statistics had value, then still overlooked would be the differing emphasis on education in the two cultures. Shape, form, design, or construction of written language is but one element in a total complex of motivation.

None of these remarks is meant to degrade the value of the authors' study in highlighting the inadequacy of current methods of teaching children to read.

MALCOLM J. BROOKES
Human Factors Design and Research, Inc., 342 Madison Avenue, New York 10017

Brookes attempts to interpret the findings of Rozin *et al.* solely as effects of differential motivation. As stated in the report, we agree that the novelty of these materials may have contributed to our success in teaching them to children who may have "turned off" to regular reading instruction. Further, as has been pointed out to us by Brookes, the unitary appearance of Chinese symbols, in contrast to the sequence of visually discrete elements in English orthography, may also contribute to the superiority of the Chinese. However, we believe that the children's success with the Chinese material must in part be explained on cognitive grounds: Chinese orthography maps directly onto meaning, whereas in English orthography the relation of sign to meaning is mediated through the sound system. The results of our study are consistent with such an interpretation; when the mapping is directly onto meaning, there is no problem with acquisition beyond sheer memorization of the symbols. We duly noted that this memorization problem will rapidly become intrusive, so that a whole-word method is eventually unworkable. We suggested, finally, that the syllable, rather than the relatively abstract "phoneme," was the appropriate unit for introducing the child to the critical feature of our orthography—namely, that the mapping is through the sound system. Brookes argues that a change in unit will have no effect because the problem is simply motivational.

Preliminary results of current work by Gleitman and Rozin (*1*) suggest that Brookes is incorrect. In about 5 hours of instruction we have successfully taught 5-year-old inner-city children (i) a set of 21 syllables (such as *can, o, pen, er, wind*) and (ii) the general principle of combining them (as in *can o-pen-er, wind-o*). These children had had an opportunity to be "deactivated" by failure in reading, since they had previously been exposed for 8 months to a "phonic" method without discernible learning of any combinatorial principle, despite fairly intensive training in a charming and creatively managed kindergarten. The syllabary method works by separating the two conceptual problems for the child, rather than muddling them into one. First, we teach the child the fundamental fact about reading English—that orthography tracks the sound system—using readily accessible phonological units (syllables). We then show him that these can be combined to yield meaningful words. Much later we try to show him that the abstract phonological unit represented by the alphabetic sign is an efficient mnemonic for the inconveniently large (for English) set of syllables. It is fair to note that this work has been done with a simplified orthography, which is part English and part rebus, and that the number of subjects is so far small. Yet it seems safe to say that the syllabary approach—independent of admitted motivational issues—increases the speed of principled reading acquisition. Data on speech perception and production, which were cited in the report of Rozin *et al.*, also indicate that syllables are much easier to identify in the sound stream than "phonemes." This bolsters our contention that the syllable is a logical first step. We agree with Brookes that the cross-cultural evidence cited by Rozin *et al.* is debatable, but, taken together, such facts as the rapid success of the Cherokee syllabary (*2*), the low incidence of reading failure in Japan, and the historically frequent invention of syllabaries are suggestive.

Finally, we must comment on Brooke's contention that meaning is an issue in initial acquisition of reading. There is no reason to suppose that we have to teach the child to speak, that we have to teach him what words or sentences "mean," as part of the process of teaching him to read. The children give every evidence of knowing how to speak English and knowing what they mean when they speak. If a child can render print into spoken language, we assume very confidently that he will be able to understand his own speech when he does so with only a minor proviso: the heavy concentration on articulation in early stages of reading may cause some initial garble. In short, the tangled question of meaning, interesting and mysterious as it is, has been solved with great efficiency by the 5-year-old before he is introduced to the problem of learning to read.

PAUL ROZIN
University of Pennsylvania, Philadelphia 19104
LILA GLEITMAN
Swarthmore College, Swarthmore, Pennsylvania 19081

References

1. L. Gleitman, P. Rozin, M. Allen, J. M. Barch, B. Bressman, J .Buchanan, in preparation.
2. I. J. Gelb, *A Study of Writing* (Univ. of Chicago Press, Chicago, 1963).

Kentucky Health Care

Some unfortunate examples of assertive reporting are included in Bazell's article on the Office of Economic Opportunity's health care program in Floyd County, Kentucky (News and Comment, 30 Apr., p. 458). Bazell reports that "Over half the county's population of 34,000 falls below the poverty line"; "The OEO went into the health business during the Johnson administration because of the realization that poverty and ill health reenforce each other"; and "The poor people are afraid for their jobs, their food stamps, or whatever means of income they have."

