SCIENCE

17 January 1975

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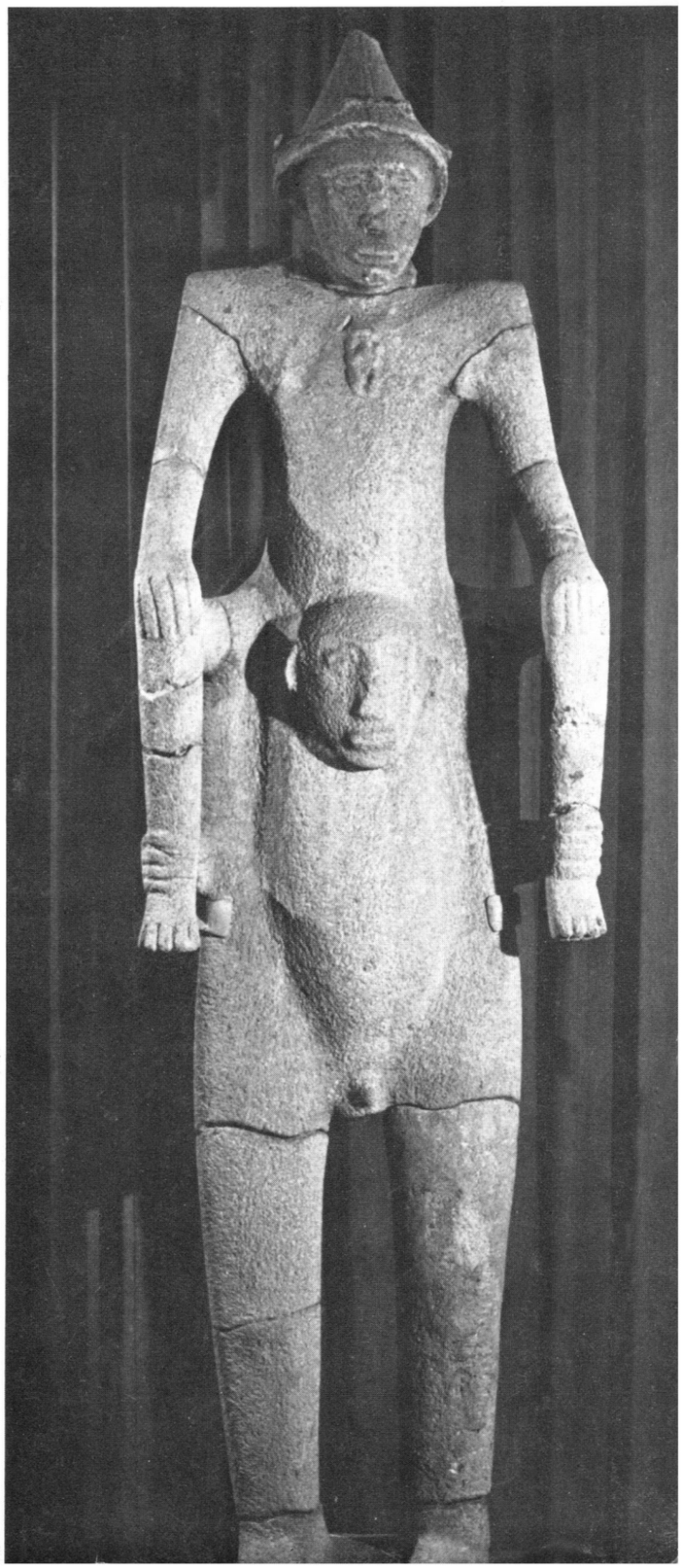

