# Letters

## Culturology

It may be of interest to readers of *Science* to learn that *Webster's New International Dictionary of the English Language* has included, in the addenda to the second edition (1954), the new name of a moderately old science—namely, *culturology*.

The science of culture (dealing with customs, institutions, beliefs, languages, arts, tools, and so on—in short, those characteristics which distinguish the human species from all others) was first defined, and its scope was first outlined, by the eminent English anthropologist Edward Burnett Tylor (1832–1917), in "The science of culture," the first chapter of his great work, *Primitive Culture* (1871). The scientific study of customs, beliefs, languages, and artifacts, both modern and prehistoric, has, of course, been the chief occupation of many cultural anthropologists—ethnologists and archeologists—since Tylor's day, and even long before.

But much of the work of anthropologists is not concerned with culture at all, but with the fossil remains, bones, muscles, genes, physiological processes, and so on, of men and other primates. And many "cultural" anthropologists have occupied themselves with nonculturological, psychological, psychoanalytic, and sociological (focusing upon social interaction among human beings) problems. The need arose, therefore, for a term that would distinguish the science of culture from other kinds of studies carried on by anthropologists. *Culturology* suggested itself in the tradition of scientific nomenclature that has produced *mammalogy, parasitology, mineralogy,* and so on.

*Culturology* was introduced into anthropological literature in 1939 in an article of mine, "A problem in kinship terminology" [*Am. Anthropologist* **41**, 571 (1939)]. It was given greater currency in 1949 in my book *The Science of Culture*. The first person to use this term, however, as far as is known, was a distinguished German chemist, philosopher, and Nobel prize winner, Wilhelm Ostwald (1853–1932), in *Energetische Grundlagen der Kulturwissenschaft* [(Leipzig, 1909), p. 112]. Later, in "The system of the sciences" [*Rice Inst. Pam.* **2**, No. 3 (1915)], he defined this concept more fully [see L. A. White, *The Science of Culture* (1949), pp. 113–117; 409–415]. I did not discover Ostwald, however, until 1949, some 15 years after I had begun to use *culturology* in my lectures.

The term *culturology* has encountered adverse criticism and opposition. Among other things, it has been called "a barbarism," an epithet applied in years gone by to *sociology* by some of Herbert Spencer's friends in an attempt to dissuade him from using this word (see H. Spencer, *Principles of Sociology,* vol. 1, preface). By "barbarism" they were alluding to the fact that *sociology* is derived from both Greek and Latin sources—as is *culturology*—and this, according to the late V. Gordon Childe, is something that one reared on *litterae humaniores* finds objectionable. But, over the years, *sociology* won acceptance and has now become commonplace. Also, the English language itself has been quite hospitable to hybrids of Greek and Latin derivation, such as *penology, dictaphone, television, jurist, socialist, deist, scientist, petroleum,* and *cablegram.*

Because *culturology* is so apt, specific, and precise; because it is homologous with other names of sciences (for example, *parasitology*); because the English language has a genius for assimilating newly coined words (for example, *dictaphone*); and, finally, because *culturology* is needed to distinguish the science of culture from psychological and sociological studies of human beings, its general acceptance and use may be confidently expected. *Culturology* was included in the *Dictionary of Anthropology* (New York, 1956) by Charles Winick, and one finds it occasionally in anthropological writings. Instances of its use will undoubtedly multiply in the future.

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## Names for Binary Numbers

The reading of "A system of names for binary numbers" in a recent issue of *Science* [**128**, 594 (1958)] impels me to describe another system devised some 6 or 7 years ago by the late D. A. Flanders, in line with some suggestions made by J. W. Givens. At that time the AVIDAC for the Argonne National Laboratory and the ORACLE for the Oak Ridge National Laboratory were both in the early stages of their construction, and we felt some concern for the problem of becoming familiar with their arithmetic to the base 2. In more practical terms, it was a question of getting used to the base 16, since it was convenient to group the binary digits together into tetrads.

The Givens-Flanders system was simplicity itself: Vowels and consonants were selected, each to represent one of the four binary pairs according to the following scheme:

| | | |
|---|---|---|
| n | o | 0 0 |
| k | a | 0 1 |
| r | e | 1 0 |
| s | i | 1 1 |

A consonant is always to be followed by

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