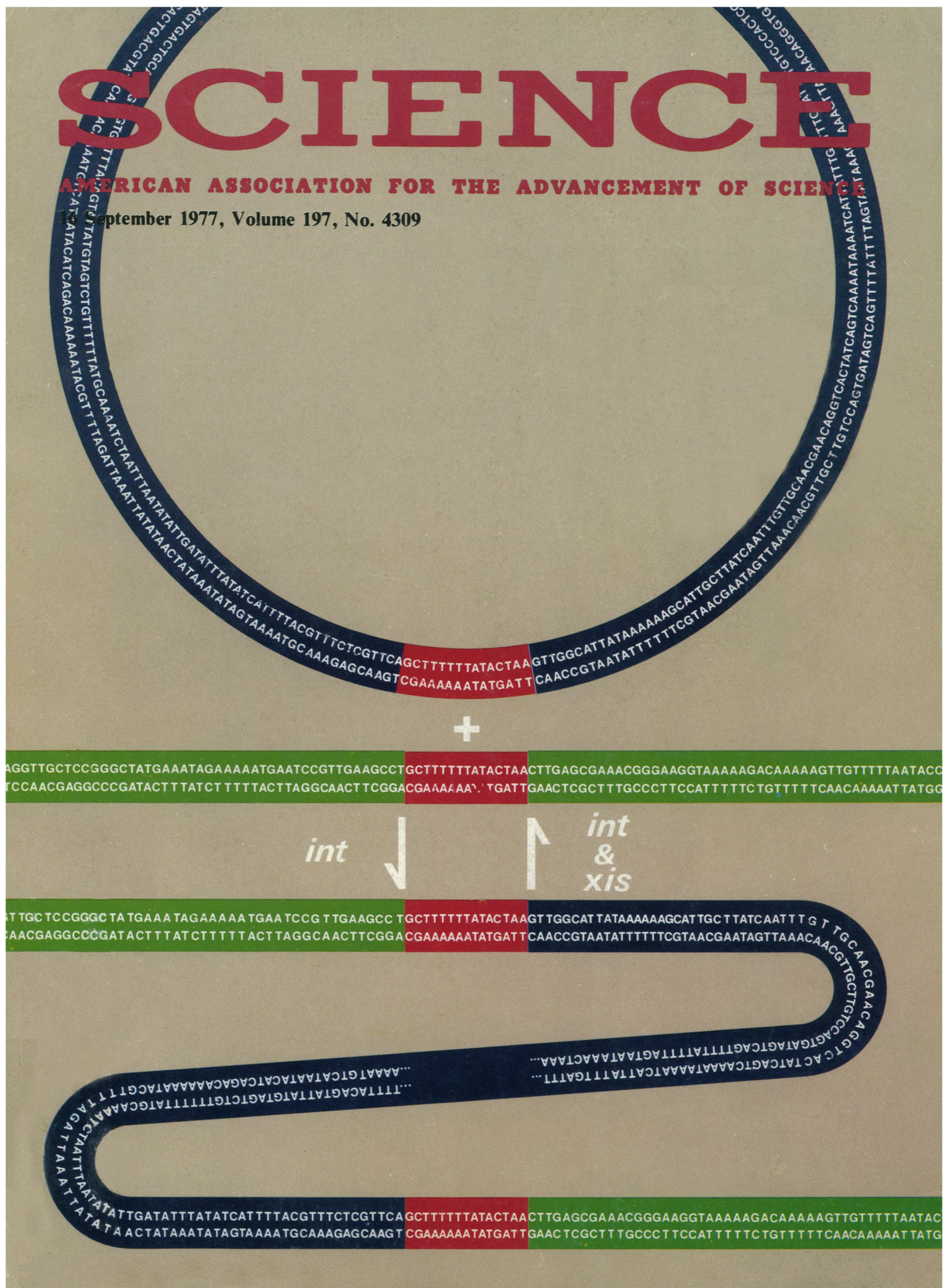


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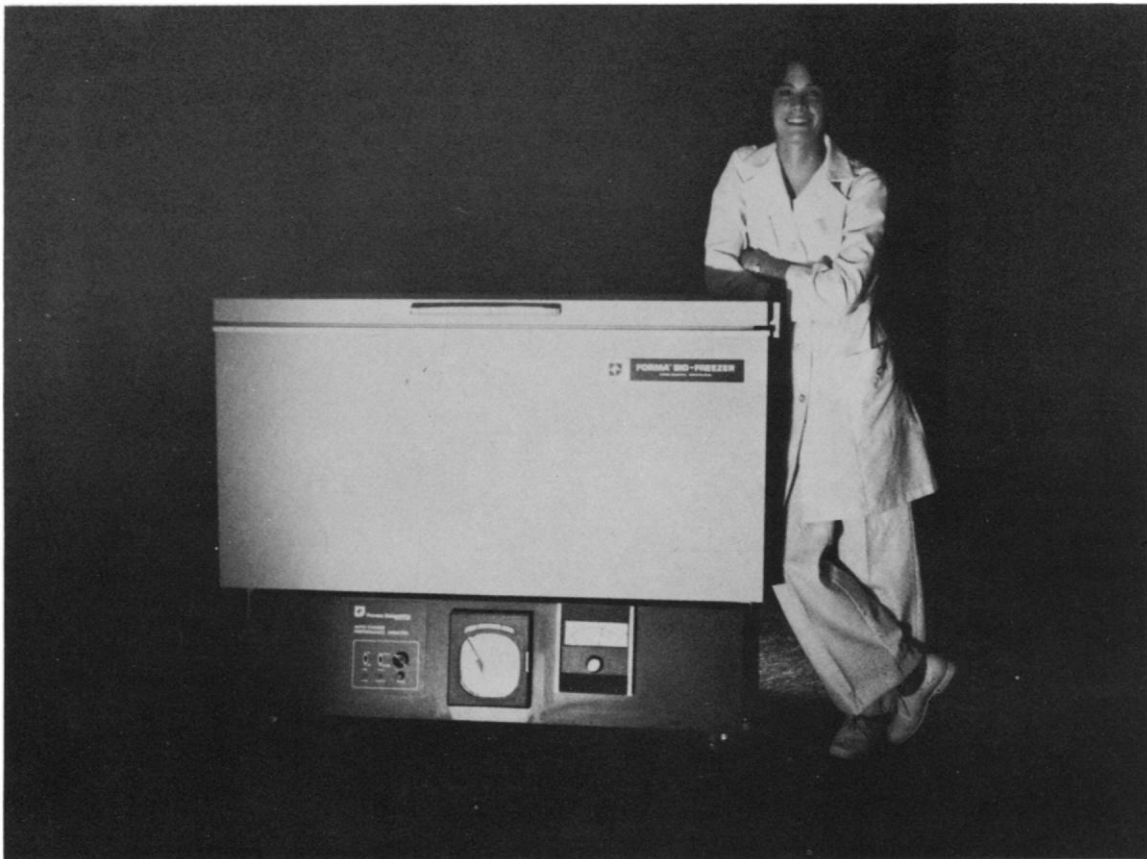
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16 September 1977, Volume 197, No. 4309





