among the *D. tigrina*, they would have been sated at the time of testing and attacks upon the *C. foremani* would not have been observed. Thus, the probability of predatory attack of immature *D. tigrina* upon *C. foremani* must be much greater than the probability of attack upon each other. Nor were *C. foremani* observed to attack each other. Yet both species will attack and eat a wide variety of other small organisms—for example, *Tubifex* worms, mosquito wrigglers, and brine shrimp—and large, sexually mature *D. tigrina* will attack and eat smaller immature *D. tigrina*. Thus, even among the planarians, which are about the most primitive animals possessing a real central nervous system, there is considerable specificity in regard to predatory behavior directed against close relations. The cues inhibiting or releasing such behavior in planarians are still largely unknown.

Hypotheses *A* and *B* imply different sets of consequences, and these consequences could be used to distinguish which of the hypotheses is valid. To decide between them one might ask the following questions.

1) Within the set of animals having the physical capacity to kill and eat a member of their own species, is the incidence of cannibalism in a species positively related to the diversity of other species preyed upon by the members of the species in question? Hypothesis *A* would imply no such relation; *B* would. Consider Hailman's own citation of the fact that owl siblings kill and eat one another. Apparently siblings of less voracious predators do not. Why? As a teleological mechanism to adjust population to food supply, cannibalism should be equally useful for all species.

2) Is cannibalism as frequent among predators and omnivores that hunt and travel in packs as it is among those that are solitary hunters when the breadth of prey spectrum between the two types is comparable? I do not believe hypothesis *A* would predict any essential difference. Hypothesis *B* would predict a higher probability of cannibalism among the solitary hunters when they are placed together, because group living would favor the evolutionary selection of more powerful inhibitory mechanisms against cannibalism.

3) Among those species which are physically incapable of eating other members of their own species but which do possess the capacity to kill other members of their own species, does one observe an enhanced rate of killing of members of their own species in the absence of an adequate food supply? According to *A* one should, since the advantages of such an action as a population regulator are as effective as cannibalism; *B* would predict that one would not.

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Systematic Collections

Before the regulation on deposition of types proposed by the conferences on systematic collections [A. B. Grobman, *Science* **131**, 938 (1960)] is put into effect, "stable institutions" should be required to obtain from some properly qualified and independent authority a statement certifying just which kinds of organisms now are adequately curated and will be so curated in the future. Duplicating curatorial concentration on certain favored groups is so great as to warrant more than a suspicion that staffs of all such stable institutions in North America, even if combined, would not be in a position to look after specimens of every sort of extant organism. Institutions desiring certification also should be required to prove that they know how to retain specimens in a condition to function with some degree of usefulness as types, or else that they are en-

gaged in research to such an end. Types of one economically important but neglected group, common almost everywhere in the world, usually are in the same sort of pickle (literally and figuratively) as they were a century ago, but if they are not, then they are in a still less satisfactory condition. All such types are slowly deteriorating. No effort is being made, so far as I know, in any stable institution anywhere in the world, to discover better techniques for preserving these animals.

The certifying authority also should be required to satisfy itself that the museum rules regarding types really will promote the advance of knowledge. One of several instances that can be cited is as follows. Species *x* was erected in 1871 on the basis of a single specimen, of which only the external characteristics were described, and those all too briefly. The authority on the group examined the type in 1888 but could add no information of importance, for he was not permitted to make a dissection. The species can belong to any one of six genera distinguishable from each other only by their internal anatomy. Each of some dozen monographs has had to waste space in vain repetition of the little that was known 70 years ago about this species *incertae sedis*.

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Without reviewing the substance of Gates' remarks, with which I am in substantial agreement, I should like to point out that the conferences referred to did not discuss "regulations," "certification," or "certifying authorities." The conferences adopted some resolutions which I regard simply as recommendations to appropriate authorities by a group of informed specialists. No legalisms were implied.

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Visual Effects

The photograph of the Arizona Meteor Crater on your cover for 22 July is excellent for the well-known demonstration of the effect of inverting the image. Held upside down, the crater appears to be a great mound. What makes this photograph especially good is the fact that it is taken from such a high point that the horizon does not show. Most astonishing effects may be obtained by holding the picture about 18 inches from the eyes and rotating it smoothly, at a rate of about 360° per minute, either clockwise or counter-