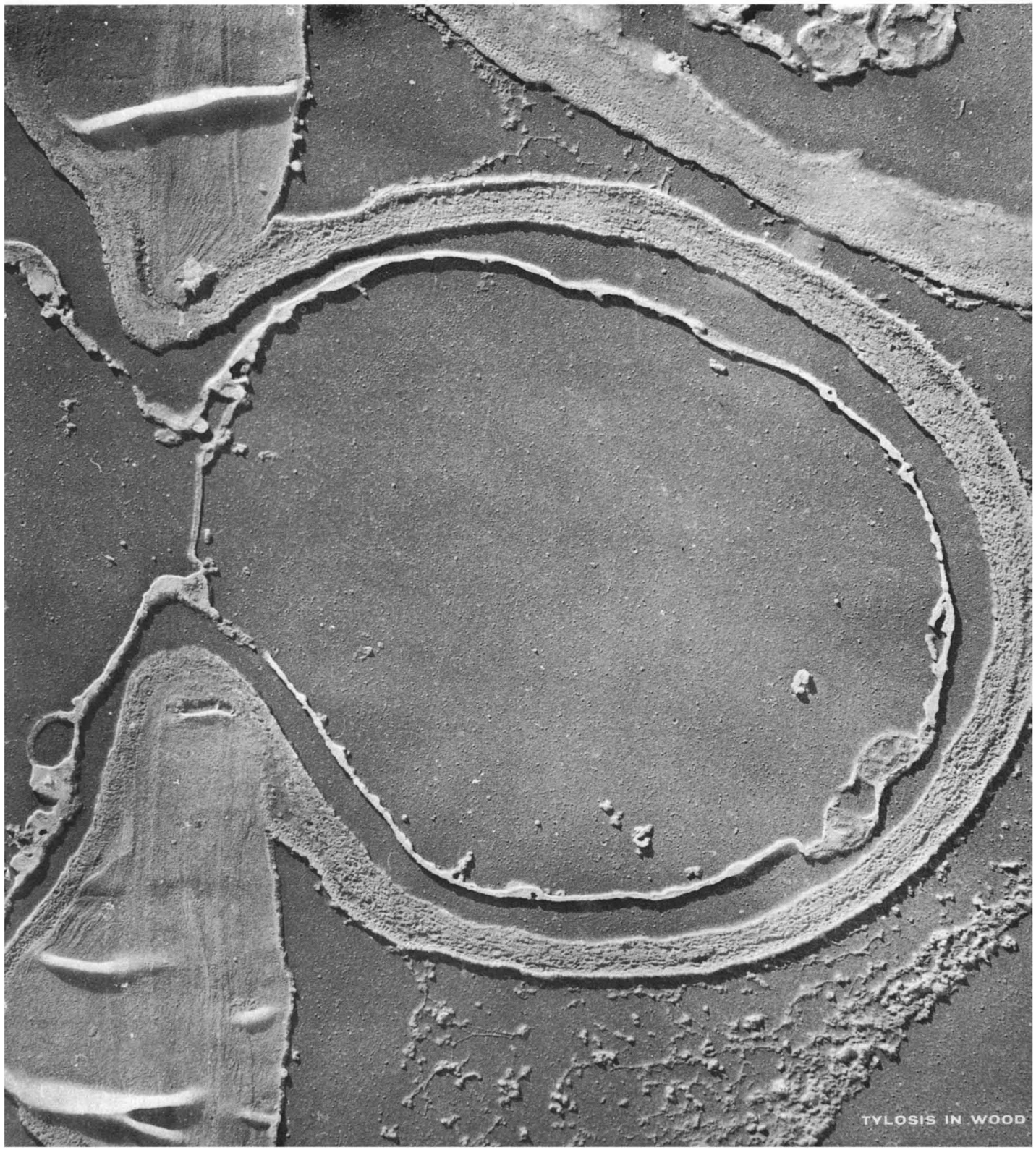
SCIENCE

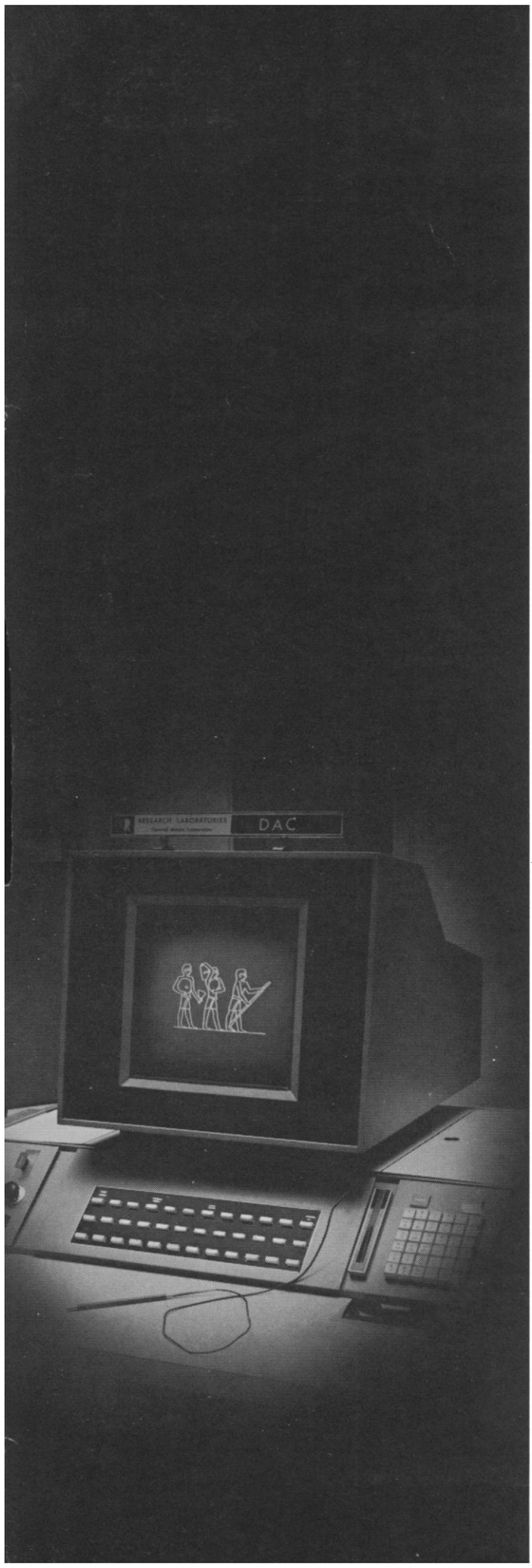
2 September 1966

Vol. 153, No. 3740

AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE



TYLOSIS IN WOOD



One of a series briefly describing GM's research in depth

Pictures spoken here

If ancient man had invented the digital computer, we'd have no problem. His language was pictures.

But the alphabet came along, and we're saddled with computers whose native tongue is one of letters, numbers, and punched cards. Some modern men speak this language, too. But not all.

The designer, for instance, represents ideas in drawings. With proper schooling, so can the computer. Two years ago we announced the first such development: the DAC system, design augmented by computers. It used an educated computer speaking some of the designer's language. That was the first big step . . . a move to free the man from routine tasks, to let him spend more time creatively.

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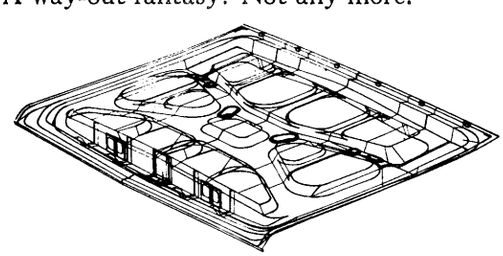
The goal: Let the designer put a rough sketch on the computer console and make instantaneous changes as he develops his idea into a final exact design—all without translating into computer language.

A way-out fantasy? Not any more.



Typical automobile surface.