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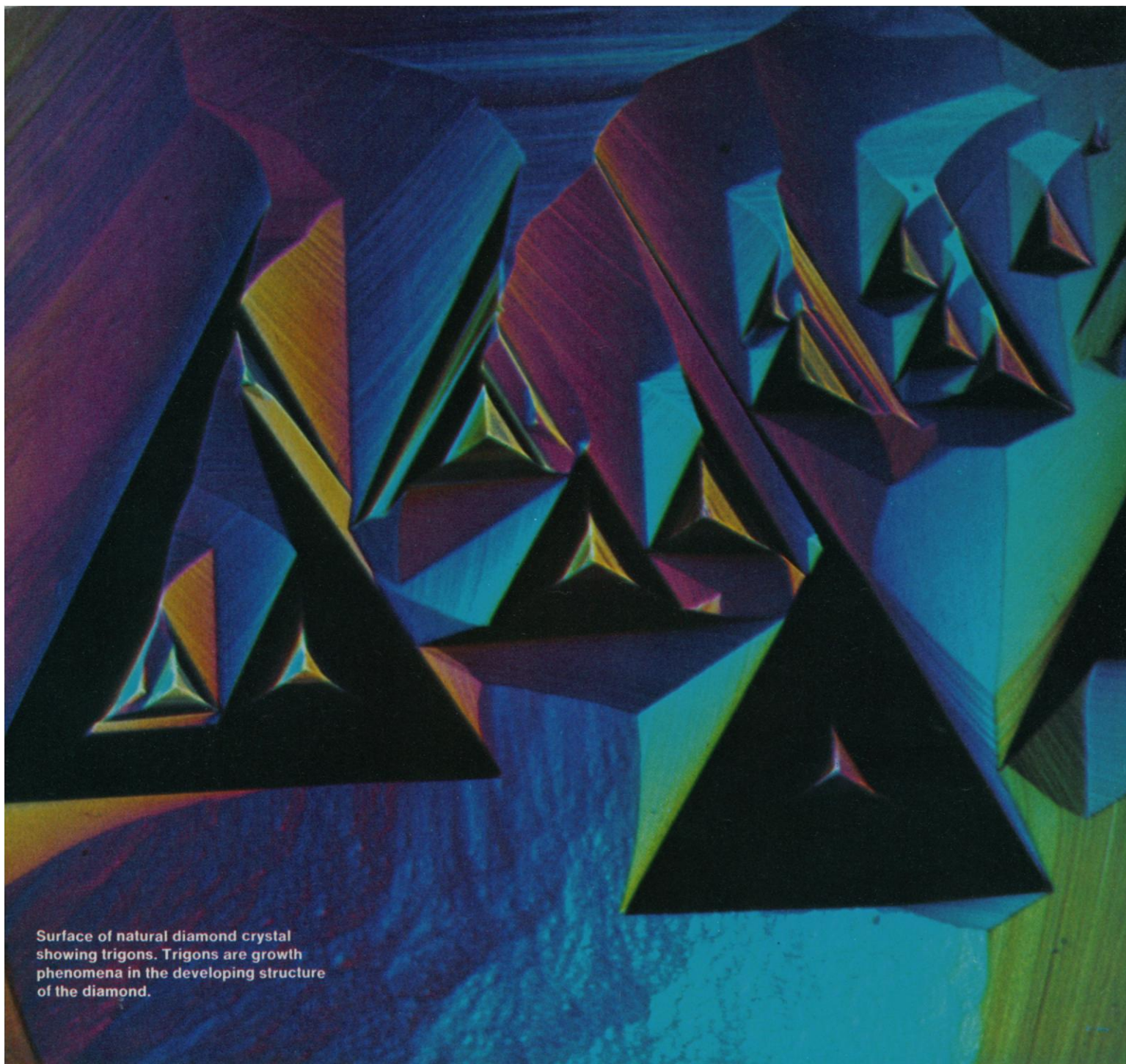
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Surface of natural diamond crystal showing trigons. Trigons are growth phenomena in the developing structure of the diamond.

