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SCIENCE

AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE

Book Issue

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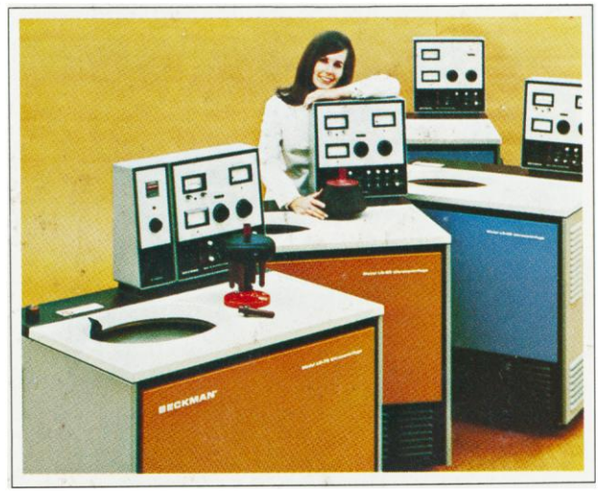

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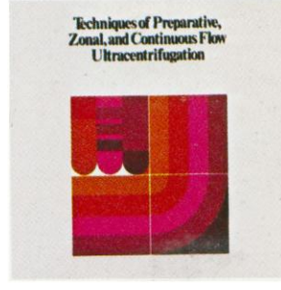

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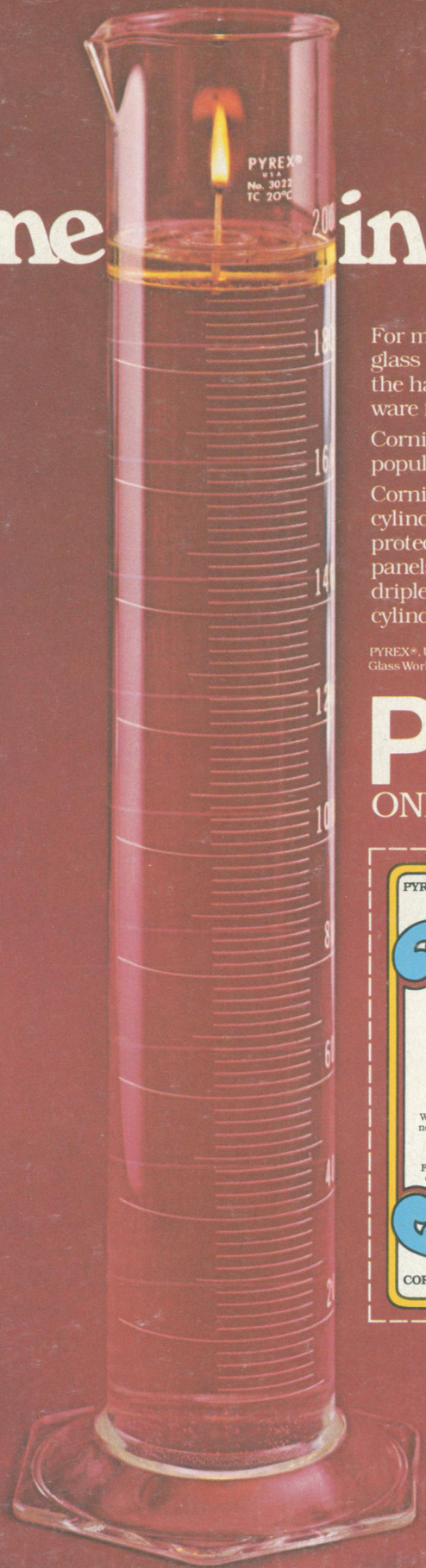

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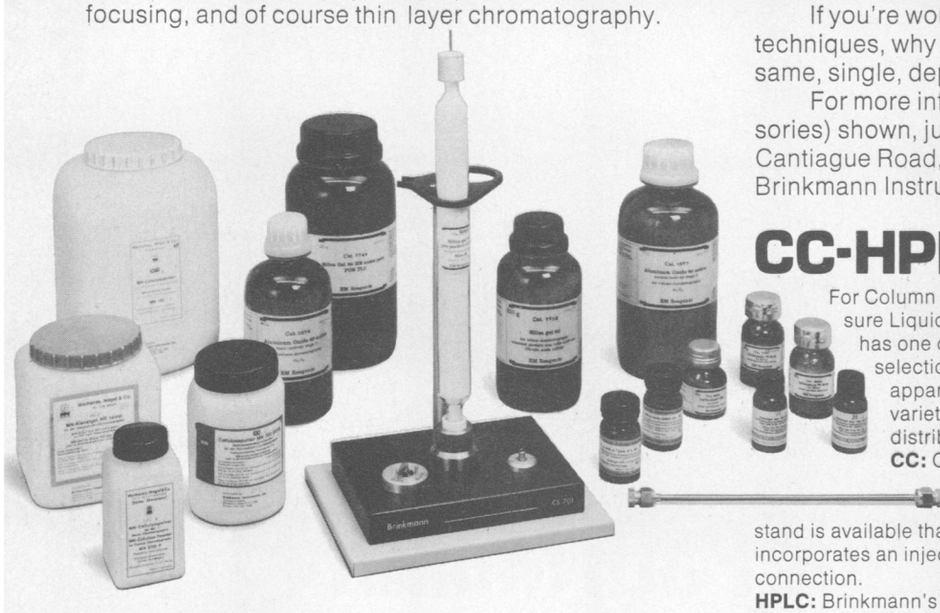

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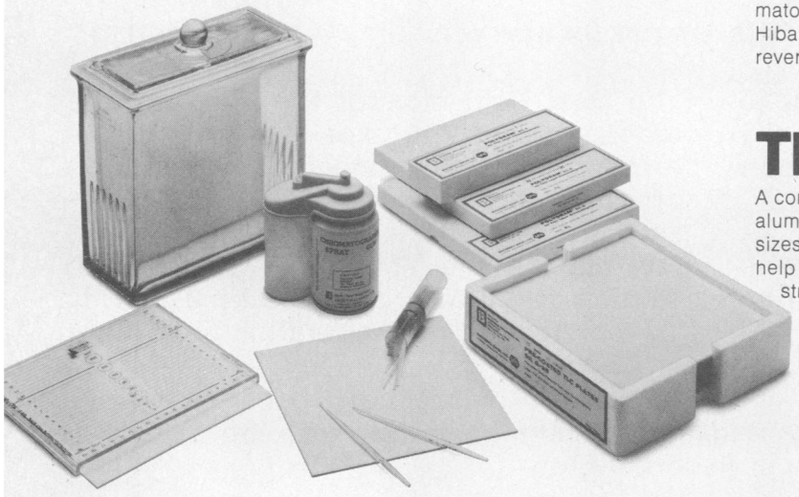