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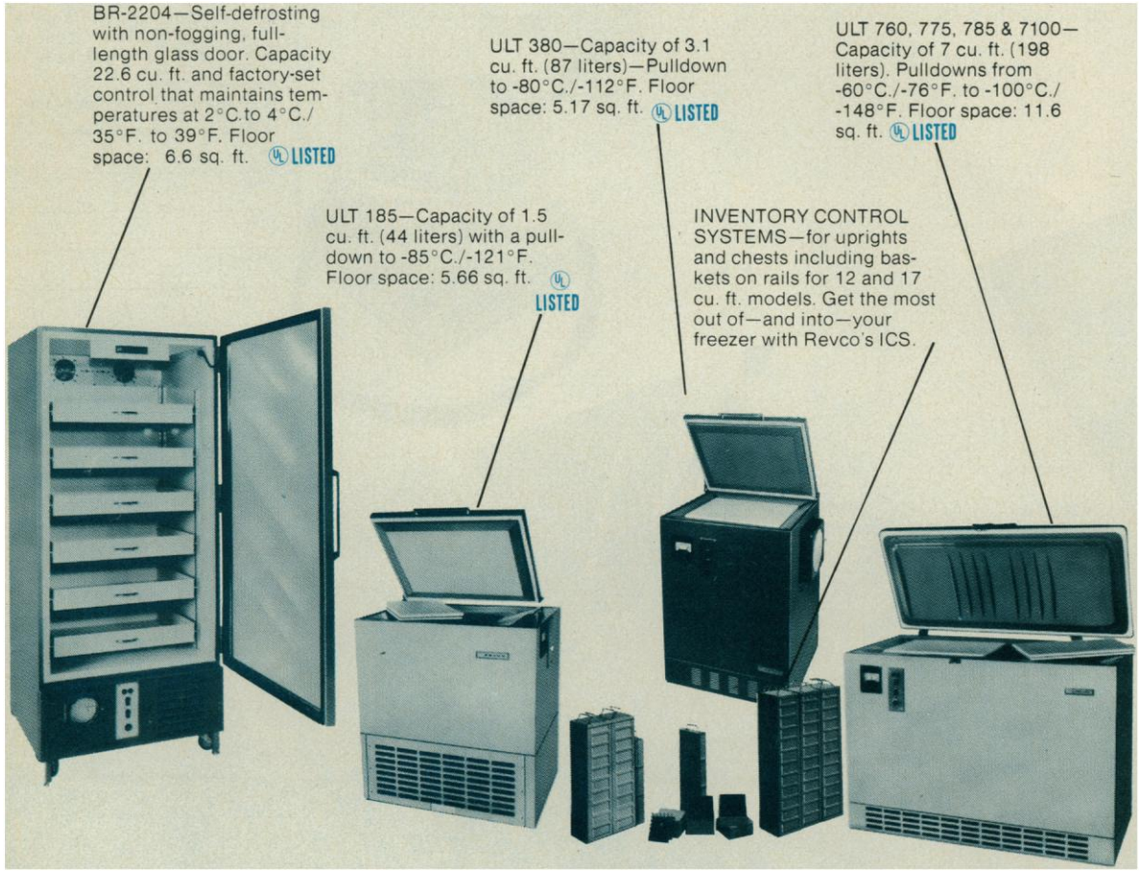

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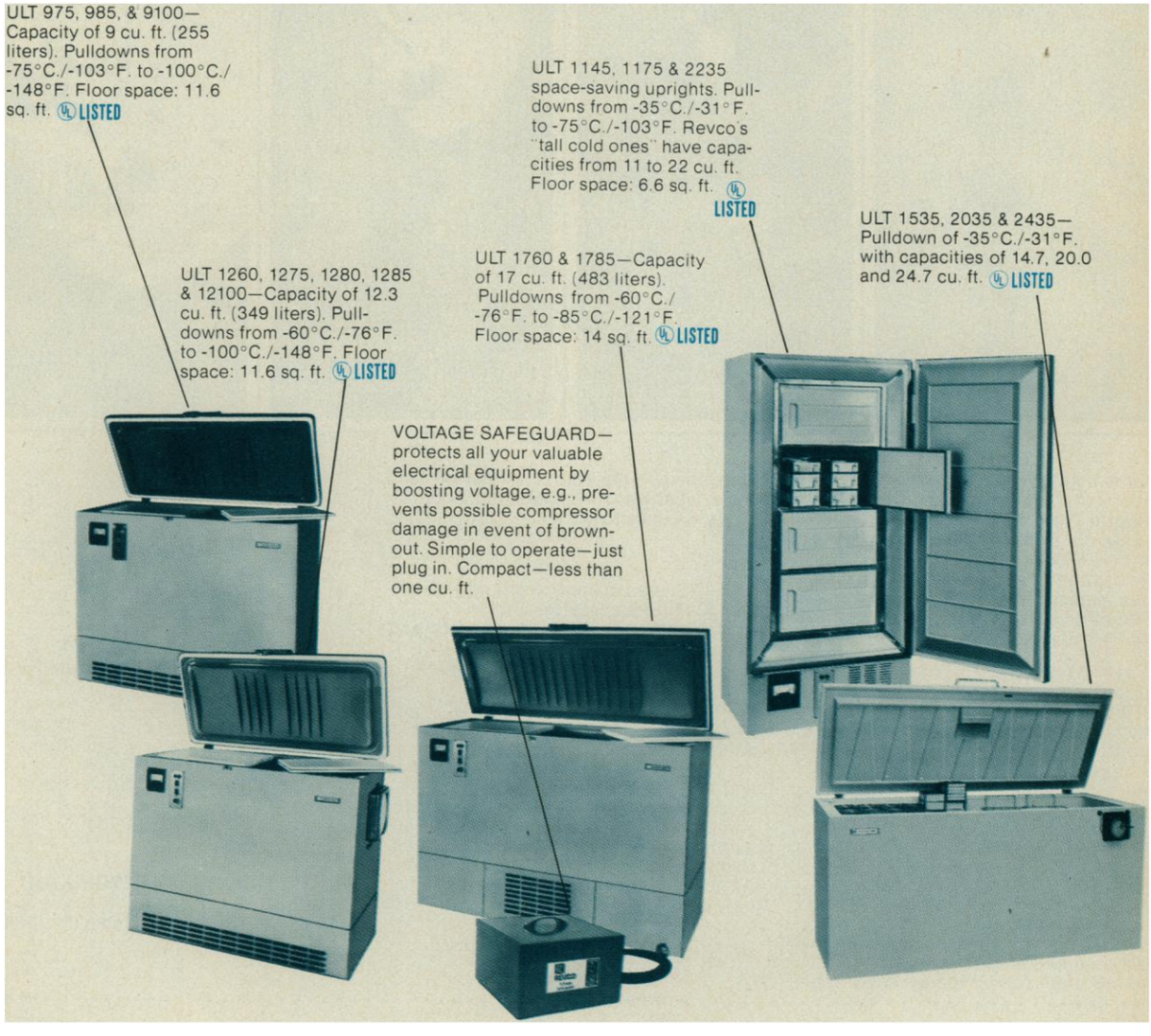