Photomicrograph by Julius Weber

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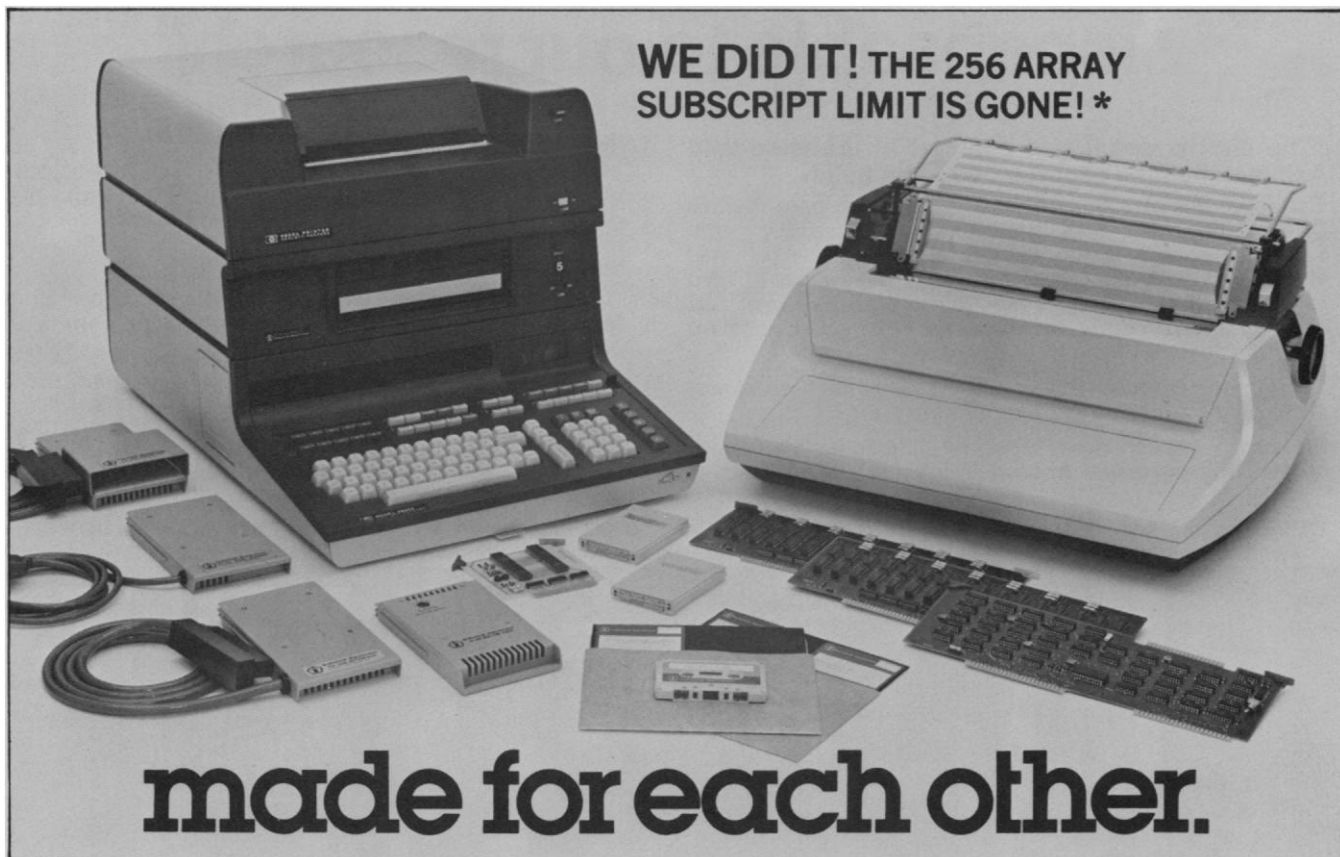
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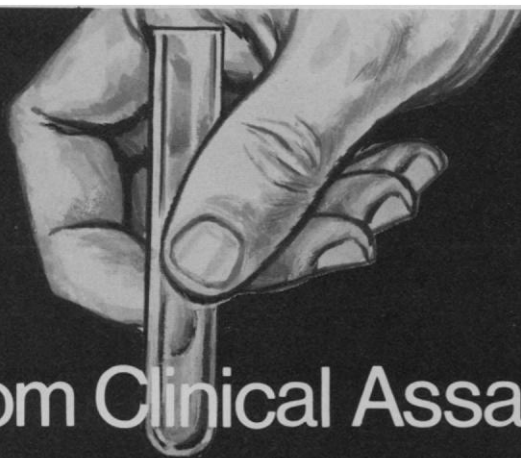