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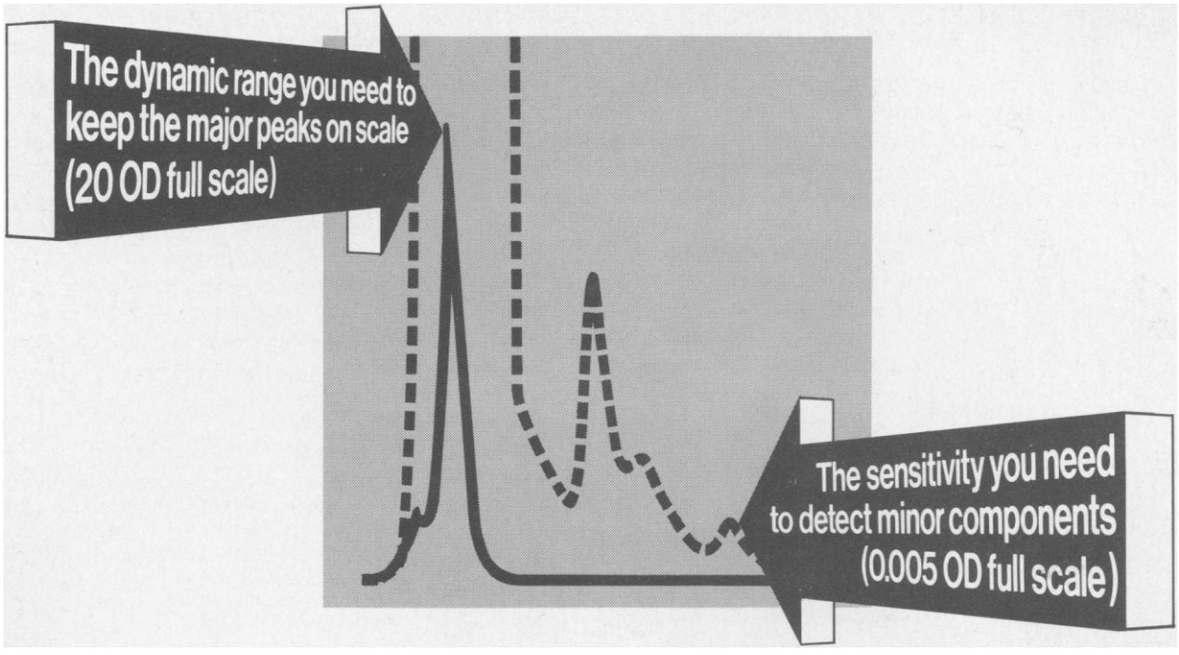

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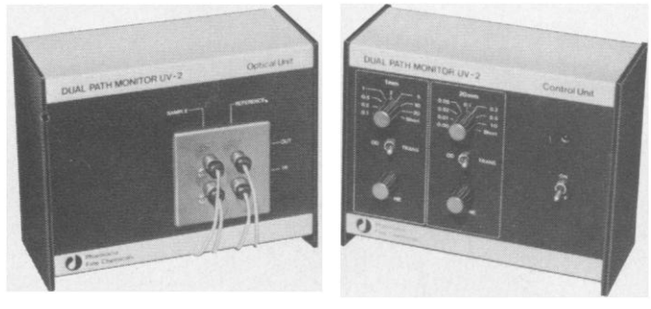

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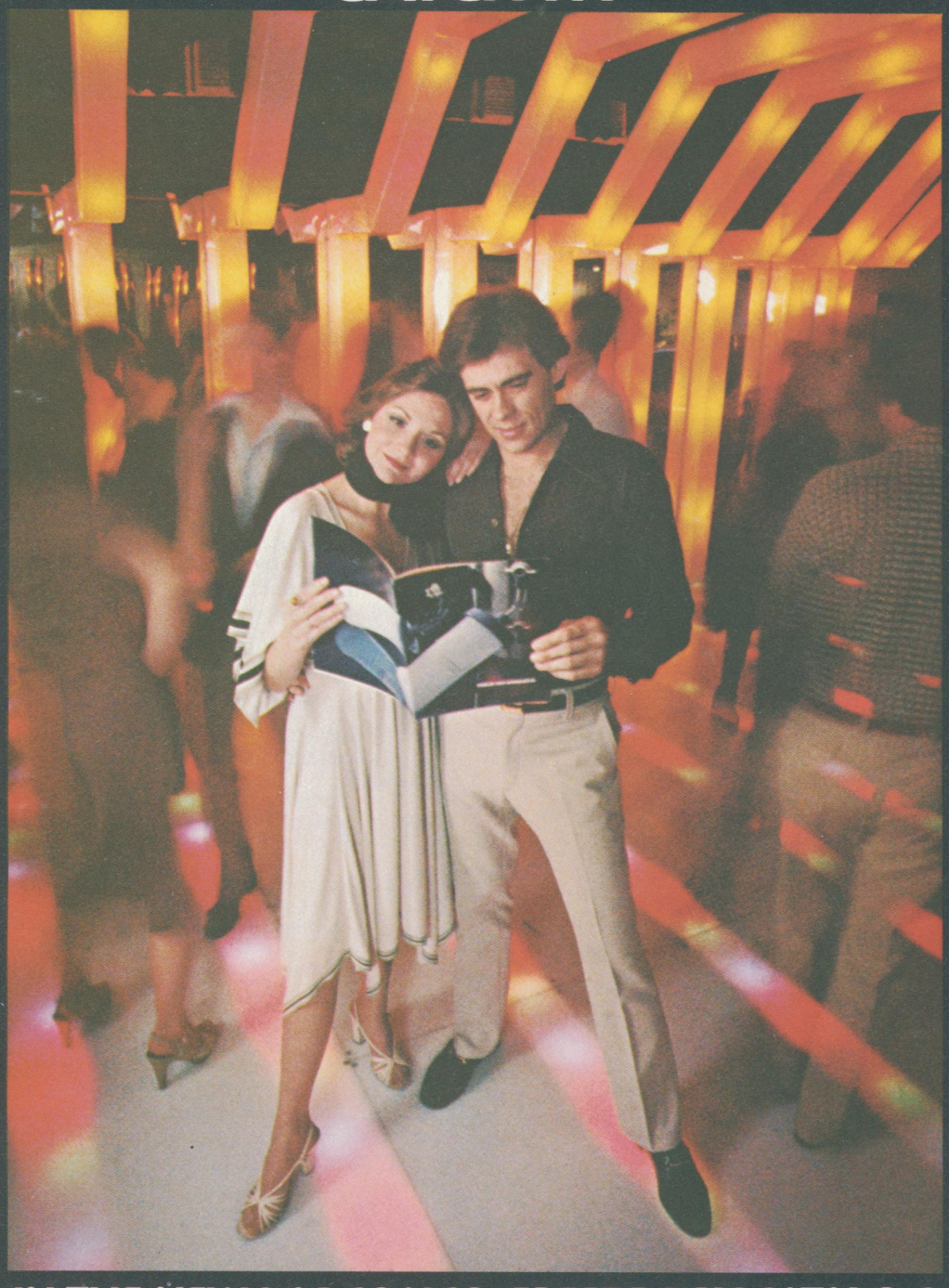