What is the "poverty line"? Obviously it is different in different areas and at different times. According to my data a cash income of $3000 per year per family is affluence in Kentucky Appalachia.

I suggest that OEO went into the health business for more complicated reasons than are asserted, that the same political forces were operating that led to military bases and defense plants in some locations. In 1967 Kentucky had a vigorous professional Department of Health that could have regulated the Floyd County health program. The Kentucky Department of Mental Health has promoted, advised, and is regulating comprehensive care centers in all of Kentucky, Floyd County included.

If the poor people were "afraid for their jobs, their food stamps, or whatever means of income they have," I failed to find it out in the 3 years (1967–70) that I traveled throughout eastern Kentucky for the Department of Mental Health. I found the people of Kentucky Appalachia more shy and reserved than afraid. The many enrol-

lees with whom I became acquainted in OEO's Work, Experience, and Training Program were friendly, most courteous, and grateful for the "pay" they got from their "jobs." The supervisors and administrators of the program were dedicated and competent. Many if not most of them were indigenous to Appalachia. They had been away to school and came back. They did not want to live or work elsewhere. I tried to recruit some of them without success. They were much related to each other and to the civic and political leaders. This was inevitable in view of their social and geographic isolation. I can't see how any extensive program in Kentucky Appalachia could operate without the relatives of its leaders. For the most part they are the only ones who are trained, who empathize with the people, and know how to deal with the complex interpersonal relationships in this isolated area. . . .

MILTON B. JENSEN
1405 Jacobson Circle,
Sun City Center, Florida 33570

My feelings regarding the OEO's Comprehensive Health Care Program in Floyd County were misrepresented in Bazell's article.

I tried to convey in my interview that all persons involved in the program everywhere should forget all pride and power and come together in unity to formulate a good health care program.

I did not intend to place blame on any one individual or group of individuals for the present status of the program.

RUTH JAMES
318 Central Avenue,
Prestonsburg, Kentucky 41653

Santa Cruz: A Misunderstanding

In commenting on Carter's article (15 Jan. p. 153) about the University of California at Santa Cruz, W. F. Eberz (26 Mar., p. 1200) shows such misunderstanding that some correction —even one as informal as mine—seems useful in these columns.

1) UCSC does not select "those with the highest grades." As a campus of the University of California system, UCSC is bound to admission criteria adopted by the whole system. To select among the applicants to this particular campus, grades are used only as part of a much broader array of criteria. Selecting applicants would be immensely more informed if pass-fail, with written evaluations of students' work, were adopted in secondary schools and so available to us. If we now use grades to judge applicants' strictly academic schoolwork, it is because grades are all that most schools currently present.

2) UCSC does not "deny . . . distinction to those who accomplish the most" nor deny graduate schools or others the means of "selecting the most fitting applicants." Quite the contrary, we believe pass-fail, with written evaluations of a student's work, provides a far more comprehensible, just, complete, and explanatory "grade" than can a list of more familiar but simply opaque digits or ABCDF.

What the university has been trying to do since 1965 is to evaluate students' work and accomplishment, rather than merely to shell out coinage for courses "taken." The endeavor can be faulted on some counts—demands on faculty time, initial uncertainties as to how best to achieve the aims of the task, difficulties in evaluating students' work in large classes—but we are aware of these dilemmas and trying hard to resolve them. What pass-fail and UCSC's other efforts simply cannot be criticized for though is any such hypocrisy as Eberz's letter implies.

TODD NEWBERRY
719 High Street, Santa Cruz, California

Calvert Cliffs Project

One of the crosses borne by a paleontologist is that of being called an archeologist. It happens all the time in the newspapers and we get pretty used to it, but it's a blow when it happens in *Science* (21 May, p. 826). This is not the only inaccuracy in Holden's article. The Baltimore Gas and Electric Company did not postpone construction to allow scientific excavation of the power-plant site. The company did, however, give excavation privileges at the site to the Maryland Academy of Sciences, which organized the Calvert Cliffs Paleontology Project with grant support from the National Science Foundation, Ford Foundation, the State of Maryland, National Geographic Society, Blaustein Foundation, and several corporate members of the Maryland Academy.

The project is mainly paleoecologic in nature, and is being carried out by