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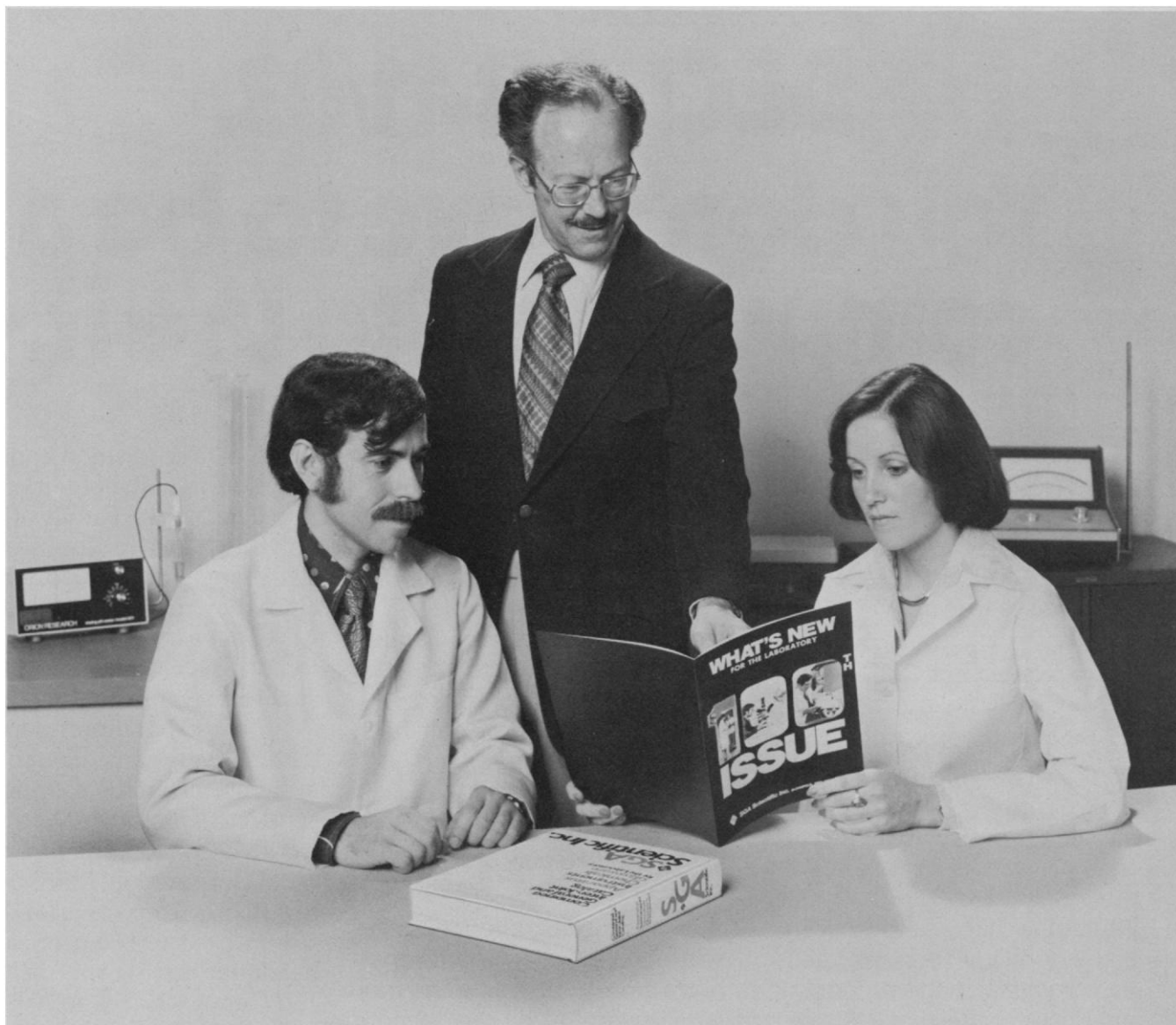
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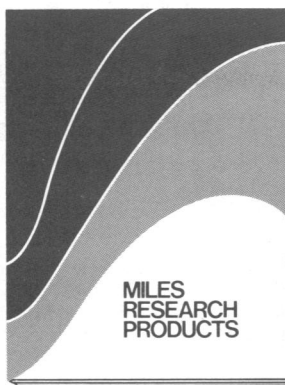