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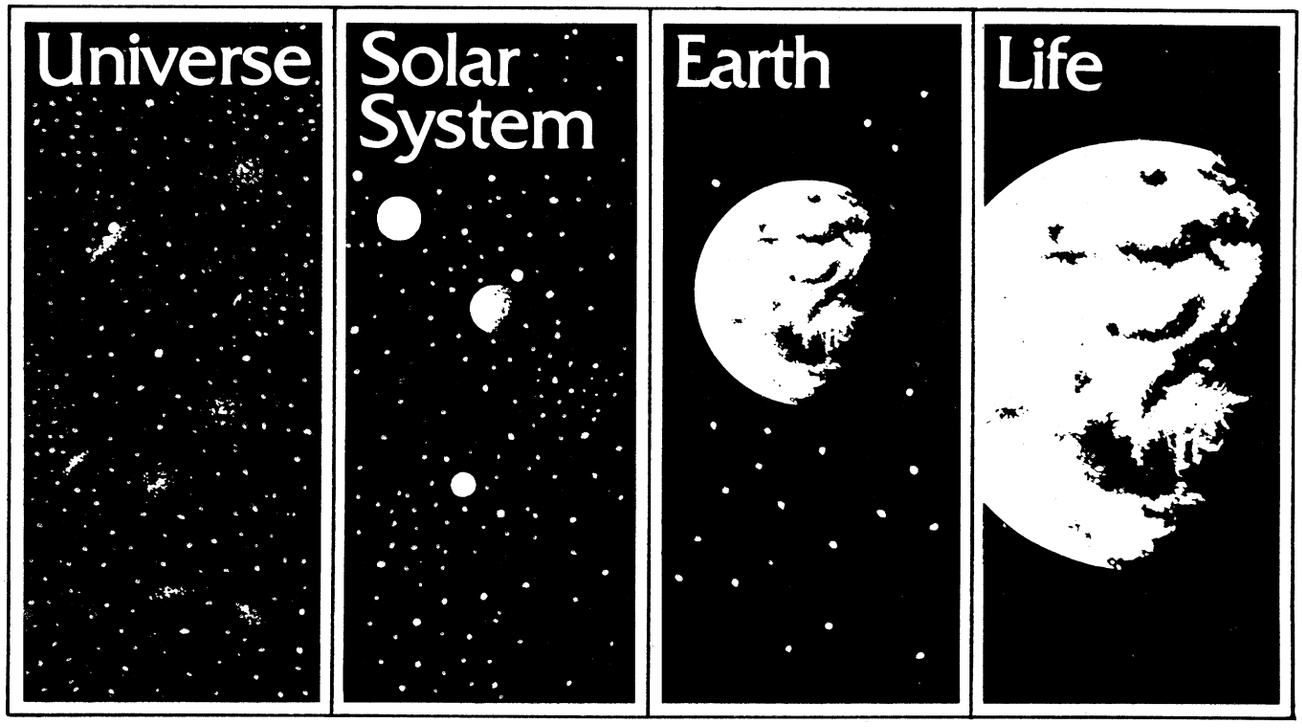
Origins:

Speculations and facts on the sources of planets, Earth, and life by Robert Jastrow, Philip Morrison, Cyril Ponnamperuma, George Wald.