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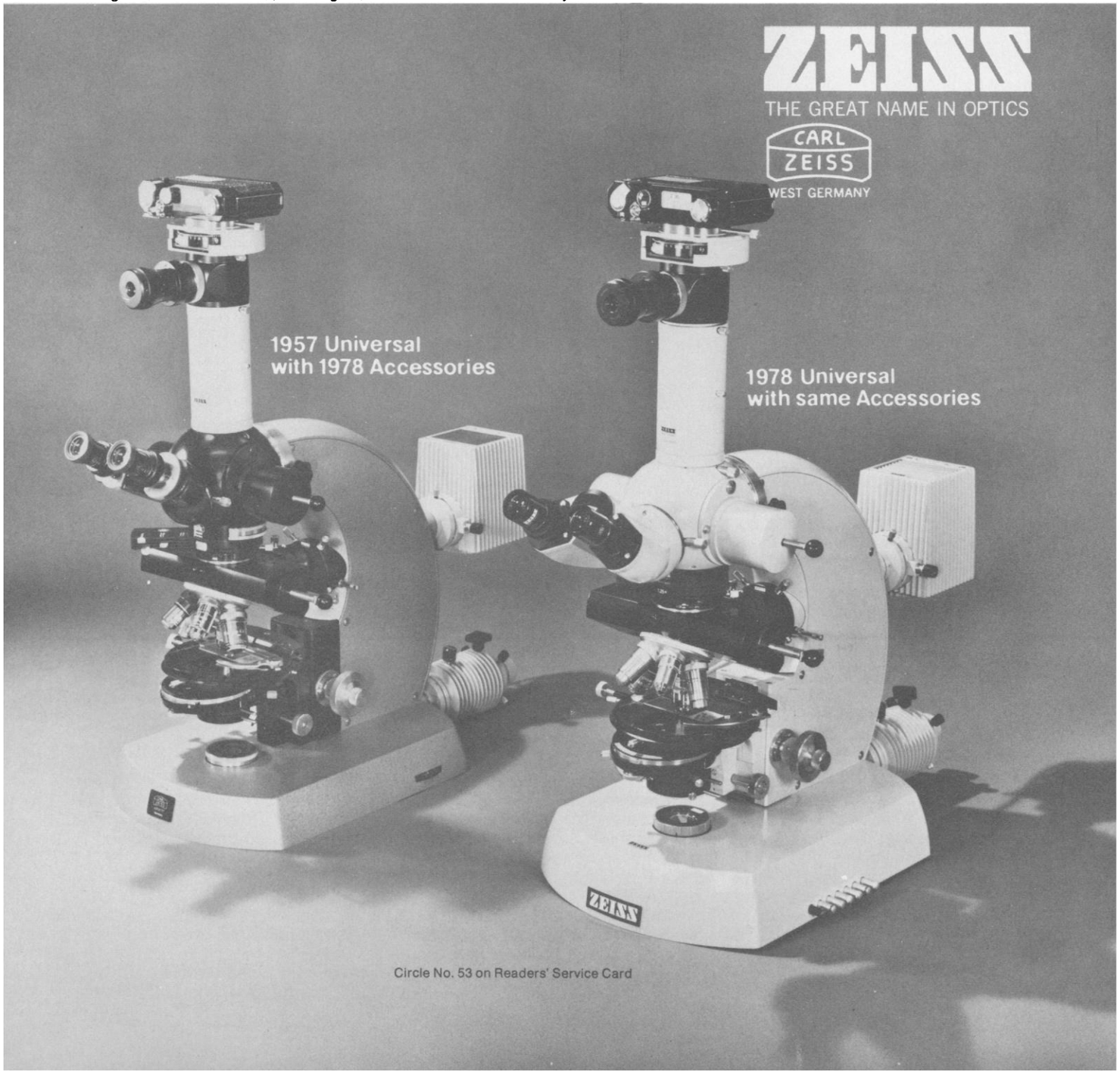

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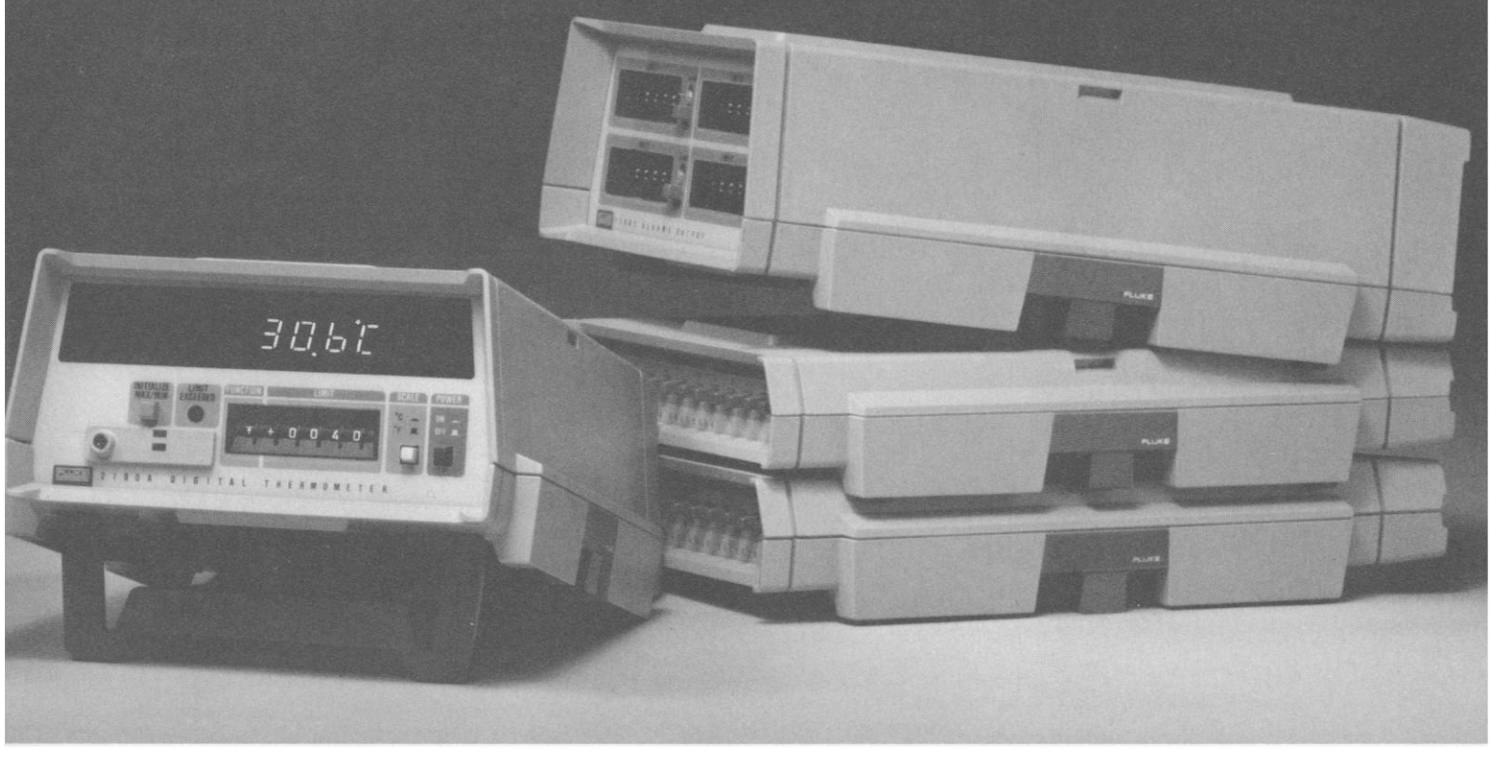