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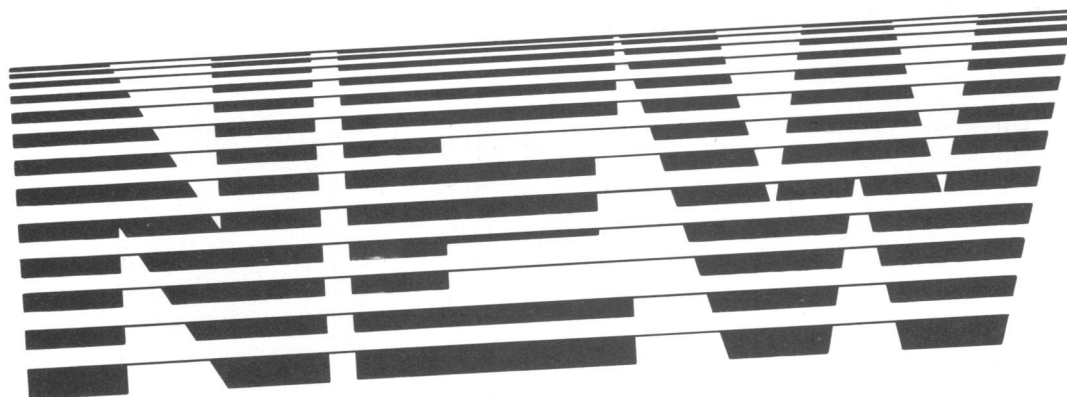
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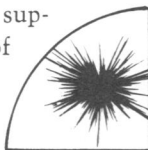
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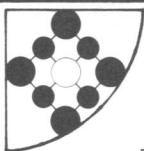
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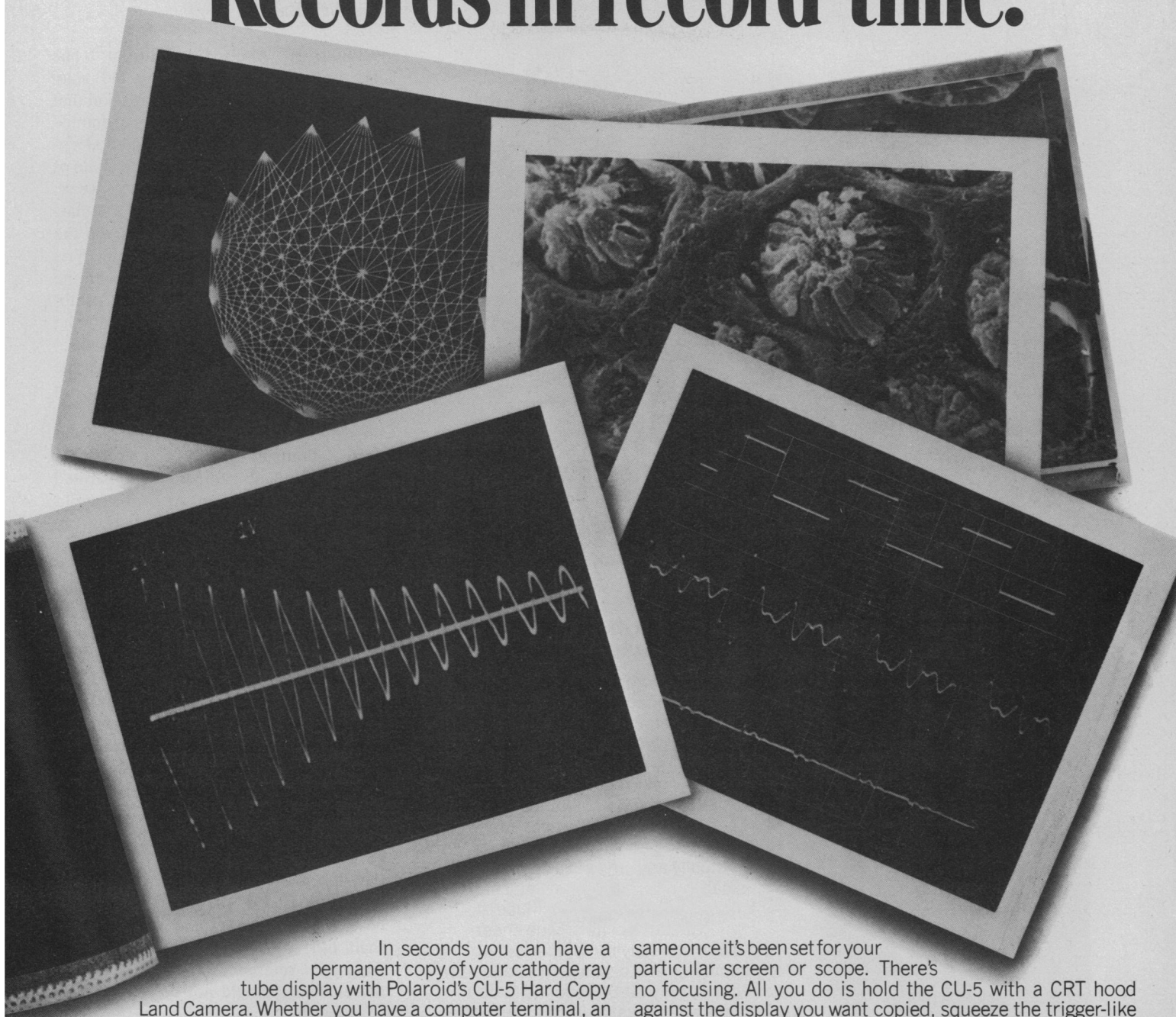
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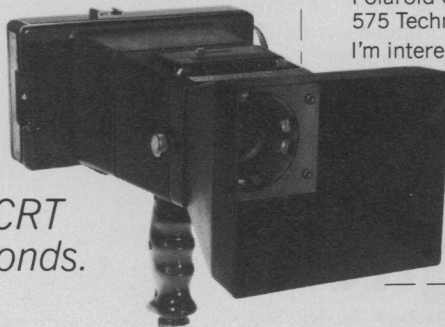
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## LETTERS

