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Man and Machines

There is a hard reality behind some of the present-day lurid science fiction: Men have now made machines that are challenging the inborn anatomical and mental limitations of their masters.

Man has studied and speculated about his nature for many centuries. Probably ever since he first saw his reflection in a prehistoric pool he has wondered about himself. Throughout the ages, theologians, lawyers, physicians, philosophers, poets, myth-makers, and more recently anthropologists, psychiatrists, geneticists, physiologists, sociologists, and many other specialists, as well as psychologists, have pondered aspects of the great question "What is man?" None has yet produced the final answer. Not even the most ardent present-day advocates of the usefulness of psychology would dream of maintaining that this one area of study alone can ever give a full reply to this obdurate riddle of the Sphinx. Nevertheless, modern experimental psychology has developed useful techniques and is providing factual, fundamental information about human nature. The present-day relationship between human beings and machines and society is being made more understandable by this science in more than a few respects. When the student of mental reactions is asked, "What are the capacities of human individuals?" his answer today is far from complete, but it is possible to approach an answer in modest, factual terms.

The wise psychologist does not attempt to predict the nature of the end-products of human artistic creation or try to determine the boundaries of man's highest intellectual potentialities or spiritual and esthetic insights. Rather, psychologists try to describe, wherever possible in quantitative terms, basic mental processes, which are often shown to be related to the anatomical and physiological living machinery of a unique primate called *Homo sapiens*.

In general, the information made available as a result of experimental psychology is essential to concrete thinking concerning the present-day changing relationships between man and his world. The engineer who builds a new diesel locomotive is limited by the properties of the materials he uses. The weight, strength, heat resistance, elasticity, and other characteristics of the metals he employs do not predetermine the shape into which the material is to be fabricated. On the other hand, parts of such engines cannot be made of metals that have other than very specific characteristics. The same relationship holds for one who would consider how modern machines and present-day society are related to the inborn traits of every human being. "Which of you by taking thought can add one cubit unto his stature?" also applies to other characteristics than height. A jet pilot cannot by thought, education, or wishing speed up beyond a certain fixed point the time his nerves must take in responding to external stimuli. Anyone concerned with designing new airplanes, or with training pilots to fly such planes in formations, or with developing a better political or economic system must not forget that, physiologically and psychologically, men have a large number of inborn capacities and many specific limitations.—LEONARD CARMICHAEL, *Secretary, Smithsonian Institution.*

This editorial is based on the Arthur Dehon Little Memorial lecture, "Psychology, the machine, and society," given at Massachusetts Institute of Technology, 17 Nov. 1953.