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LETTERS

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Passive Voice and Personal Pronouns

R. V. Ormes' judicious criticism of the passive voice [*Science* 125, 529 (1957)] reminded me, by contrast, of my own too sweeping indictment of it a year ago. A young chemistry major took my remarks seriously and wrote a formal account of experimental procedure entirely in the active voice, using the first personal pronoun. The result was revealing. At least it convinced me that the passive voice is sometimes preferable to the active, and that criticism of it should be confined, like Ormes', to its abuse.

To illustrate, here is a passage on procedure, chosen at random from the *Journal of the American Chemical Society*. The original reads: "The thick oil was dissolved in ether, the solution was extracted twice with dilute alkali, and the combined basic extracts were washed with ether. The ether solutions were combined, dried and evaporated to give 2.8 g. of starting alcohol. The basic solution was acidified with dilute sulfuric acid and extracted with ether. The ether layer was washed with water. . ."

Recast in the active voice, with the first personal pronoun, it reads: "We dissolved the thick oil in ether, extracted the solution twice with dilute alkali, and washed the combined basic extracts with ether. We combined the ether solutions, dried them, and evaporated them to give 2.8 g. of starting alcohol. We acidified the basic solution with dilute sulfuric acid and extracted it with ether. We washed the ether layer. . ."

Except for the opening sentence, the original version is superior, primarily because it places the emphasis where emphasis logically belongs: on the process rather than on the agent. Coherence is better too: in the original, the substance named at the end of one sentence tends naturally to become the subject or subject modifier at the beginning of the next ("... ether. The ether solution . . ."); in the revision, the reader is constantly brought back to "we" before he learns the next step in the on-going process.

But having stated the obverse or counterpart of Ormes' position with regard to the passive voice, I should like only to reinforce his position that the first personal pronoun is not an invariable sign of immodesty or subjectivity; sometimes considerations of objectivity

and responsibility, no less than of style, demand its use. Certainly avoidance of it is no guarantee of virtue; I recall one immodest self-reference that went something like this: "Analysis of this problem is difficult, but after long deliberation, it was decided by this analyst to. . ." Even worse is the pretense that beliefs are held and assumptions are made without danger of contamination from human fallibility. "It is assumed" may be quite all right for reminding a reader of assumptions customarily understood when certain equations are used, but the reader should know when the assumptions are original, and the simplest way to tell him is by saying "I have assumed. . ."

After all, human agents are responsible for designing experiments, and they are present in the laboratory; writing awkward phrases to avoid admitting their responsibility and their presence is an odd way of being objective. P. W. Bridgman (*Reflections of a Physicist*, 1950, pp. 57-58) puts it even more strongly: "In suppressing these personal expressions I am doing an unnatural thing that sometimes demands obvious circumlocutions and always involves an element of convention and construction. If I want to express what obviously occurs, I have got to use the first person. Has it ever been adequately proved, or has ever the assumption been adequately examined that in forcing myself to speak non-personally I have not thrown away something vital?"

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University Responsibilities and Government Money

I agree very definitely with Paul Klopsteg [*Science* 124, 919 (1956)] that the danger of government sponsorship of research is that of violation of the integrity of the universities in their research programs. However, the proposals and the suggestions made by Klopsteg are, in my opinion, diametrically opposite to those which would solve the problem.

In principle, Klopsteg proposes that whenever funds are granted to an institution for a particular project by a government agency, these funds should cover only part of the costs, and the remainder of the costs should be supported from the university's research funds, thus fulfilling the obligation of the university to support research. That this method of operation would lead toward the domination of the over-all research activity of an institution by granting agencies can be made clear by the following example.

Let us assume that a given institution has a total of \$100,000 (including overhead) to distribute among its various research activities. In the absence of a granting agency, the institution can