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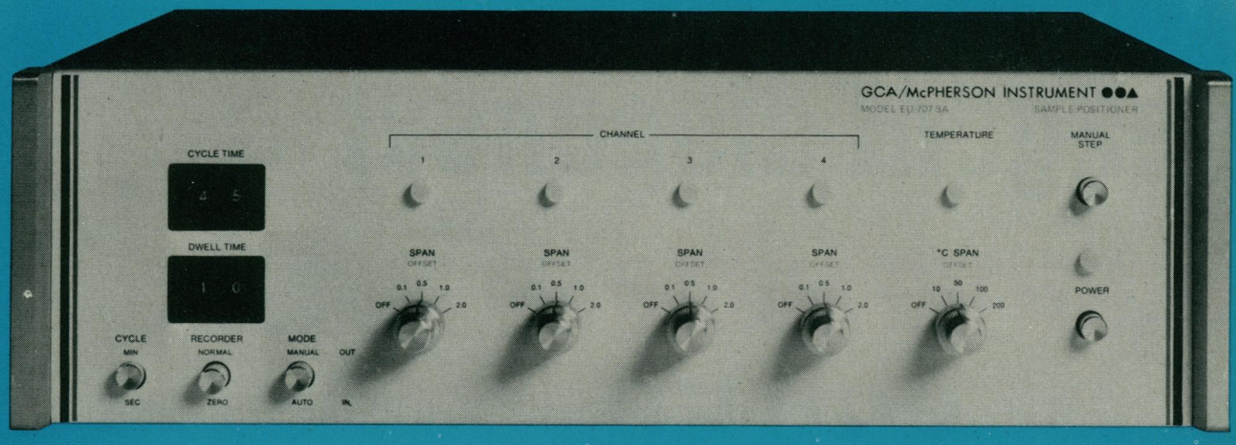

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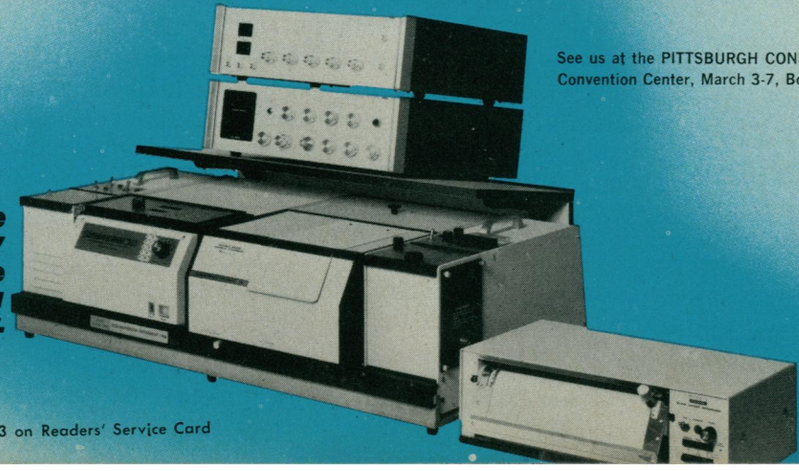

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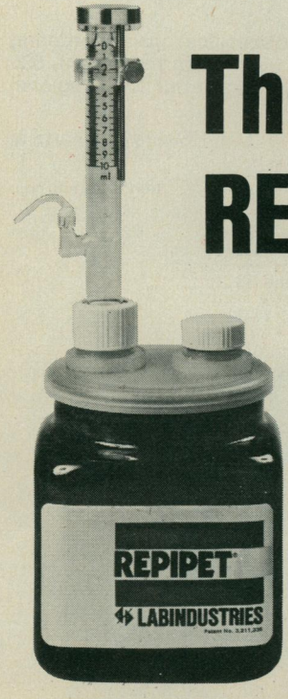

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Lottery Admissions System in the Netherlands

The editorial "Medical school admissions matching" (2 Aug. 1974, p. 401) and the subsequent letters (11 Oct. 1974, p. 93) have called our attention to the fact that the problem we currently face in the Netherlands is far from unique.

