unintelligent waste of the soil he is using, and his irresponsible breeding, the marginal lands remaining every year become more marginal.

The problem *can* be solved, but not by resting on a downy bed of false optimism. (WILLIAM VOGT, *2101 New Hampshire Avenue, N.W., Washington, D. C.*)

I agree entirely with Dr. Yerkes (*Science*, May 2, p. 461) in his defense of the scientific status of psychology and the social studies and in his statement that "the scientific method can be applied to all natural *phenomena*" (italics mine); but I think his attack on the *Endeavour* article, as quoted, somewhat confuses the issue. That science can, with sufficient knowledge of the data, predict "whether a picture will have an aesthetic appeal" as a matter of psychological fact to this or that type of observer I do not doubt for a moment; but as to whether the picture *ought* to call forth a favorable aesthetic response, whether it is *deserving* of such a response, science can say nothing; and I think this is really what the author of the *Endeavour* article is chiefly concerned in conveying to his readers. Science is limited to a consideration of what phenomena *are*, but, regarding what *ought* to be, it can say nothing. In other words, all phenomena have a nonphenomenal aspect which scientific method cannot touch, and the values of goodness and beauty to which the author of the article under consideration refers belong to this extrascientific realm. (JARED S. MOORE, *Western Reserve University, Cleveland, Ohio.*)

Alfred E. Emerson has recently pointed out (*Sci. Mon.*, 1947, 64, 343) that human society is largely governed, not by physiological processes (such as are the inherited determinants of activity in a termite society), but by a symbolism that has to be learned. Mathematics, which Bridgman has said is a human invention, is the most significant element in this learning. It can be said to have created science and its results in the industrial revolution that has pyramided the human population of the earth. (See Karl Sax. *Sci. Mon.*, 1944, 58, 66-71.)

Modern society is therefore mathematically conditioned from top to bottom. Nothing that is not mechanical, *i.e.* nothing that does not conform to Lord Kelvin's definition of science as a knowledge arising from being able to "measure what you are speaking about and express it in numbers," can have any bearing on solving social problems. In none of its forms is life mechanistic. But human society, because it is *not* a "living structure," is mechanistic in the character of what Yerkes (*Science*, May 2, p. 462) notes as "this vast array of recent discovery and of technical applications in various branches of human engineering."

Our social problems are therefore coldly intellectual in the detached manner of science. They belong, I suspect, to the cerebrospinal system which is the directive, not the impulsive, autonomic system, with hormones conditioning its reactions. They deal with, but are not themselves, natural phenomena. They are ethical in character, *i.e.* they concern right and wrong as affected by truth and falsehood in what Northrop (*The meeting of East and West*. New York: Macmillan, 1946. P. 442 ff.) calls "epistemic correlations." They are problems, not in observing behavior as if it were conditioned by inherited "ecto-hormones" (Emerson), but in conditioning behavior by institutions which are the locus of the "free will" thus taken over from the individual as he is constrained, by their logic or illogic, into rational or irrational behavior. It is thus not true that (Emerson, *op. cit.*, p. 344) "the problems of human society are much closer to those being solved by the biologists than they are to those of astronomy or nuclear physics."

Whatever psychology may have accomplished or failed to accomplish is irrelevant socially if it is dealing with natural phenomena under hereditary stimuli. Therefore, a "lack of faith in the applicability of scientific procedures to psychological and social phenomena" is warranted (*contra* Yerkes, *op. cit.*, p. 462), because social phenomena are not natural, *i.e.* they are not psychological, but are intellectual. And intellectual controls are not real, natural phenomena but are ideal, purposive inventions, with social objectives, which may or may not be rational, *i.e.* suited to their purpose.

Any organism can make a bad, even a fatal, choice. But when "all we like sheep have gone astray," we have done it by *thinking* blindly *before* acting blindly, in concert. So, human cooperation is not necessarily beneficent, as is implied by current diplomatic palaver. An irrationally conditioned society cannot promote beneficent cooperation merely because its individuals or leaders wish to do so. Their logical, not their psychological, directives determine the nature of events; and the events do not contain their own causation as in natural phenomena. If they did, prayerful thinking would be quite in order and would be correctly fatalistic.

The historical materialism that is shaping the *irrationale* of the current institutional developments of "socialism" is irrational in its interpretations because it believes, as does Dr. Yerkes (*op. cit.*, p. 461) that "the scientific method can be applied to all natural phenomena" and that social phenomena are natural in their sequences. That this is not true is the central theme presented by Northrop (*op. cit.*, p. 255 ff.) in protesting against the culturalistic fallacy of trying to derive a normative theory from the factual theory of social "science."

Thus, the "hosts of us who are now classified as scientists" may well be "self-deceived workers who, unlike our physical science colleagues, are denied access to the truth concerning the natural phenomena which particularly interest us" (Yerkes, *op. cit.*, p. 462)—because they simply are not natural phenomena! The social psychologist, arbitrarily placing all events in the natural field, destroys the realistic epistemological dualism in philosophy upon which an effectively integrated science depends.

"Culturology" (see L. White. *J. Wash. Acad. Sci.*, 1947, 37, 181-210) may well serve as an escape from the egocentric predicament of the personal, psychological approach to social problems; but it seems certain that its rationale can only be, not that of a new empiricism, but simply the timeless metaphysical disciplines of philosophy and logic. We shall come to see mathematics as a cultural artifact or "human invention." As such, it represents a social device for choosing, not ends, but means; nor is it an "illusion of omnipotence" to recognize it as the ultimate in social recourses. Its logic is, indeed, compelling; but who would say that the laws of reason are as unbreakable in human society as are the laws of motion in the "infinite meadows of heaven"? Truth is not a robot! (ALDEN A. A. POTTER, *R.F.D. 3, Bethesda, Maryland.*)