

AMERICAN ASSOCIATION
FOR THE
ADVANCEMENT OF SCIENCE

Board of Directors

THOMAS PARK, *Retiring President, Chairman*
PAUL M. GROSS, *President*
ALAN T. WATERMAN, *President Elect*
HARRISON BROWN DON K. PRICE
HENRY EYRING MINA REES
H. BENTLEY GLASS ALFRED S. ROMER
MARGARET MEAD WILLIAM W. RUBEY
PAUL A. SCHERER, *Treasurer*
DAEL WOLFELE, *Executive Officer*

Editorial Board

KONRAD B. KRAUSKOPF H. BURR STEINBACH
EDWIN M. LERNER WILLIAM L. STRAUS, JR.
PHILIP M. MORSE EDWARD L. TATUM

Editorial Staff

DAEL WOLFELE HANS NUSSBAUM
Publisher Business Manager

GRAHAM DU SHANE

Editor

JOSEPH TURNER ROBERT V. ORMES
Associate Editor Managing Editor

ELLEN E. MURPHY, *Assistant Editor*

NANCY TEIMOURIAN, *Assistant to the Editor*

News: HOWARD MARGOLIS, DANIEL S. GREENBERG,
PATRICIA D. PADDOCK

Book Reviews: SARAH S. DEES

Editorial Assistants: NANCY S. HAMILTON, OLIVER
W. HEATWOLE, EDGAR C. RICH, JOHN E. RINGLE,
CECIL F. SWEENEY, CONRAD YUNG-KWAI

Staff Assistants: LILLIAN HSU, MARION Y.
KLINE, KAY E. KROZELEY

Advertising Staff

EARL J. SCHERAGO, *Director*

HAZEL SANDS, *Production Manager*

Sales: RICHARD L. CHARLES (New York, N.Y.,
PE 6-1858); C. RICHARD CALLIS (Old Bridge, N.J.,
CL 4-3680); HERBERT BURKLUND (Chicago, Ill.,
DE 7-4973); ED BIG (Monterey Park, Calif.,
CU 3-8600)

SCIENCE, now combined with THE SCIENTIFIC MONTHLY, is published each Friday by the American Association for the Advancement of Science at National Publishing Company, Washington, D.C. SCIENCE is indexed in the *Reader's Guide to Periodical Literature*.

Editorial correspondence should be addressed to SCIENCE, 1515 Massachusetts Ave., NW, Washington 5, D.C. Manuscripts should be typed with double spacing and submitted in duplicate. The AAAS assumes no responsibility for the safety of manuscripts. Opinions expressed by authors are their own and do not necessarily reflect the opinions of the AAAS or the institutions with which the authors are affiliated. For detailed suggestions on the preparation of manuscripts, see *Science* 125, 16 (4 Jan. 1957).

Advertising correspondence should be addressed to SCIENCE, Room 1740, 11 West 42 St., New York 36, N.Y.

Change of address notification should be sent to 1515 Massachusetts Ave., NW, Washington 5, D.C., 4 weeks in advance. Furnish an address label from a recent issue. Give both old and new addresses, including zone numbers.

Annual subscriptions: \$8.50; foreign postage, \$1.50; Canadian postage, 75¢. Single copies, 35¢. School year subscriptions: 9 months, \$7.00; 10 months, \$7.50. Cable address: Advancesci, Washington.

But You Have Premises To Keep

The recognition given Robert Frost these days continues to grow. He was appointed poet in residence to the Kennedy Administration; selections from his latest volume made 10 pages in *Life* magazine; and now an analysis of his early poem "Stopping by Woods on a Snowy Evening" has been programmed—that is, the analysis has been arranged in a series of items suitable for use in a teaching machine or in a special textbook. The poem and the program, together with a poem by Thomas Hardy and its program, are offered in a little booklet, *Poetry 230*, published in a tryout edition by Harcourt, Brace and World. Plans call for general publication of a revised and expanded version sometime next year. Enthusiasm for programming is fine and enthusiasm for poetry is equally commendable, but before combining these enthusiasms there are a few things you should bear in mind.

On the cover of the booklet it says, "Programmed instruction in reading poetry in depth." And inside there is the requisite series of items. Each item consists of a sentence or two, with a word or two missing, which the student, on the basis of a hint or two furnished by the context, is supposed to be able to supply correctly. The correct answer, as a check for the student, is then given on the following page, along with the next item. For example, one item in the booklet reads: "Even Frost would probably not have forced so much rhyme on himself if he had planned a long poem. Since he doubtless had a hunch that this was to be a _____ rather than a long poem, he decided to increase the difficulties of his rhyme game still more."

The word *short* is missing, but so is something else. What is also missing is the careful analysis that should go into preparing these items. Programmed instruction, it is true, supplies hints to enable the reader to respond correctly. But the basis for a hint is supposed to be something more than the redundancy of a sentence made redundant for no other purpose. The student should be helped, but he should be helped to do something, for example, to generalize from one situation to another. The items, moreover, are supposed to form a sequence, each item leading to the next. The present item is not part of such a sequence, and it is hard to see how it could become a part without considerable reworking. In fine, this is not a program at all.

A little programmed learning is a dangerous thing. But better understanding would not mean doing a better job; it would mean not attempting the job in the first place. Not everything ever written is suitable for programming. *The Federalist* papers are not suitable; neither are Durrell's novels, nor the *Washington Post*, nor the little essay on Frost by the poet and critic John Ciardi on which this effort is based, nor even the tables, drawings, and diagrams that adorn some of the instruction in scientific fields which has been satisfactorily programmed.

Programmed instruction has a distinctive format, but it is also based on underlying premises. The temptation, with the great pressure in education these days to be modern and technical-looking, is to imitate the format and ignore the premises. It is not necessary, however, to be an expert in programming to suspect that something is amiss with *Poetry 230*—although without such knowledge you might be inclined to denounce all programming. It is necessary only to appeal to premises of the most general sort. There should be warning enough in the contrast between the pretentiousness of this exercise and Frost's poem itself, 16 short lines of simple narrative.—J.T.