Originally in this country, every student who passed state-controlled high school examinations could enter the academic field of his choice, provided the subjects of his examinations were suitable for that particular field. In recent years, in at least ten fields of study, the number of applicants has greatly exceeded the capacity of the universities to train and accommodate these students adequately. Finally, 3 years ago, a quota system was established for certain fields of study, one of which was medicine.

At present, there are approximately three applicants for each available place, so a selection system was set up to keep the number of students admitted within the allowable quota. Committees were appointed and selection procedures in other countries were carefully studied. The system we ended up with allows entrance to a few students with very high examination scores; for the remaining students, entrance is decided by lottery. This approach, although highly unsatisfactory, at least enables gifted students to study in the field of their choice.

This system has now been in operation for 2 years, and we expected that during this time a quantitative admissions procedure would be developed. However, instead of a selective admissions system, the Dutch government now proposes to limit student admissions by lottery only. This will prevent a number of highly intelligent students from being admitted to the profession of their choice.

We think it is immoral to have a system in which the future of human beings is decided by a game of chance, and we feel that to use a lottery as a means of limiting the number of students admitted to universities is a direct threat to science in general.

FRITS L. MEIJLER
Department of Cardiology, University Hospital, State University of Utrecht, Utrecht, Netherlands

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Computer Use

In their article "Computer use under a free-access policy" (31 May 1974, p. 957), Luehrmann and Nevison make a case for free access to computing at a university, claiming that it is different from other schemes for allocating resources and that it results in greater educational value. In doing so, it appears that they make some faulty assumptions and draw some misleading conclusions.

First, the authors claim that, at most universities, users must pay for the services they consume. In this, they confuse accounting practice with allocation procedures. At Dartmouth College, faculty and staff bills are sent to users; and so they are at most institutions. Dartmouth student bills are sent to the Dean of Student Affairs; at most universities they are sent to the faculty responsible for the work the students are doing. Accounts are kept and bills are sent in both cases; neither case is analogous to the library procedure, as the authors suggest. The confusion is due to the fact that at most institutions, allocations are made to students in units called "dollars." What they are given in fact are not dollars but shares of the resources of the facility (*1*). If the input to the computer facility is $1 million, then the output is assumed to be computing services worth $1 million; a one-millionth "share" of this output is called a "dollar."

It can be argued that the share system is in fact a more flexible method of allocation and control than the methods in use at Dartmouth, where strict limits are placed on which parts of the system are accessible to the user. In the share system, the user can decide whether he wants to spend his shares on disk storage, tape input-output, CPU (central process unit) cycles, or interactive connect time. It is easier to make the resources match the job, and it is easier for facility management to mold user behavior to minimize conflict.

Second, the authors assert that the free-access policy accounts for the large number of users at Dartmouth. This would be hard to prove. The Dartmouth Time-Sharing System is well designed, user oriented, and includes interesting, exciting, and well-documented software. It is supported by a faculty and administration that makes the importance of computing evident to everyone on the campus.

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People at Dartmouth like the system and the system likes the people. This has as much to do with its wide use as the mechanics of distribution. In a system without this user orientation and on a campus without this ambience, students and faculty are restrained by the quality of service more than by the allocation procedures.

Finally, the authors conclude that free access to computing at other institutions will cause a dramatic increase in the number of users, but only a modest increase in demand. The implication appears to be that something of great value can be purchased at little cost. However, if the 30 to 50 percent of the students at a typical university who have no accounts were given free access to the computer, would they use it for any important educational purpose? If, as Luehrmann and Nevison suggest, their usage would be minimal, its value will probably be minimal as well. The difficult problem that the authors evade is the educational advantage that would accrue from a tenfold increase in number of users or even a 40 percent increase in demand.

One might even argue that there are some disadvantages to a free-access policy. The additional users would be inexperienced and naive; they would require a considerable increase in user services; and this cost would have to be borne by limiting the services now provided to the users to whom computing is more serious and important than it is to the casual user.

CHARLES MOSMANN

Computer Facility,
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References

1. C. Mosmann, *Academic Computers in Service* (Jossey-Bass, San Francisco, 1973).

Mosmann seems convinced that Dartmouth's friendly, user-oriented computer environment has been achieved through a substantial commitment of university resources. In fact, it is only a slight oversimplification to say that the reason why the computer system is easy for beginners to use is because Dartmouth has never had the resources that would be needed to train thousands of people to use a complicated system. Even today, contrary to Mosmann's expectation, the user services staff of six people at Dartmouth represents only 5 percent of the computer center budget. Furthermore, none of these is the typical, high-priced ap-

TRICHINELLOSIS

Edited by Charles W. Kim
State University of New York, Stony Brook

The sixty-three papers collected here comprise the scientific record of the Third International Conference on Trichinellosis, held in Miami Beach, November 2-4, 1972. The program consisted of symposia covering these aspects of trichinellosis morphology and **in vitro** studies, biochemistry and experimental pathology, immunobiology, clinical and diagnostic aspects, treatment, and epidemiology and control.

