

the "good old times" of universal knowledge and the "bad times of the two cultures" into which we have degenerated today. Not to have known that the world is a sphere and that there are slightly over ninety elements which can be set up in a periodic table which makes a lot of practical sense, may be considered comparable to his great grandfather not knowing how to read and write. The tendency of Snow to look upon the "good old times" as having been less split into "two cultures" is the same romanticizing error, projecting backwards to a state for the average men which most certainly did not exist.

The second point against the discussion of the "two cultures" as offered by Snow is closely linked to the point raised regarding the role of spiritual leaders. He also ignores the existence of a subconscious common matrix or a collective subconscious as C. G. Jung has called it after a wealth of research. This common substratum is a source of expressions of common patterns which show up in science as well as in all literary products. What does it matter whether the creative scientist realizes consciously or not the identity of the pattern of his work with that of the poet, the artist, or the philosopher? It matters little on the level of the average physicist or artist. It only matters on the level of the spiritual, scientific, and literary leaders, and these are well aware of the great lines and connections among the sciences, philosophy, psychology, literature, the arts, and religion. Just think of the close cooperation between C. G. Jung and the physicist Pauli, the friendship of Dürrenmatt and the physicist Fierz, the fact that Paul Nigii wrote about Goethe and the paintings of Hodler, or the deep interest of Ortega y Gasset in mathematics and physics.

The central problem of today is not whether two or more cultures exist and whether they know, on the average, much or little about each other. These "cultures" always existed in about the same way. The critical event is the fact that the "average man", i.e., the man who, as Snow correctly observes, does not have a satisfactory grasp of the universal

meanings and connections between the diverse expressions of life", e.g., the humanities and the sciences, and he who is not morally mature, nevertheless is accepted in or allowed to obtain public power. In other words: The central problem is not at all one of a separation into two cultures, but one of the "revolt of the masses" as correctly analyzed in 1930 by Ortega y Gasset, in a famous book of the same name (translated into English in 1930 and reprinted in London in 1951 by Allen & Unwin).

Finally, the chapter on "The Rich and the Poor" is an important discussion and offers a dramatic vision of a critical world problem. Although it also largely ignores the problem of leadership and the fact of the "revolt of the masses", it is still worthwhile reading.

As stated at the beginning, this booklet is most stimulating and should form part of the library of most members of "the two cultures", but from the "third culture" it ought to raise some good ideas on possible therapies for the existing social problems.

Research, U.S.A. Knowledge for the Future. By Albert V. Crewe and Joseph J. Katz. 215 pp. McGraw-Hill, New York, 1964. \$18.00.

Reviewed by H. A. Liebhafsky, General Electric Research Laboratory.

The title is broader than the book. The Preface reveals seriatim that "Research, U.S.A." means "the research effort in the United States of America associated with or derived from an interest in nuclear energy"; not all of it, but only the "basic research"; and not all of that, but only "the basic research subsequent to 1958".

The book is dedicated to the memory of President Kennedy; has a Foreword by President Johnson; and consists of photographs, diagrams, and text. Many of the photographs and diagrams, especially those dealing with nuclear physics, are excellent; those showing installations and tools of the Atomic Energy Commission are impressive and thought-provoking; others that show apparatus or substances in test tubes contribute little. The text is marred by occasional errors and oversights, a list of which has been sent the authors.

The ten topics treated are: The New Particles of Physics, Neutrons, Nuclei, The New Periodic Table, Ionizing Radiations and Matter, Radiation and Life, Isotopes in Research, Fusion Research, Major Facilities of the Atomic Energy Commission, Major Tools of the Atomic Energy Commission. The reviewer was impressed by the work on nuclear physics and by that related to life.

The style is not always restrained. The discovery that fluorine combines with some (not all!) of the rare gases "has had a shattering impact". "The noble or inert gases have thus lost their most distinguishing chemical feature, and they have now been fully integrated into the Periodic Table." (p. 91). Let us, at least, be restrained and conclude with "There is much reason to believe that this Niagara of new chemical genetics must inevitably transcend the merely descriptive, and the world may shortly be faced with a scientific revolution that will make previous ones retreat into insignificance." (p. 143).

Many people contributed to the book, and the immense amount of work it covers was done in the laboratories of the Atomic Energy Commission, in research foundations, in universities, and in industry. There are hints of a companion volume on applied research on pages 106 and 130, and President Johnson mentions "volumes" in his Foreword.

The reviewer has no notion why the book was written. It was "intended to be suitable for the non-specialist", who might, as a tax payer, be taken aback to learn that "Based on our experience we have every reason to believe that the rate at which published scientific literature is produced is greater than the rate at which it can be reviewed." (Preface.)

Proper Words in Proper Places. By Irving T. Richards and Paul I. Richards. 206 pp. The Christopher Publishing House, Boston, Mass., 1964. \$3.95.

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We often hear complaints about the bad English used in scientific articles. A recent government report suggests that "Our Scientists and Engineers