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into being we would not only see these "shelters," we would undoubtedly before long be forced, under threat of imprisonment, to enter and remain in them during public participation drills. In a word, then, this would bring nuclear war home; way home. H.M., in a lesser point, argues that this may be good; perhaps it will alert people to the horror. Strange then, is it not, that precisely those newspapers and politicians undistinguished in their advocacy of peace are pushing "shelters" with something akin to panic.

Speaking of distinguished advocacy and of the arms race in general, which appears to be what H.M. wants to do, as a latter-day romantic I am easily stirred to passion, yet I find in all the issues of *Science* I have read in the past several years no clarion calls on any particular facet of the arms race. I do find bemoaning aplenty and cynical denigration of the efforts of some frequent (as in the editorial on the Report of the Committee on Science in the Promotion of Human Welfare).

As for the analogy H.M. presents in his final paragraph, I too, along with other irrational folk, would be vastly disheartened if, in addition to seeing the extensive lifeboat preparations, I knew that for some time this ship had been steering a course, with increasing speed, that would lead it to collision with another ship and that the "rational" passengers on both liners were doing nothing to force their captains to change course.

EUGENE KAELLIS

775 Avenue Z.

Brooklyn, New York

### General-Purpose Computer

The issue between Reitman and those he represents and certain statements in *Computers and Common Sense* which he says "are simply untrue" [*Science* 135, 718 (2 Mar. 1962)] can be summed up in Reitman's reiteration that "it [the General Problem Solver machine] does in fact exist, even as you and I." Since "you and I" certainly exist as something other than a program in a general-purpose computer (or the mind of God), the question, "Whose statements are untrue?" resolves itself.

To bring this point home, let me say that we are prepared to buy a general problem solving machine and are most anxious to secure the franchise for



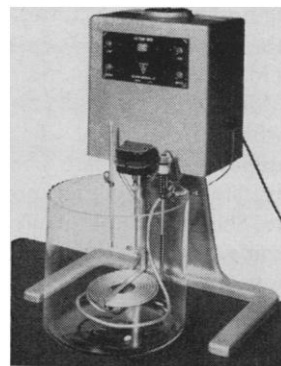
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Washington, which we think needs such machines very much. I hope Reitman can quote us a price and delivery date.

The definition of learning to which Reitman objects is based on Sherrington's physiological distinction between habit and reflex, a matter which has lately been discussed in the pages of *Science* [132, 555 (1960)].

I plead guilty to having missed the important scientific journal *En Passant*, published by the Pittsburgh Chess Club; but Reitman should also plead guilty to having missed or disregarded Richard Bellman's charge in *Operations Research* (May-June 1958) that his colleagues, Simon and Newell, have made claims which are both unscientific and irresponsible.

Finally, since Simon is dean of the Graduate School of Industrial Administration at which Reitman is employed, I question the scientific objectivity of the review. An attorney or judge in similar circumstances would disqualify himself, but I seem to have heard recently that American scientists are growing more and more insensitive to the problem of conflict-of-interest.

MORTIMER TAUBE

4827 Rugby Avenue,  
Bethesda, Maryland

Since Taube's letter provides four quite representative illustrations of the techniques he uses in his book to support his theses, it will be helpful to consider his comments in some detail.

On the face of it, one might suppose it sufficient to reply to his first two paragraphs by noting that the sense in which the General Problem Solving Program (GPS) exists is exactly the same as the sense in which the production scheduling, inventory control, and data processing programs of the business world exist—as sets of instructions for general-purpose digital computers. If Taube wants his own GPS, he has only to request the program from Newell, Shaw, or Simon, rent time on an IBM 7090, and run to his heart's content.

Actually, Taube's little discussion of the varieties of existence is something of a red herring, which he waves before us while he beats a quick retreat from the position he took in his book. There (pp. 59–60), far from admitting that GPS and the Chess Player exist as programs for a general-purpose computer (which is all Newell, Shaw, and Simon claim for them), Taube asked his readers to believe that “all the great



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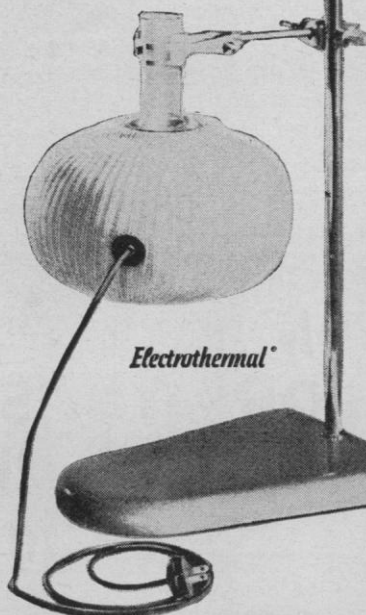
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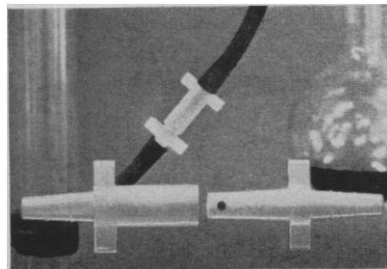
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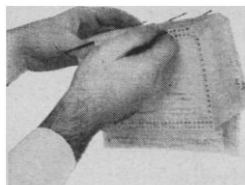
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mechanical brains, translating machines, learning-machines, chess-playing machines, perceiving machines, etc., accounts of which fill our press, owe their 'reality' to a failure to use the subjunctive mood. The game is played as follows: First, it is asserted that except for trivial engineering details, a program for a machine is equivalent to a machine. The flow chart for a program is equated to a program. And finally, the statement that a flow chart could be written for a nonexistent program for a nonexistent machine establishes the existence of the machine. In just this way . . . Simon, Shaw, and Newell's 'General Problem Solver,' and many other nonexistent devices have been named in the literature and are referred to as though they existed."