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plications programmer found at most university computer centers.

But this should not be surprising. Reflect for a moment on our favorite analog, the library. In which hypothetical university library environment would the cost of user services be greater—one in which all users could read and follow simple instructions, or one in which literacy was slight and users needing library service were compelled to work with the assistance of reading specialists? Granted, the latter arrangement would drive out the "casual user" of library service, but I fail to see a corresponding benefit to the "serious user." Computer illiteracy is also expensive.

On another issue, Mosmann evidently prefers a system of computer-dollar allocations to the free-access system described in our article. However, virtually all other educational and research resources are treated as cost centers that have little direct responsibility for "recharging" users for their services. The library example is worn thin, yet academic departments themselves are examples. Students do not have "chemistry dollars" to be collected at turnstiles in the lecture room. Instead, the student (or the state) pays tuition, and the university decides the quantity and quality of "chemistry service" that shall be available. While it thereby gives up the possibility of using differential pricing policies to manage demand for different courses, most people seem so convinced of the value of present practice that they would mount the barricades if an administration imposed such a free-market system on academic departments. Is computing so different?

Finally, it is difficult to deny the charge that free-access computing may lead to uses without any important educational purpose. So does free access to books, yet we don't object to a student's reading for pleasure. Setting aside the question of intrinsic value, we have evidence that the perceived value of computing at Dartmouth is very high indeed. In annual surveys of entering freshmen, we find that "availability of the computer" is among the top two or three most frequently stated reasons that the students selected Dartmouth. Our computer policy has thus contributed measurably to the fact that there are about ten applicants for every place in the Dartmouth freshman class.

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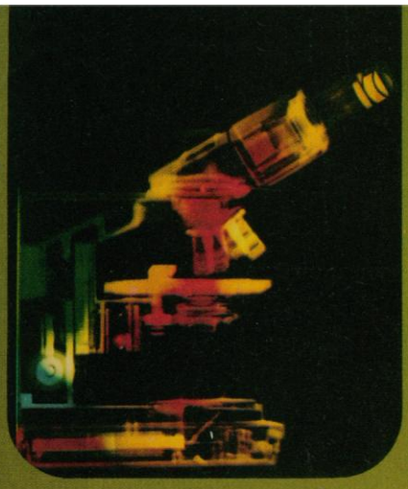

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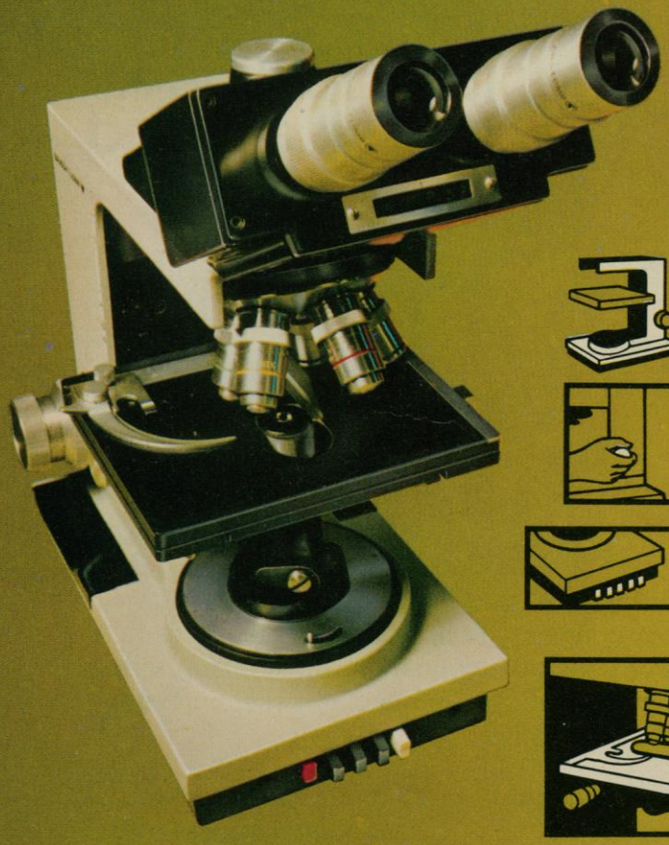

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Science Advice for the Executive Branch

President Ford has indicated that he will establish some kind of science advisory group in the Executive Branch. As yet the exact structure of the apparatus is uncertain, and scientists and engineers have made various proposals concerning it. Some of the suggestions have included establishment of a cabinet post, restoration of the earlier advisory system, creation of a council for science and technology, and formation of an office of research and engineering management.

