for Computation

Linear Algebra. By J. H. Wilkinson and C. Reinsch. (Handbook for Automatic Computation.) Vol. 2. Pp. x+439. (Springer-Verlag: Berlin and New York, 1971.) 72DM; \$20.80.

VOLUMES 1a and 1b describe a particular version of ALGOL and its computer implementation. Successive volumes will present basic algorithms in various computational fields. Volume 2, on numerical linear algebra, divides naturally into Part 1, "Linear Systems, Least Squares and Linear Programming," and Part 2, "Algebraic Eigenvalue Problems." Each part has an introduction describing the procedures, followed by contributions with named authors. Contributed chapters have identical patterns — theoretical background, applicability of algorithms, formal parameter list, ALGOL programs, organizational details, numerical properties, and test results and examples.

In Part 1, eleven contributors consider direct methods for systems of linear equations with general (real and complex) and special matrices (symmetric, positive definite, band type), iterative refinement of solutions, conjugate gradients, Householder transformations for least-squares solutions, weighted row elimination, singular value decomposition, and the simplex method with triangular decomposition.

Part 2 includes Jacobi, Householder, QL and simultaneous iteration for dense symmetric matrices, various QR