### The Tris Ban

Philip H. Abelson's editorial "The Tris controversy" (8 July, p. 113) may leave the reader with the impression that the Consumer Product Safety Commission's (CPSC) ban on Tris-treated sleepwear was taken in haste, that the chain of evidence leading to the ban was weak, and that the case against Tris, particularly in the legal arena, is tenuous. To the contrary, the evidence establishing Tris as a potent carcinogen, together with the legal precedents that have been established in similar cases, should sustain the ban of Tris-treated children's sleepwear.

Although Abelson suggests that the National Cancer Institute (NCI) tests on Tris were weak, the NCI Clearinghouse on Environmental Carcinogens (a committee of outside experts) concluded that the tests unambiguously demonstrated Tris to be a carcinogen. As for the applicability of these tests to predicting human carcinogenicity, at least three federal regulatory agencies (the Environmental Protection Agency, the Occupational Safety and Health Administration, and the Food and Drug Administration) and NCI have espoused the position that animal tests provide the best currently available evidence about the potential of chemicals to cause cancer in humans (1). In addition, the courts have increasingly agreed that "[a]lthough extrapolation of data from mice to men may be quantitatively imprecise, it is sufficient to establish a 'substantial likelihood' that harm will result" (2). Moreover, "where the harm envisaged is cancer, courts have recognized the need for action based upon lower standards of proof than otherwise applicable" (3). Thus, Abelson's references to weaknesses in the evidence should not be read to suggest that the courts will require more of a showing by CPSC to justify the ban on Tris. Instead of requiring what have been characterized by the courts as "impossible proofs" (4), it becomes ever more apparent that in the area of protecting the public against exposures to carcinogens, "the statutes—and common sense—demand regulatory action to prevent harm, even if the regulator is less than certain that harm is otherwise inevitable" (5).

The NCI carcinogenicity evidence, the capability of Tris to produce heritable mutations in eukaryotic cells (6), the demonstrated ability of Tris to be absorbed from treated fabric through human skin (7), and the observation that Tris applied to the skin of rabbits caused

aspermogenesis should be ample evidence of the possible tragedy which may result from having used Tris as a flame retardant in children's sleepwear. If anyone can be criticized for the Tris imbroglio, it is Congress for not requiring that flame-retardant chemicals be demonstrated to be safe, and the industry for not testing Tris before exposing more than 60 million children to it.

ROBERT H. HARRIS

Toxic Chemicals Program,  
Environmental Defense Fund,  
Washington, D.C. 20036

#### References and Notes

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#### Lovins on "Lovins' Fever"

In response to Robert Nathans' three points supporting his diagnosis of "Lovins' fever" (Letters, 12 Aug., p. 618) in the excellent article by Allen L. Hammond and William D. Metz (Research News, 15 July, p. 241):

1) It is hard to make a persuasive case that appropriate design and capital-transfer schemes cannot make dispersed solar systems as attractive in cities and for poor people as in suburbs and for rich people. Higher load density may even improve the economics (1). It is also difficult to reconcile the uncited "examination" of decentralized solar systems Nathans mentions with the tenor of the Office of Technology Assessment's new study on solar energy (2).

2) Since detailed assessment of end-use-matched solar technologies has barely begun, Nathans can speculate uncon-

strainedly about their possible effects. Those he suggests, however, need not arise. The systems I have discussed, for example, need no utility backup, displace utility capacity only at the margin, and do not encourage commercial or industrial dispersion. Further, disruption in case of breakdowns would be less than for a centralized system (3).

3) I envisage continued reliance on existing, therefore largely centralized, energy facilities until they are mostly replaced—through normal attrition over the next 50 years or so—by soft technologies where these are most convenient to start with and by transitional fossil-fuel technologies elsewhere. All degrees of centralization would coexist, and their proportions would change, during the transition. In the end, the scale spectrum would match that of end-use, virtually eliminating the costs and losses of distribution. The hybrid system Nathans urges is thus consistent with my thesis—so long as he is not proposing to build additional centralized systems, which would be unnecessary and uneconomic.

AMORY B. LOVINS

11 Village Close, Belsize Lane,  
London NW3, 5AH, England

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3. A. B. Lovins, *New York Times*, 24 July 1977, sec. 4, p. 17.

#### Nutrition and IQ

Winick, Meyer, and Harris (19 Dec. 1975, p. 1173) have reported an interesting set of data relating the IQ's and school achievement scores of adopted Korean children in American homes to degree of early nutrition as indexed by height and weight before age 2. The purpose of this note is to question the authors' interpretations of their findings.

The authors state that their objective is to investigate whether "enriching the environment of previously malnourished children might result in improved development. To test this hypothesis, we have examined the current status of a group of Korean orphans who were adopted during early life by U.S. parents and who had therefore undergone a total change in environment." In order to test this hypothesis it is necessary to have not only a group which receives "enrichment" but also a control group that does not.

C&EN May 3, 1976

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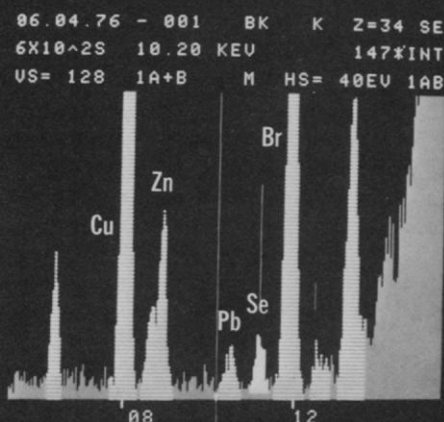
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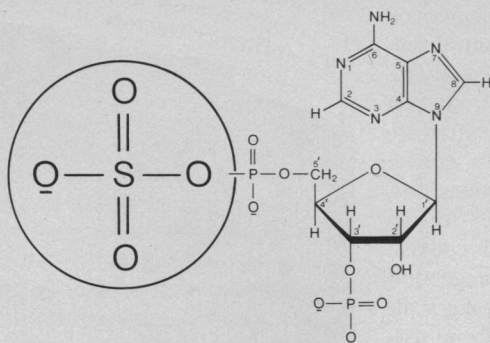
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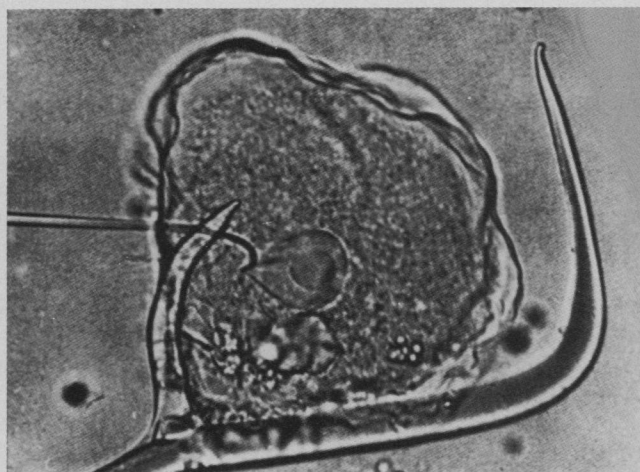