In considering the advisory structure there are some general considerations that should be taken into account. For its part the scientific community should realize that the needs of the nation and the needs of the President take precedence over the needs of science. One of the major factors in the destruction of the earlier apparatus was that too many people, including scientists, perceived the President's science adviser as science's man in the White House. A second factor was the tendency of members of the President's Science Advisory Committee to criticize publicly the President's position in various matters.

For their part, too, the politicians need to have some sober thoughts. Many of the most pressing problems that this country faces and will encounter during the coming decades have substantial, crucial ingredients of science and technology. They are problems of a long-term nature that require planning and an understanding of technological limitations and opportunities.

But during the last decade, and especially the past 2 years, the decision-makers seem to have been chosen for their ignorance of technological matters. The country has been run by a combination of politicians, public relations types, management experts, and economists. Politicians are mainly drawn from the legal professions; they understand human nature and how to exploit public opinion. Public relations types are partial to the view that facts are not relevant; rather, what is important is what the public believes is true. Management experts consider that it is unnecessary to have deep knowledge about the matter they are deciding; they can get the facts from others. The record of economists during the past 2 years speaks for itself.

It would appear that the current level of decision-making might be improved if there were a slight infusion of some of the competences and values that many scientists and engineers share. We don't want to be the whole stew but we do suggest that a little sprinkling of the salt of facts and enduring values might be useful.

In establishing a new science apparatus, it would help if the planners considered thoughtfully the various functions that need to be filled and how they might be served. There should be an advocate or advocates of science, but they should be outside the White House. Presumably the function could be filled by the director and the board of the National Science Foundation. There should be a body, for example an office of research and engineering management (suggested by Edward E. David, Jr.), to evaluate and coordinate the research and development activities of government. This body should have a role in budgetary decisions. There should be a group responsible for long-term planning and capable of identifying the R&D efforts that should be sponsored now if needs a decade away are to be met. Finally, it would be desirable for the group of advisers surrounding the President to interact with one or more persons with broad scientific and technical backgrounds and administrative experience. In the past, the tendency has been to saddle one person with some or all of these functions. An attempt should be made to separate the functions and to bring into government some of the abundant talent that has lately gone unused.—PHILIP H. ABELSON

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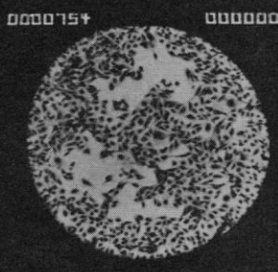

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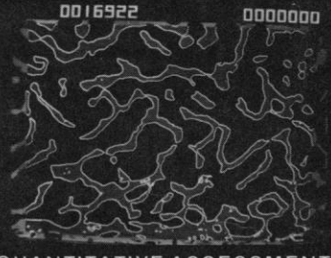

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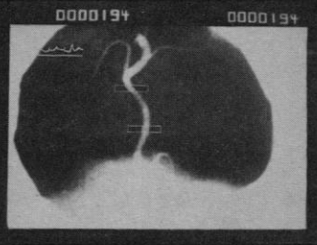

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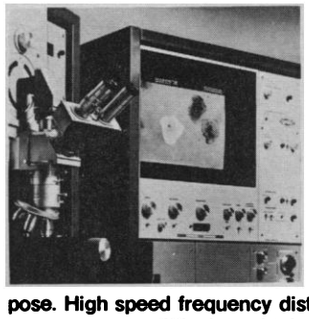

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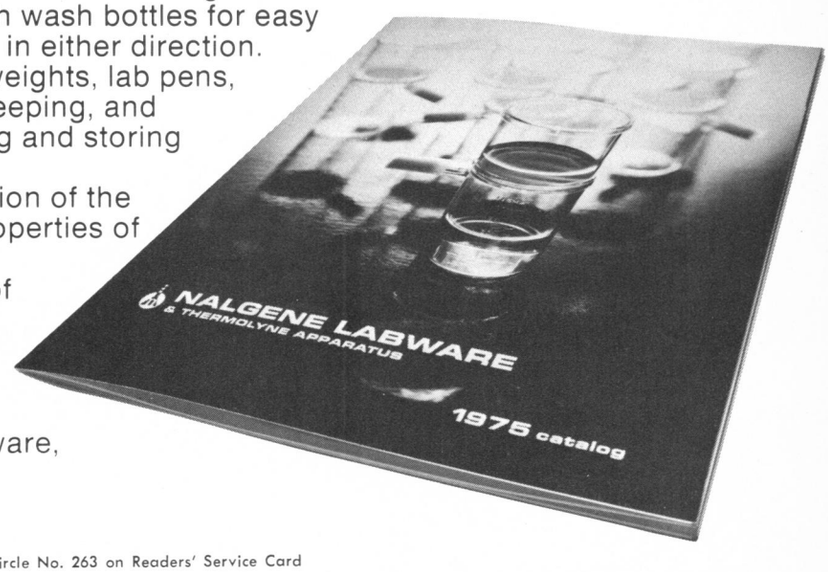