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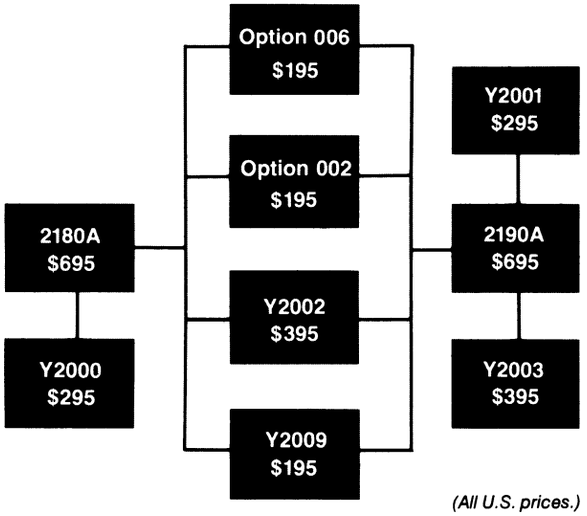

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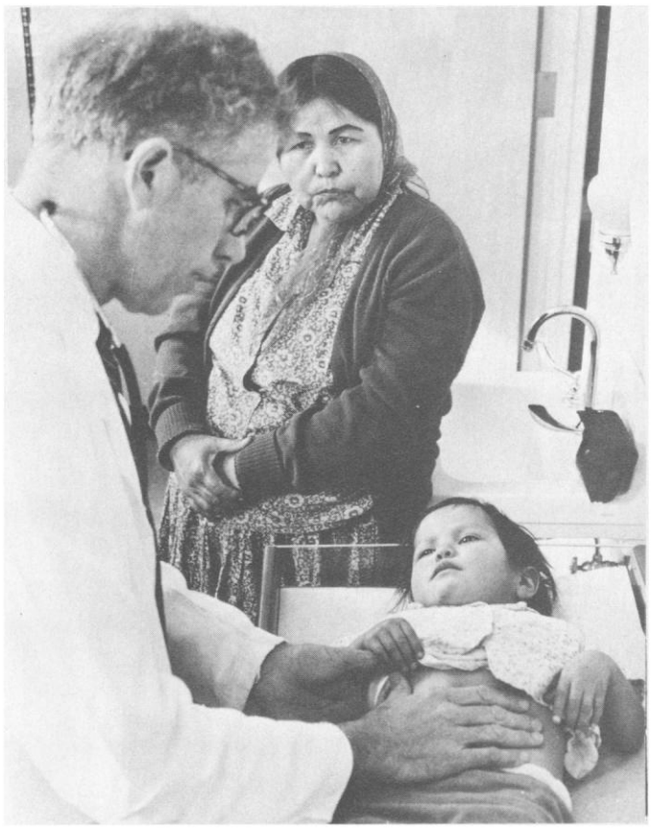

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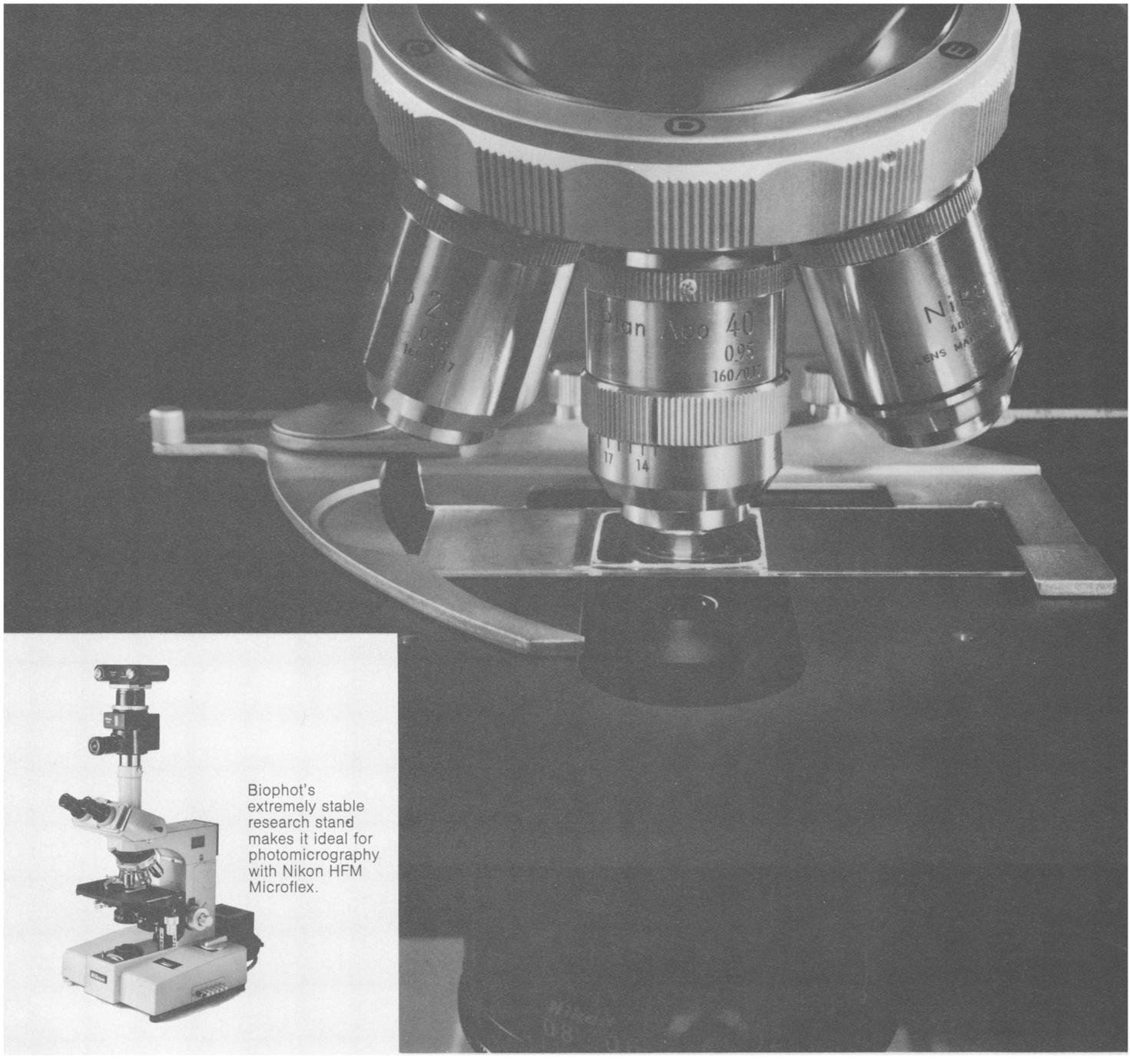