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There was no such control group in the study and therefore no conclusions can be drawn from it about these authors' enrichment hypothesis.

A second problem concerns their defining as "malnourished" all the children in their study who were below the 3rd percentile of a "Korean reference standard" for both height and weight when admitted to the adoption agency. There may be various reasons not related to nutrition differences why some children are the smallest. For example, different Korean populations, with differing norm values for height and weight, may have been disproportionately represented in the sample of adopted children. Such considerations raise the reasonable possibility that one or more variables associated with low weight and height, exclusive of malnutrition, are also associated with IQ, and might account for some of the difference found between the IQ's of the smallest (mean IQ, 102) and the largest (mean IQ, 112) children. It should be noted that, since the IQ of the smallest group is equal to the American average, there is no evidence of long-term deleterious effects of malnourishment upon intellectual performance.

One thing we can reasonably infer from the article is that these children were well fed after they were adopted, and that at least some of them had been poorly fed before being taken in by the adoption agency. Therefore, a reasonable conclusion from these findings is that in a group of children in whom nutritional rehabilitation occurred prior to 3 years of age there is no evidence of subsequent intellectual impairment as measured several years later by IQ or school achievement tests. These data can be viewed as an empirical extension of the Dutch findings that malnutrition during pregnancy had no measurable effect upon later intellectual capabilities (1).

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#### References

1. Z. Stein, M. Susser, G. Saenger, F. Marolla, *Science* 178, 708 (1972).

We are in complete agreement with Denenberg that the experimental design of our study was not perfect. Fortunately the kind of "control group" he seeks was not available. We cannot agree that our data are an "empirical extension of the Dutch findings," which were related to prenatal rather than postnatal malnutrition. The average drop in birth weight in the Dutch study was about 10 percent (9.6 percent) whereas the children we ex-

amined were by definition more than 40 percent below ideal weight. We cannot be certain from our data that the children with a mean IQ of 102 have reached their maximum potential, since the two other groups had higher IQ's. The use of height and weight data recorded at the time of admission to the adoption agency to establish nutritional status is standard practice, and all of the children in the malnourished group met the international classifications for being severely malnourished (1, 2). Many studies have documented what happens to such children if they are returned to their original environment. Their IQ's and achievement scores are much lower (2, 3). Finally, Denenberg states that "nutritional rehabilitation . . . prior to 3 years of age" is followed by "no evidence of intellectual impairment. . . ." Certainly adoption of Korean youngsters into middle-class U.S. families implies more than just adequate food. We don't know which other factors are important. We can only say that the new environment has in some way made the difference.

MYRON WINICK

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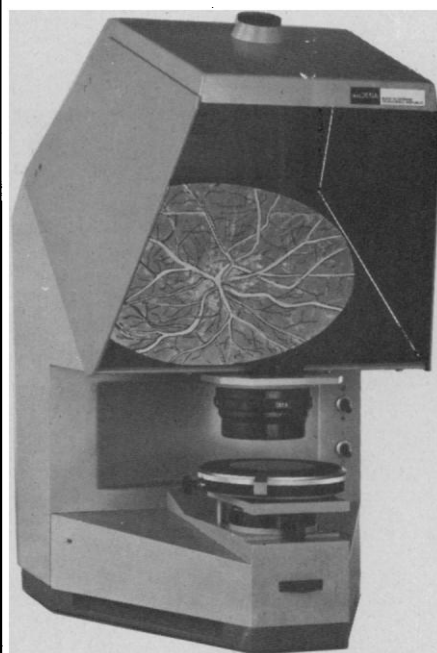
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#### Discovery of the Monitor

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## Coercion of Medical Schools

When federal support for academic research and education was proposed, there were many misgivings about eventual government intervention. This was slow in coming, but lately it has been highly manifest. As a result, Washington has become to many an object of fear and antipathy. This is especially true of the deans of medical schools. Interference has reached such proportions that some institutions are now willing to forgo federal funds.

The medical schools have crucial roles in research, teaching, and health care. They are leaders in applying biomedical research. They teach the latest and best material to the students. Patient care at their hospitals sets standards for excellence. Among medical practitioners, those associated with medical schools have been tops in their fields. The medical schools have been responsive to societal desires. In an ideal world such citadels of virtue would be trouble-free. But this is not an ideal world. Too often, excellence is a magnet for trouble. In the case of medical schools, most of their problems have come from trying to do too much for society. Resultant financial strains have made them vulnerable.

Research activities are a drain, not a bonanza. Tuition covers a small fraction of the cost of medical education. General practitioners and others refer their costly or botched-up cases to the medical schools.