In my review I noted that Taube simply denied the existence of these and many other running programs which disproved his charges. The citation given above demonstrates this. Since Taube now apparently admits the existence of these programs, it seems reasonable to suggest that he might reexamine his previous conclusions about the status of research on artificial intelligence.

Taube's third paragraph—a good example, incidentally, of the "Emperor's new clothes" technique he outlines in his book (p. 120)—is perhaps the most disingenuous of the five. The reader should consult the reference Taube cites to substantiate the acceptance he claims for his definition of learning. It consists of exactly one paragraph in, of all things, still another letter to the editor of *Science* from Taube. Better yet, even this one paragraph contains no reference to learning as a "change from conscious to unconscious (habitual) activity to attain a desired goal," or to anything remotely related to this definition. The word *conscious*, the heart of Taube's definitional distinction between human and computer learning, is nowhere to be found in the letter.

The key to Taube's fourth paragraph, as is the case with the third, again is to be found in what he neglects to say. Bellman is protesting four *predictions* by Simon and Newell of developments they anticipate over a 10-year period. Nowhere in his note does he suggest, as Taube does, that GPS or the chess-playing program "owe their 'reality' to a failure to use the subjunctive mood," or that Newell, Shaw, and Simon are in any way claiming to have done more than they actually have. This distinction between what Bellman charges and



what Taube implies he charges is fundamental. It is only by ignoring such distinctions that Taube can ask his readers to believe that the whole field of artificial intelligence resembles nothing so much as a 19th-century hoax.

All in all, the first four paragraphs of his letter provide a fair sample of the ways in which Taube constructs arguments out of the appearances of evidence. They are worth some reflection when the reader of *Computers and Common Sense* encounters (p. 127) Taube's statement that "this book is soundly based on the maxim that 'Ye shall know the truth, and the truth shall make you free'; and on an abiding faith that the process of rational inquiry and the increase and diffusion of knowledge are the noblest ends of man." As for the fifth paragraph, in view of the foregoing discussion, I find it difficult to be moved by Taube's lament at the corrosion of my virtue by the conditions of my employment. For, despite his concern with the scientific objectivity of everyone else in this area, it seems rather evident that somehow or other he has pretty much lost sight of his own.

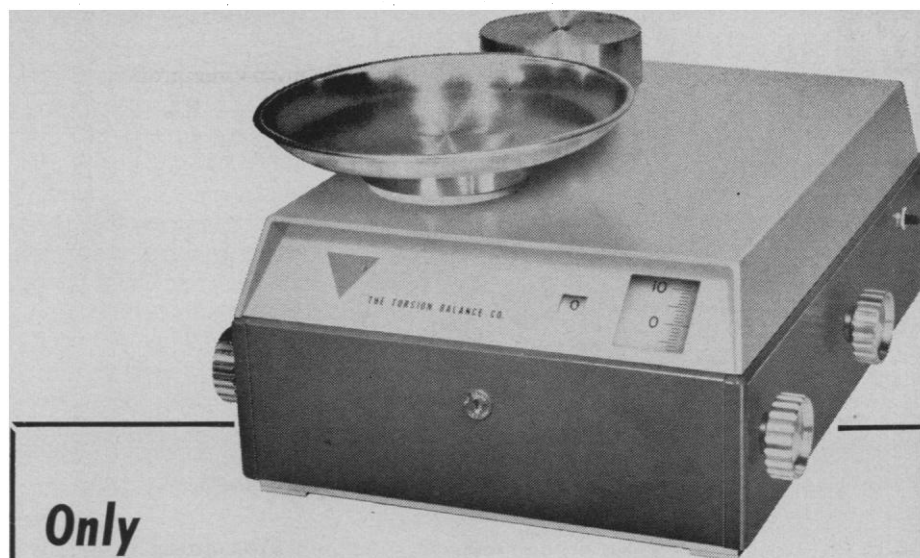
WALTER R. REITMAN  
Carnegie Institute of Technology,  
Pittsburgh, Pennsylvania

### Financing of Medical Care for the Aged

I have just finished reading the news item entitled "Medical care: changes in the political terrain" [*Science* 135, 90 (12 Jan. 1962)].

At the bottom of column 2 is a sentence which states, "Last week, the Hospital Association's House of Delegates voted to approve the Social Security financing of care for the elderly, provided that the program would be administered through Blue Cross."

This statement is not accurate. In a statement of "Actions Taken—January 4, 1962—in Chicago, Illinois" by the American Hospital Association House of Delegates and by Blue Cross Association Member Plans, point 3 under the heading "American Hospital Association House of Delegates" reads as follows: "We recognize that government assistance is necessary to effectively implement this national Blue Cross proposal in order to enable many retired aged persons to purchase this health protection through the voluntary



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