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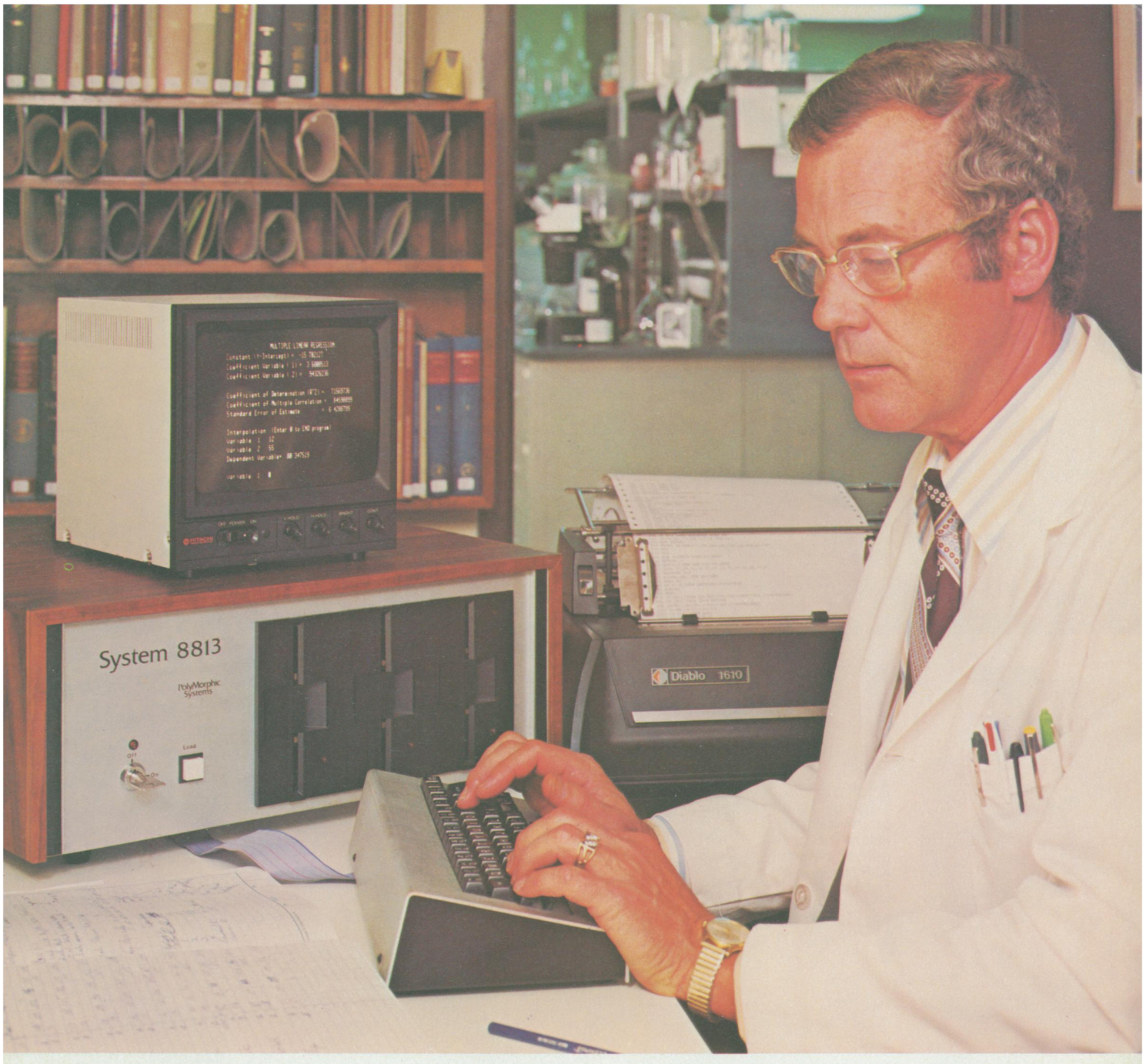

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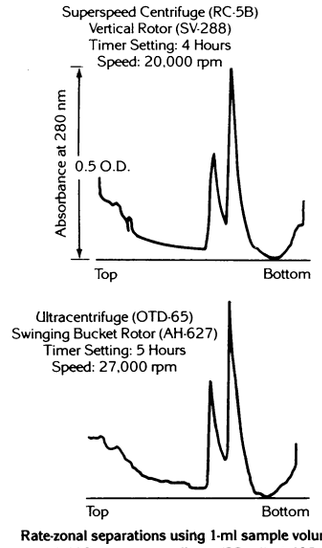

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*U.S. Patent 3,998,383

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LETTERS

Tenure Review

I welcome Ernst Mayr's editorial (24 March, p. 1294) advocating periodic review of tenure at our academic institutions. However, the main appeal of his proposal rests not so much with the dispatching of the "drones," as he calls them (most of whom are harmless souls fulfilling humble academic tasks anyway), but with the dispatching of those inflamed, highly vocal, pestilential earthshakers that make our academic lives utterly miserable by spasmodically convulsing what would otherwise be a supremely calm, serene, tranquil, and placid academic world. I list below some such cursed people together with what would surely have been the departmental vote, and the action the administration did in fact take.

Name	Vote of department	Action by administration
Pythagoras	Against	Exile
Socrates	Against	Poisoning
Christ, Jesus	Against	Crucifixion
Alighieri, Dante	Against	Exile
Savonarola, Girolamo	Against	Incineration
Bruno, Giordano	Against	Incineration
Galilei, Galileo	Against	House arrest
Marx, Karl	Against	Exile
Freud, Sigmund	Against	Exile

CESARE EMILIANI

Department of Geology, University of Miami, Miami, Florida 33124

Mayr's comments on tenure require a prompt response. They appear to offer a sensible and easily implemented solution to the problem posed by incompetent but tenured faculty. Unfortunately, however, while Mayr tries to preserve some of the protection afforded by tenure, his proposal needs to be vigorously resisted, for it would more probably lead to an undermining of tenure without necessarily bringing the benefits he seeks.

