

Company, died on 31 October while attending meetings of the Society of Motion Picture Engineers in San Francisco.

John Hillyer White, 66, a metallurgist with the New York Laboratories of the Bell Telephone Company for 30 years, died on 30 October.

Albert Sherman Eastman, 64, head of the Chemistry Department, University of Delaware, for 20 years, died on 4 November.

Charles S. Myers, 73, British psychologist, died on 12 October. Dr. Myers was a member of an expedition in 1898 to study the vanishing culture of the natives of the Torres Straits region. Prof. H. J.

Fleure states in *The Times*, London, that: "The idea of that expedition was inspired by a vision of the unity of the sciences studying mankind socially, psychologically, and physically in the past as well as in the present. . . . Myers came back to use his experience in studying his fellow citizens in Britain, and on this basis he built up his valuable work on the guidance of young people in the choice of occupation and on industrial psychology generally." A few days before Dr. Myers' death, the National Institute of Industrial Psychology, which he had founded and of which he had served as head, celebrated its 25th anniversary. Upon this occasion, Sir Stafford Cripps stated that occupational psychology has become "the very core of our problem of production."

Letters to the Editor

Progressive Evolution

Doubt has been expressed by Aldous Huxley as to whether progress has really been of any advantage to mankind. If it isn't good for us, we want none of it, but change is inevitable, and if we don't want progressive change, we are sure to get something else which may not be any better for us. So let us inquire what we mean by progress before we throw it into the discard. Human evolution, as Julian Huxley has emphasized, is actually going on at a greatly accelerated pace in our time. We have become "consciously evolutionary," but where do we think we are going?

Evolution implies change, which may be either progressive or regressive. Progressive organic evolution may be defined as change in the direction of increase in the range and variety of adjustments of the organism to its environment. This involves increase in the complexity of structure, ensuring sensitivity to a greater variety of envioning energies and more refined sensory analysis, elaboration of more varied and efficient organs of response, and more complicated apparatus of central control (nervous, vascular, endocrine, etc.). In the case of the reproductive functions, increase in complexity is in general correlated with the preceding changes in adaptation to diverse modes of life.

These progressive evolutionary changes are primarily in the interest of the individual organism—its survival and enlargement of the range of its activities, with more varied needs and satisfactions. The adaptation of a species as a whole to some particular niche of the environment may or may not be progressive; in the case of many parasites, for instance, it is regressive.

In the human realm these biological factors are operative, but they are in large measure subordinated to psychological factors of different order. Human evolution is essentially social evolution, and increasingly so. Both survival and satisfaction depend upon an efficient social

organization which can be intentionally controlled. Under present conditions in a high culture this control must be by voluntary consent of a majority of the people. Control enforced by tyrannical power is unstable, and it results always in regression. Progress in this realm demands cooperative association with voluntary renunciation of some personal and group advantage and sovereignty. Our needs and desires have grown out of bounds and can be satisfied only by working harmoniously with others for mutual benefits or in lawfully ordered competitive enterprises.

At the moment we seem to be in a back-eddy of regression to bestial standards of selfish concern for personal, group, and national advantage in disregard of social welfare and stability. This can be changed if enough of us want to and are willing to pay the price. It is fortunate that under the surface of our present disorder there is, as there always has been, a strong human craving for decency, justice, and social stability based on individual responsibility for the welfare of the group, and the group has now been enlarged to include the whole world. This key to social progress has not been lost, and it is up to all of us to recognize it and use it.

C. JUDSON HERRICK

236 Morningside Drive, Grand Rapids, Michigan

Addendum to "Cytoplasmic Diseases and Cancer"

Since the appearance of our report (*Science*, 1945, 102, 591), articles written by Graffi (*Z. Krebsf.*, 1939, 49, 477; 1940, 50, 196, 501) came to our attention. In these articles Graffi developed a theory on the derivation of viruses from mitochondria (cf. Graffi's extensive and valuable literature review) and the possible role of mutated mitochondria in the causation of neoplastic diseases, which is almost identical with the views expressed by us. Graffi developed these theories on the basis of a study in which he demonstrated that certain fluorescent carcinogens, as benzopyrene, are absorbed specifically on