A major source of deficits has been in the educational activities. A decade ago there was much talk about a shortage of doctors. The medical schools responded positively and set about increasing their enrollments. This involved capital expenditures only in part made good by the government. It also entailed expanded faculties. In response to societal wishes, the schools held down tuition fees so that worthy but less affluent students might be served. While costs per student were in the range \$10,000 to \$20,000 per year, the median tuition was about \$4000. Thus, federal subsidies for tuition (capitation) were eagerly sought and accepted. At first these were fairly liberal, but in the academic year 1976-1977 they amounted to only \$1000 per student.

Congress has chosen to use this pittance as leverage in an attempt to control admissions policies at medical schools. Under current legislation, each school must admit an increased number of third-year students (10 percent of the class or ten, whichever is greater) to obtain a capitation of \$2000. The increased capitation does not cover the increased expense. The bulk of transferees would come from foreign medical schools, where standards of admission and training are generally inferior. Most of these students are U.S. citizens who were initially rejected by our medical schools. However, many are offspring of wealthy parents who could afford to send their children abroad for training in the expectation of later returning to practice in the United States. The medical schools should reject the new strings on capitation as a matter of principle as well as on financial and egalitarian grounds.

There is a broader, important issue. That is the long-term costs of increasing further what is now regarded as an excessive number of doctors. Given a large body of hypochondriacs and lonely people, and given third-party payments, there is practically an infinite demand for medical attention. Eli Ginzberg\* has cited estimates of the total expenditure society makes in supporting a physician for a year (\$250,000). Thus, during one professional career, society will, on average, spend about 8 million current dollars. For each year that the present capitation legislation is implemented, the cost to society for the rejectees will be in excess of \$10 billion.

It is to be hoped that the medical schools will be steadfast in their refusal to accept further government coercion.—PHILIP H. ABELSON

\*E. Ginzberg, *New England Journal of Medicine*, 7 April 1977, page 814.



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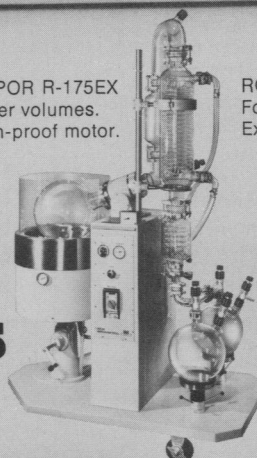
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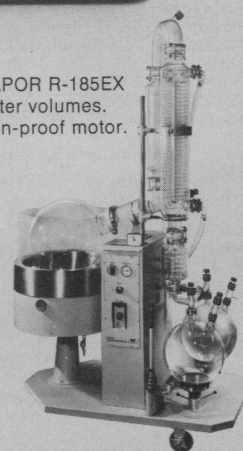
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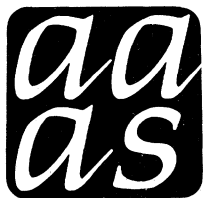


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sessions will be of two types: *slide sessions* and *poster sessions*. In the slide sessions each contributor will have 15 minutes to present his material and entertain questions; a 35-mm (2 × 2) slide projector will be available for use. In the poster sessions each contributor will have a bulletin board on which to place text and graphic material (of an oversized nature) for an extended period of time so that he can discuss his work at length with all interested parties. (See *Science*, 28 June 1974, page 1361).—ARTHUR HERSCHMAN

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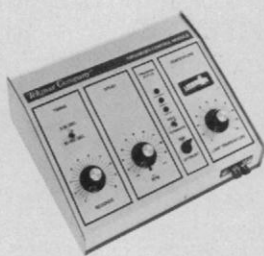
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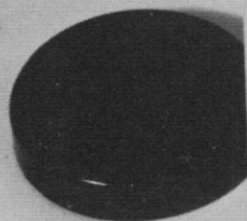
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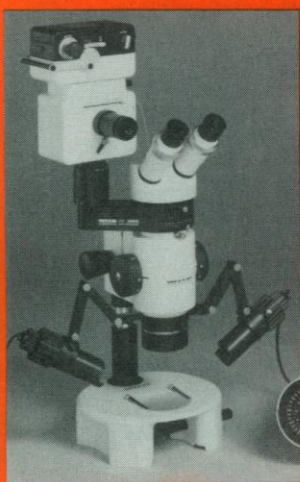
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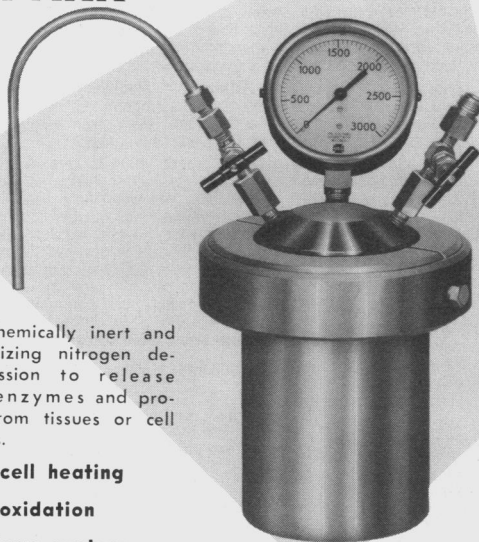
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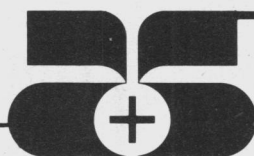
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