The major benefit conferred by tenure is the freedom of faculty members to study, discuss, and explore without fear views and topics that may be highly unpopular or controversial. Most scientists pursue careers that are models of conformity and caution, but some may wish to be more adventurous. Some areas of research can raise strong passions: observe, for example, the debates over recombinant DNA and sociobiology. If scientists in these areas were subject to renewable contracts (even if termed "ten-

ure"), it is safe to predict that, for many, caution would increase as the renewal date approached, and topics that may seem of major scientific interest would be neglected.

There is another serious objection to the proposal for periodic tenure reviews. Mayr suggests that the initial review come from a department committee. One might expect that this will often lead to leniency on the part of the reviewers in the hope of similar treatment when their own tenure comes up for review. Alternatively, the review might well provide an excellent opportunity to get rid of an abrasive colleague, and this same hazard exists if the review were instead to be undertaken by the chairperson. Indeed, extensive experience with procedures devised by the American Association of University Professors has shown that a major proportion of the threats to faculty members come from other faculty members and from department heads and deans who once were (or still are) faculty members. The apparently attractive idea of tenure review bristles with problems of implementation that are at least as objectionable as those it is designed to handle.

It is not only on the frontiers of research that feelings become inflamed and faculty positions are threatened. Some of us hope that more university scientists will become engaged in what Ravetz has termed "critical science" (*1*). This involvement in current issues does not need to be partisan but can be in the direction of elucidating complex technical issues to a broader public in order to foster an informed debate. Here again, these scientists need the protection of tenure, for, it is clear, those employed in industrial and government laboratories do not have the freedom to engage in these issues unless they are generally on the side of their sponsors. University science departments will probably provide virtually the only source of independent comment, and university scientists will not be able to play a responsible role if their jobs are in jeopardy. Again, this is not some hypothetical possibility: as "critical science" has developed in the United States, government and industrial scientists have been conspicuous by their silence or their scarcity. . . .

M. W. FRIEDLANDER

Department of Physics, Washington University, St. Louis, Missouri 63130

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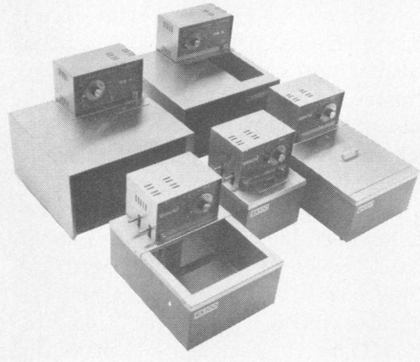

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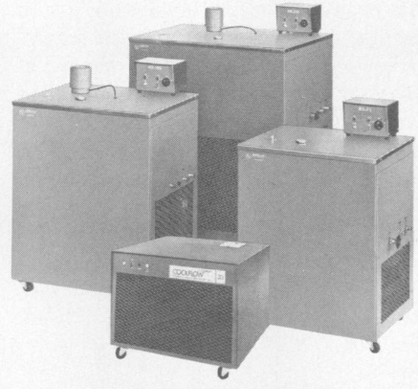

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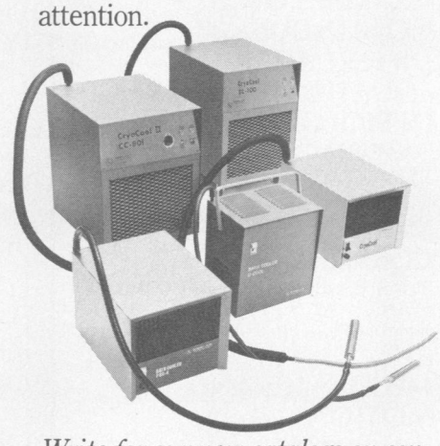

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able and with less red tape than the annual establishment of committees to review and hold hearings on 10 percent of the faculty. For instance, this category of "incompetent and thoroughly lazy" faculty (How large is it really? Has it recently increased? In absolute or in relative terms?) could be quite easily dealt with if universities were to split faculty remuneration into two subsets. The first, based upon rank and seniority, would be defined by the job, would reflect tenure, and would be immutable. The second portion of the remuneration would be awarded on the basis of a scheme that evaluates factors such as teaching, research, and service to the university. The level of the secondary reward would reflect all the considerations usually applied in salary decisions, including the value of the employee in the national marketplace. The scheme could also incorporate negative increments of the merit fraction of remuneration.

Such an approach would divide the "risk." Universities would be assured that only part of their resources could ever be locked into "inadequate" faculty, while maverick faculty would remain assured of a minimum level of security, allowing them to take stands on issues likely to provoke retribution. Those funds made available by the negative increments could indeed be used for the employment of promising new faculty.

All that would be needed to implement such an administrative scheme is the willingness to make tough decisions. But that is already needed today, not just at the time of hiring and when initial recommendation for promotion is made, but when salary increments are awarded and when space and "research support" are allocated. Faculty inadequacy often reflects administrative inadequacy on one or another level. Abrogating tenure is unlikely to solve that problem.

CARL GANS
Division of Biological Sciences, University of Michigan, Ann Arbor 48109

Mayr makes an excellent point: not the abolition of tenure but a system of tenure review is required in our institutions of higher learning (and by extension, all educational institutions). But the program he proposes is not quite tenure review so much as a series of 5- to 10-year contracts for faculty members. At the University of Delaware we have instituted a system of true tenure review at somewhat shorter intervals than those proposed. All tenured associate professors must be reviewed by a faculty committee appointed by the department chairperson every 3 to 5 years; all full professors must be reviewed every 5 to 7 years.

This system, in operation since 1972, has had excellent results so far, mainly because it does not emphasize the search for incompetence but rather the positive aspect of providing useful comments and constructive criticism to faculty members from their peers. Peer pressure, we have found, is perhaps the single most effective means of getting faculty members who have somehow grown stale in their teaching or slow in their research to renew themselves and make fresh contributions to the university, their profession, and above all their students. Of course, the occasional recalcitrant or hopeless case does turn up, and more forceful measures have to be employed (the review system does make allowance for incompetence proceedings to be initiated, when necessary). But to date, no charges have been brought for dismissal, and everyone has a healthier sense of the true meaning of tenure. Still more positively, several associate professors have found that the peer review system can lead to serious consideration for promotion, an outcome actually planned for by the framers of the review system.

Tenure reviews, like all evaluations, do take time. But I can think of few more useful committee assignments for faculty members than this one which, when taken in the right way, can go a long way to promote everyone's best interests.

JAY L. HALIO
Office of the Provost, University of Delaware, Newark 19711

Some of the letters tend to obscure the basic issue of my editorial. What I deplored was that tenure had drifted away from its original justification of protecting academic freedom to take on the meaning of a job security device, including the security of the incompetent. The opponents of tenure review claim—and this may well be completely true for certain institutions—that one cannot separate the two. For many, possibly most, institutions this is not true. Not only the letter from Halio, but personal experiences, prove that the two can be separated in most cases. I once worked for a "moral tenure only" institution, and in more than 20 years, only one staff member was dismissed, for a complete failure to perform his duties.

