Church's argument is logical if one assumes that the present state of research on developmental changes in perceptual constancy is indeed inconclusive. In Osgood's discussion, the confusion results from considering size and brightness constancy together. Since it has been demonstrated that the different constancies are most probably mediated by different mechanisms [H. Leibowitz, P. Chinetti, and J. Sidowski, *Science* **123**, 688 (1956)], it seems advisable to evaluate size constancy separately. In this context, the studies cited by Osgood as well as the more recent experiments referred to in our original note indicate that size constancy does improve with age, especially for distant objects. On the basis of this evidence, we were led to suggest the hypothesis proposed in the original note rather than the alternative possibility that was suggested by Church.

Church has also suggested that individuals who habitually make discriminations with respect to objects outside of the horizontal plane may demonstrate a decreased moon-illusion effect. We have made no systematic observations on this point, but it is relevant to mention that two of the 19 adult subjects demonstrated no illusion effect whatsoever. Upon further questioning, it was revealed that one of them had worked as a forest ranger while the other is an amateur pilot. Further experimentation is certainly indicated, but the available data are in agreement with part of Church's hypothesis.

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Ethology and Psychology

The title of the Sixth International Ethological Conference, recently held at Cambridge University, again focuses attention on the problem of what to call the rapidly developing science of animal behavior. The term *ethology* has been defined by Tinbergen [in B. Schaffner, Ed., *Group Processes* (Macy Foundation, New York, 1955)] as "the biological study of behavior." Since psychology in its modern sense is often defined as "the science of human and animal behavior," it is obvious that these two terms overlap and may be almost identical.

This presents the possibility of a jurisdictional dispute as well as an unreal dichotomy of subject matter, and one wonders why a new term should be needed. The answer lies both in the history and in the professional organization of science. Psychology has concerned itself primarily with human be-

havior and only secondarily with the behavior of the rest of the animal kingdom. On the other hand, a zoologist who concerns himself with animal behavior does not like to call himself a psychologist, nor does the term *animal behaviorist* fit with the usual nomenclature of subdivisions of biological science. There is no term equivalent to "behaviorology"; this is one case where the Greeks did not have a word for it.

Both *ethology* and *psychology* are unfortunate terms because of their derivation. *Ethology* originally meant the science of character, whereas *psychology* meant the science of the mind. Thus, both are based on primitive scientific concepts which no longer have much use and do not describe modern science. In addition, *ethology* is very similar to *ethnology*, a term long used in a purely human context to describe studies of race. According to J. R. Charles, it is linguistically permissible to pronounce *ethology* with a long *e*, and this should be done in order to make a greater phonetic distinction between it and *ethnology*.

There are two conventional ways of subdividing the study of biology. One of these is on the basis of taxonomic groups—that is, ornithology, entomology, bryology, and so on. The other, a more basic one, is based on phenomena observed on different levels of organization, with ecology at the topmost level and genetics at the lowest, and with developmental biology (or, as it used to be called, embryology) cutting across all levels. The phenomenon of behavior, defined as activity of an entire organism, occupies a central position on the organismic level. Its study involves factors operating at all levels of organization, and this provides a natural way of unifying zoological science. The scientist who studies behavior is likely to be by training a geneticist, a physiologist, an ecologist, or a sociologist as well as a psychologist, and he cannot work effectively without some appreciation of factors affecting behavior on other levels. This interdisciplinary nature of the study of behavior has been often recognized in terminology by combining the names of different fields of science—for example, *psychobiology, sociobiology, psychogenetics, physiological psychology, social psychology*, and so on. Most of these terms still describe a field of interest rather than a profession, although they may eventually develop into the latter.

No one can dictate what the eventual usage will become. However, certain principles should be kept in mind. One is that we should define whatever names we give to the science of animal behavior in the broadest possible way, recognizing that this science deals with general phenomena affected by many different sorts of factors and cutting across the conventional boundaries of professional training. Thus, *ethology* should be defined as the study of behavior of all animals, including man, thereby being a term equivalent to *psychology* rather than excluding it. It would be unfortunate for the development of the science if it were confined to the study of instinct and thereby became merely one of the already numerous minor schools of psychology.

It is also possible that workers in the field of animal behavior will find that their concepts have gone beyond the original narrow definition of their science, just as did the embryologists, who found that development did not cease with embryonic life but proceeded into old age and death. By analogy, the science of animal behavior might become known as "behavioral biology."

More important than terminology, however, is the existence of important behavioral phenomena and concepts explaining them which tend to eliminate the somewhat artificial divisions of zoological science which have hitherto been used in the organization of professional training.

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