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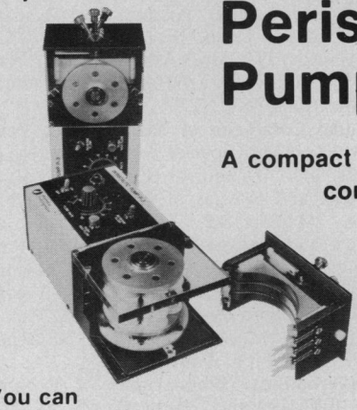

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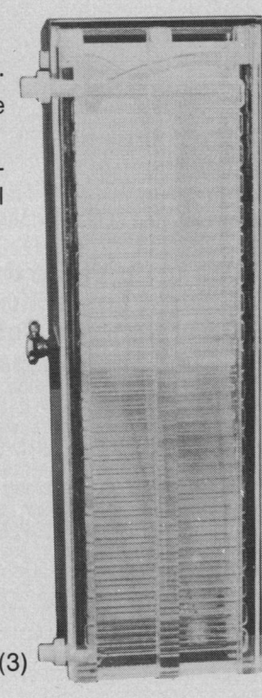

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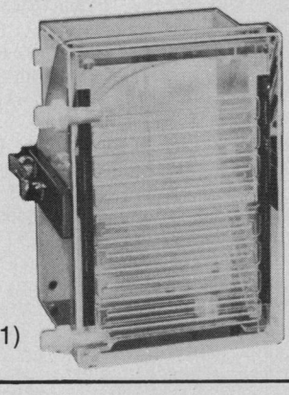

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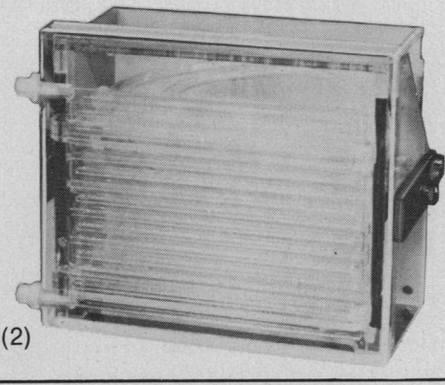

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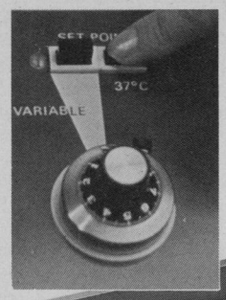

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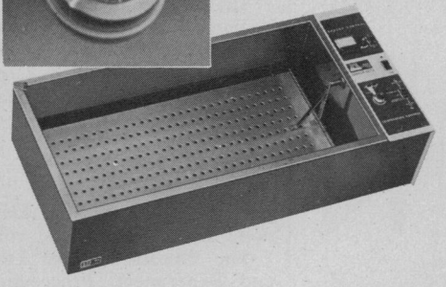

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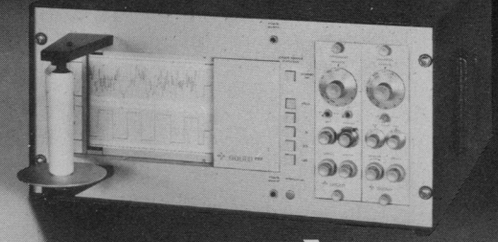

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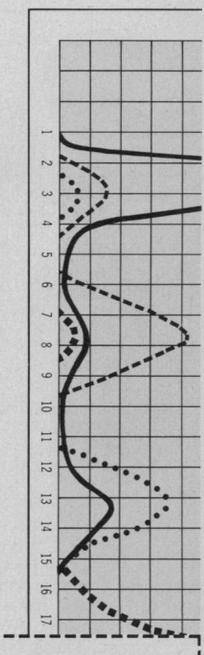

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