The critics of tenure review like to refer to it as the "abolition of tenure." This is most misleading. Taking a few rotten apples out of the barrel helps to preserve the quality of the remaining ones. In fact, it strengthens the major ob-

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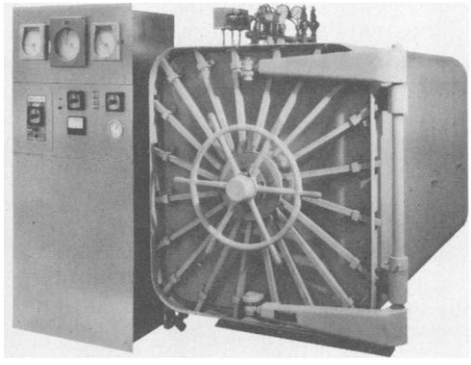

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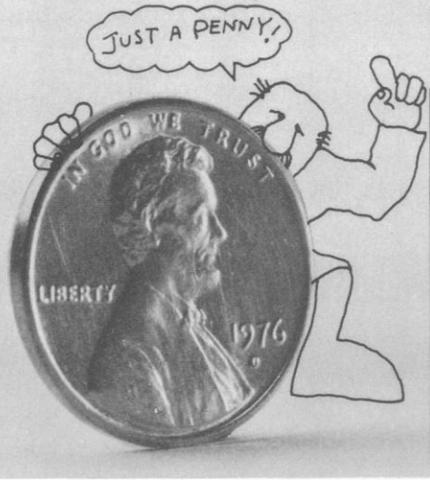

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jective of tenure, the protection of academic freedom. It is axiomatic in our American thinking that no system should be without its checks and balances. This is the major virtue of tenure review.

Let me say at once that I fully agree with Friedlander that "the apparently attractive idea of tenure review bristles with problems of implementation," but so would any of the methods proposed by the opponents. Imagine what turmoil it would cause if a faculty committee had to vote annually on half the salary of each colleague by evaluating "factors such as teaching, research, and service to the university," as proposed by Gans, who continues, "The scheme could also incorporate negative increments of the merit fraction of remuneration."

It is clear that the method of implementation of tenure review is of crucial importance. Any authoritarian procedure would be fatal. The principle of checks and balances would have to be scrupulously adhered to. This means, for instance, that the committee might have to be composed in part of members elected by their colleagues (not the chairman) and in part of members appointed by a dean (or other higher administrative officer). There would have to be an appropriate appeals procedure, and so forth. Needless to say, existing watchdog committees (the American Association of University Professors, the Civil Liberties Union) would continue to be available in the case of a miscarriage of a tenure review.

Discussion of the tenure problem with scores of colleagues from many types of institutions has made it very evident to me that different institutions will require different review systems. Obviously, there is no single perfect system, and the faculty of each university will have to decide which particular system would be most suitable for them. Tenure review procedures are actually already in operation at various institutions, and—if I am correctly informed—have worked reasonably well. One would like to hear more from such institutions.

Several colleagues have pointed out to me that the precipitous granting of tenure during the 1950's and 1960's is responsible for much of our problem and that much trouble could be avoided in the future if one were to return to the more deliberate system of the 1930's and a more careful review of the record before full tenure and full professorship is granted. Zelby is entirely right when saying that the future incompetence of an appointee could often have been predicted if higher standards had been employed by the committee which originally recommended tenure. Indeed, tightening up the procedure of tenure granting might go a long way toward making the cry for tenure review less urgent. In this I also agree with Schwartz. However, I find no evidence for his claim that the academic tenure system does not differ from what is "practiced in industry to cover similar problems." Actually, the firing of unproductive or unsuccessful managers is a daily practice in most industries.

Those who oppose tenure review think that there are adequate procedures available to get rid of the failures: "The thoroughly lazy or incompetent can be dismissed for cause; just be sure that you have the evidence," says Schwartz. Gans likewise claims "Administrative alternatives [for the dismissal of incompetent professors] have always been available and with less red tape than the annual establishment of committees. . . ." Unfortunately, this is wishful thinking. Even with overwhelming evidence, skillful lawyers can cause so much trouble and disrupt academic life to such an extent that I know of several cases where the university or college found it cheaper to pension the delinquent professor at full salary than to go through the court battles.

As far as Emiliani's letter is concerned, he seems to have better access to historical sources than I. I admit frankly that I was unaware that Jesus Christ had tenure at an academic institution and that Socrates lost job and life on the recommendation of a tenure review committee! Emiliani's sense of values seems to be different from mine, because for me the endeavor to uphold academic integrity is not a suitable subject for jokes.

The problem before us is clearly one of finding the lesser of two evils. Tenure review is not perfect, but a tenure system so rigid that it unfailingly protects the thoroughly incompetent is even worse. The opponents of tenure review have so far failed to come up with a better alternative. As the abuses of tenure get worse, and this is what seems to have been happening in recent decades, the pressures of the outside world (for instance, the parents paying ever higher tuition fees) will rise to abolish tenure altogether. This threat can be blunted only if the academic community has the courage and integrity to institute its own reforms. I am convinced that the current laissez-faire attitude and shirking of responsibility cannot go on forever.

ERNST MAYR

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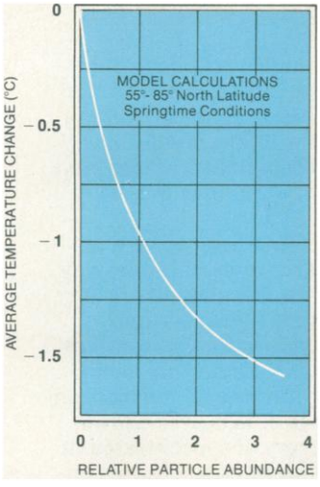
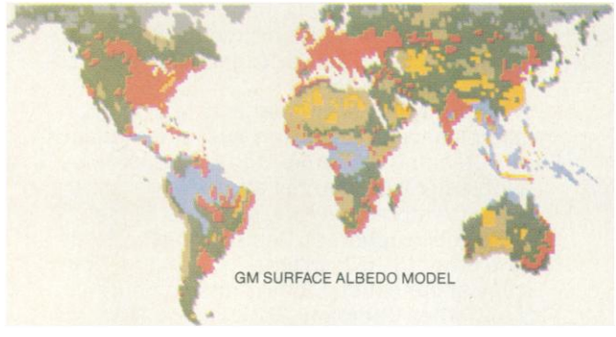


In other experiments, we studied over 30 parameters . . . gas concentrations, albedos (reflectivities of the earth's surfaces), cloud and particle abundances, Rayleigh scattering coefficients. The goal has been to understand global temperature response to changes in O_3, CO_2, particles, and the chlorofluoromethanes.



