CLEVELAND • 130th AAAS

Cleveland Terminal Tower and Cleveland Municipal Stadium.

"Man's unique characteristic among animals is his ability to direct and control his own evolution, and science is his most powerful tool for doing this." This statement by Hudson Hoagland (codirector, Worcester Foundation for Experimental Biology, Shrewsbury, Massachusetts, and president of the American Academy of Arts and Sciences) will be reviewed in one of the special sessions to be held at the 130th Annual Meeting of the AAAS, Cleveland, Ohio (26–30 December). "Science and the new humanism" will be the theme of the Fourth George Sarton Memorial Lecture (28 Dec.) in which Hoagland will discuss man's evolution as an ethical and moral animal and the role that science plays in human progress.

Among Hoagland's thoughts: "We are a product of two kinds of evolution, biological and cultural." Organic or biological evolution has operated by natural selection, eliminating those forms that were not adapted to conditions of their particular time and place. Cultural evolution is a second kind of evolution that is unique to man and its history is quite recent. It originated roughly a million years ago and accelerated markedly in the last 100,000 years with the emergence of *homo sapiens*. This rapid development may have been a result of the advantages that accrued to these animals by natural selection when they applied their brains to solving problems.

There is a suggestive analogy between biological evolution by mutations of genes, on the one hand, and social evolution by novel ideas, on the other. There is environmental selectivity not only to favor the rare gene mutation responsible for biological progress, but also social environmental selectivity to favor new ideas contributing to social progress. Many ideas are harmful and may even be lethal to the individual and to a society, especially when they become institutionalized (slavery, Nazism). As mutant genes may be lethal for a species, so ideas in the minds of men may cause a catastrophe (nuclear war).

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The ethical principles involved in the practice of science are the conviction that there exist objective truth and rules for discovering it. Moreover, on the basis of objective truth, unanimity is possible and desirable and can only be achieved by independent arrivals at convictions, but not by coercion, personal argument, or authority. All scientists must be dissenters and heretics against accepted views in science, if science itself is to advance. Freedom is essential to a scientific society. However, many scientists compartmentalize their thinking; their interpersonal relations, religion, politics, and science are walled off from each other. Thus, for example, excellent scientific work is done in communist countries dominated by authoritarian Marxist dogma.

Many are antagonistic to the humanistic claims of science and regard science from a 19th century view as materialistic and mechanistic and devoid of cultural significance; they assume that by its nature science precludes concepts of freedom and purpose so fundamental to our value system. Scientists operate under the assumption that there is order underlying all phenomena and hope to find the nature of the order, and assume that all forms of order are determined and attempt to discover these determinants.

Hoagland considers our assumption that man has free will and in all human relations accountability is a necessity. Modern society cannot function unless the individuals believe that they are free and yet at the same time responsible for their actions, and unless society can hold them responsible. Our only control of our aggressions in the nuclear age is our ability to think intelligently, to foresee the consequences of our acts, and to control them in terms of our ethical principles.

Also concerned with the scientist, but from a different point of view, is Paul M. Gross (chairman of the Board of Directors and past president of the AAAS). In his AAAS presidential address (28 Dec.), Gross will speak on "The fifth estate in the sixth decade"—the status of science and scientists in the 1960's. In dealing with only certain aspects of this broad subject, he will discuss the greatly expanded tempo, scope, and power evident in the development of science in the past quarter century. Among Gross's considerations will be the increasing role of science and technology as instruments of national policy and the changing organizational pattern of scientific activities and some of its implications. Against the present background of anti-intellectualism, there is a need for a more thorough public understanding of science; he will note the place of science and scientists in our modern social structure and the interactions with that structure. Our changing economy with its heavy emphasis on defense efforts has affected the scientist because teamwork rather than the individual contribution has been stressed.

Of interest to the behavioral scientists, geographers, and sociologists will be the annual illustrated lecture of the National Geographic Society (30 Dec.) entitled "Mozambique, the land of the good people," by Volkmar Wentzel, a member of the Society's foreign editorial staff. While there is hardly a country where Wentzel has not been, he has become known as an expert on Portuguese Africa. During his 15,000-mile journey through Mozambique he traced the route of Vasco da Gama; by steamboat he followed the path of David Livingston up the Zambezi River; and by helicopter he traveled to the interior to explore the Quebrabasa Gorge. The subject matter of his film ranges from wild animals and rough terrain to the sleek skylines of Lourenço Marques and Beira. In addition to the beauty and color caught by his camera, Wentzel compiled both historical and sociological data. Chopi dancers at Mozambique re-enact native legends and a "living" museum of Islamic and Portuguese colonial life was found at Mozambique Island.

More information on the Cleveland meeting will appear in the 6 December issue of *Science*. Complete details will be given in the *General Program*, to be published early in December.

At the Cleveland meeting, Volkmar Wentzel will describe his African experiences. [National Geographic Society]