So far, our findings lead to these main conclusions:

- Surface albedo exerts the most influence on global temperature change. Next in importance are Rayleigh scattering, humidity of the lower troposphere, and CO_2.
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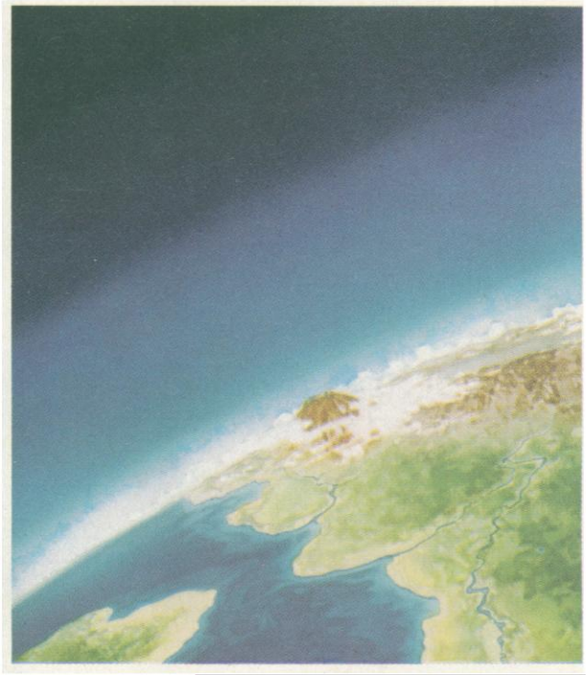

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12 May 1978, Volume 200, Number 4342 **SCIENCE**

Employment Opportunities for Scientists

Universities are in the midst of a prolonged era of adjustment to changed circumstances. During the 1960's they enjoyed growing enrollments, and increased budgets, but they are now experiencing financial pressures and they note that demographic factors guarantee smaller student bodies during the next decade. At the same time job opportunities are changing for their students.

The contrast between the past and the present is especially painful for some science departments. Following Sputnik, enrollments increased, large numbers of graduate fellowships were made available, research grants were readily forthcoming, and teaching loads were diminished. These factors combined to create a large number of openings for tenured faculty. New Ph.D. granting programs were established at many schools. A principal activity of science departments was to train an ever-increasing crop of Ph.D.'s to become professors at universities. A prevalent expectation was that rapid expansion of research budgets and faculties would go on indefinitely. But, as has been observed in many other instances, fast exponential growth always comes to an end and often a painful one.

The graduate fellowships were first to go. They vanished soon after some space engineers became unemployed and one of them was photographed driving a taxi. About that time enrollments began to level off. In the intervening years, research grants have become more difficult to obtain and there has been a tendency to increase teaching loads. In consequence, only a relatively small number of tenured positions are now open. For example, last year chemistry departments granted more than 1500 Ph.D. degrees. At the same time, less than 300 tenured places became available. About 100 suitable positions occurred in government. Some of the Ph.D.'s obtained postdoctoral fellowships, but that is only a temporary expedient. If holders of advanced degrees are to find employment, a large fraction of them must be hired by business and industry.

In some respects opportunities in industry are more limited than at the universities; in other respects there is more choice. A few of the companies maintain excellent fundamental research programs. The limited number of scientists so engaged have access to the best of new research equipment. However, only a small fraction of scientists entering industrial employment can expect to conduct the kind of research that they performed at universities. Instead they must engage in activities for which their training has not been ideal, such as applied research, engineering, and management.

In view of the changed job opportunities for their graduates, science departments may find it desirable to offer alternatives to their present curricula. Personnel officers in industry whom I have interviewed are very complimentary about the quality of graduates with respect to training in science. However, they find the young people to be ignorant about business. Most of the graduates are also deficient in communication skills. For scientists, some training in engineering would be useful. A measure of its value is given by the disparate starting salaries of B.S. chemists and chemical engineers. Beginning engineers receive about 30 percent more (a total of $1500 per month) and their advancement to high positions in the companies is more probable.

At one time many professors in the physical sciences at leading universities were consultants to industry. They obtained support for their research and often for graduate students. They were in a position to place their students in jobs. When large-scale government grants became available, industry largely withdrew its support and there was less interaction with academia. The present and prospective circumstances seem to call for a resumption of closer ties. That is not to say that the universities should become subservient. However, unless faculties are somewhat responsive to their students' needs, the young people are likely to vote with their feet.

—PHILIP H. ABELSON

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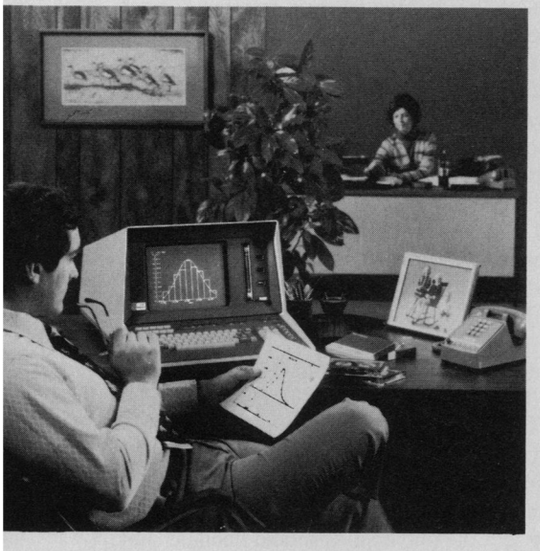

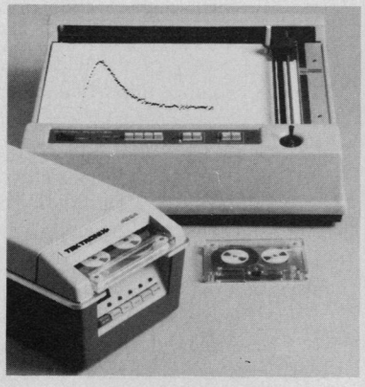

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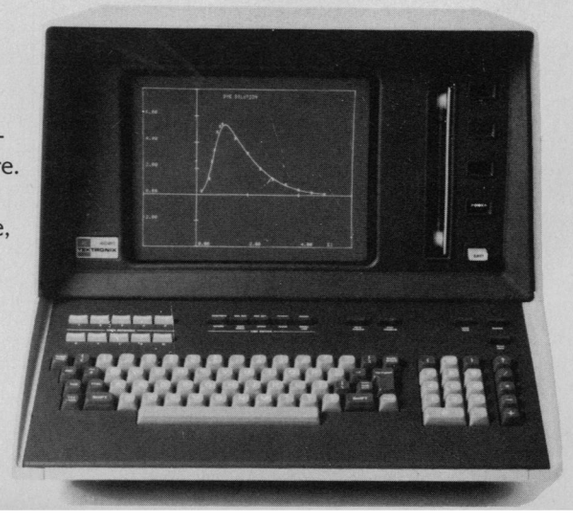

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