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1. Auler, H., Banzer, G., Krebsfrosch, Z. F., 53, 65 (1942) • 2. Figge, F. H. J., Diehl, W. K., Peck, G. C., Mack, H. P., Cancer Res. 2, 105 (1956) • 3. Lipson, R. L., Baldes, E. J., Olsen, A. M., J. Natl. Cancer Inst. 26, 1 (1961) • The literature references should not be interpreted as either an endorsement or disapproval of the biochemical by the cited investigation.

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SCIENCE

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AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE

COVER

Developing tylosis in the wood of *Eucalyptus obliqua*. In general, a tylosis is formed by growth of a portion of a cell wall either into the lumen of a neighboring tracheary element or into an intercellular space, such as the duct of a resin canal. Such cellular outgrowths tend to fill the adjacent space, thus obstructing the movement of solutions (preservatives, pulping liquor) through the wood (Scale: about 1 cm = 1 micron). See page 1068. [R. C. Foster, Forest Products Laboratory, C.S.I.R.O., Melbourne, Australia]

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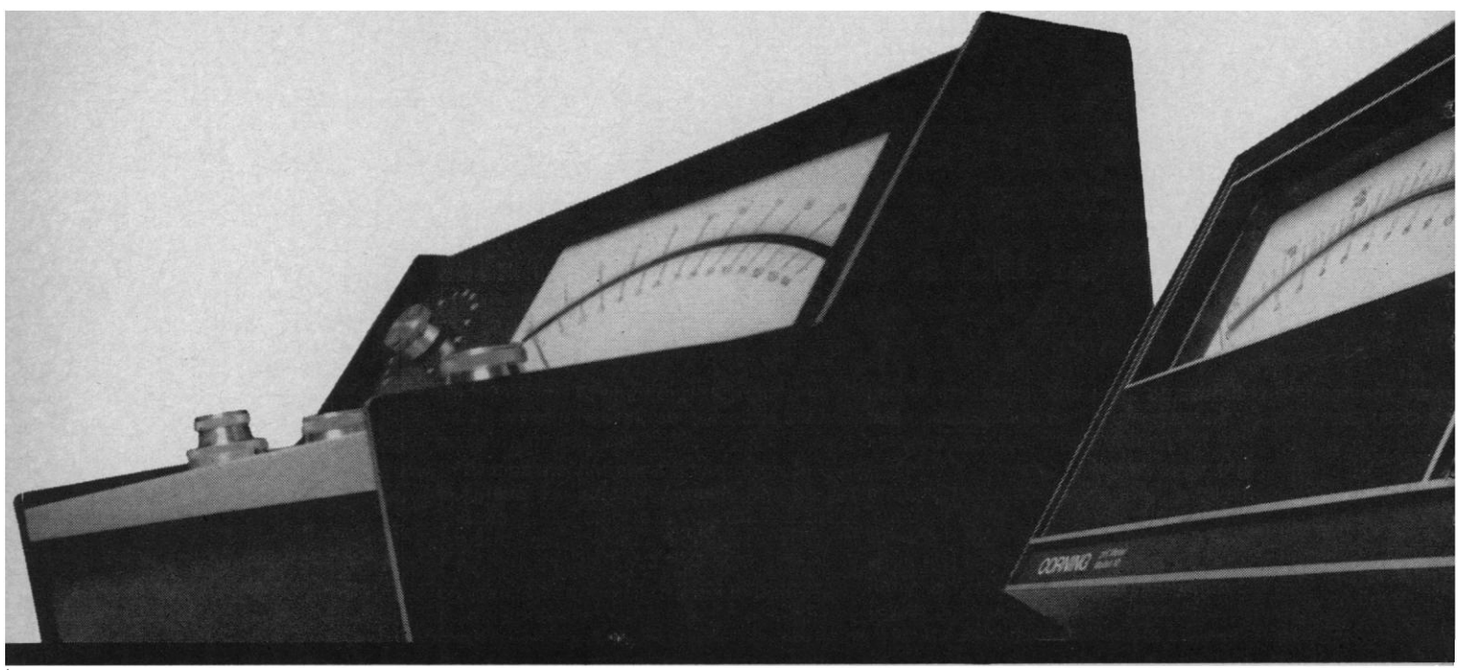

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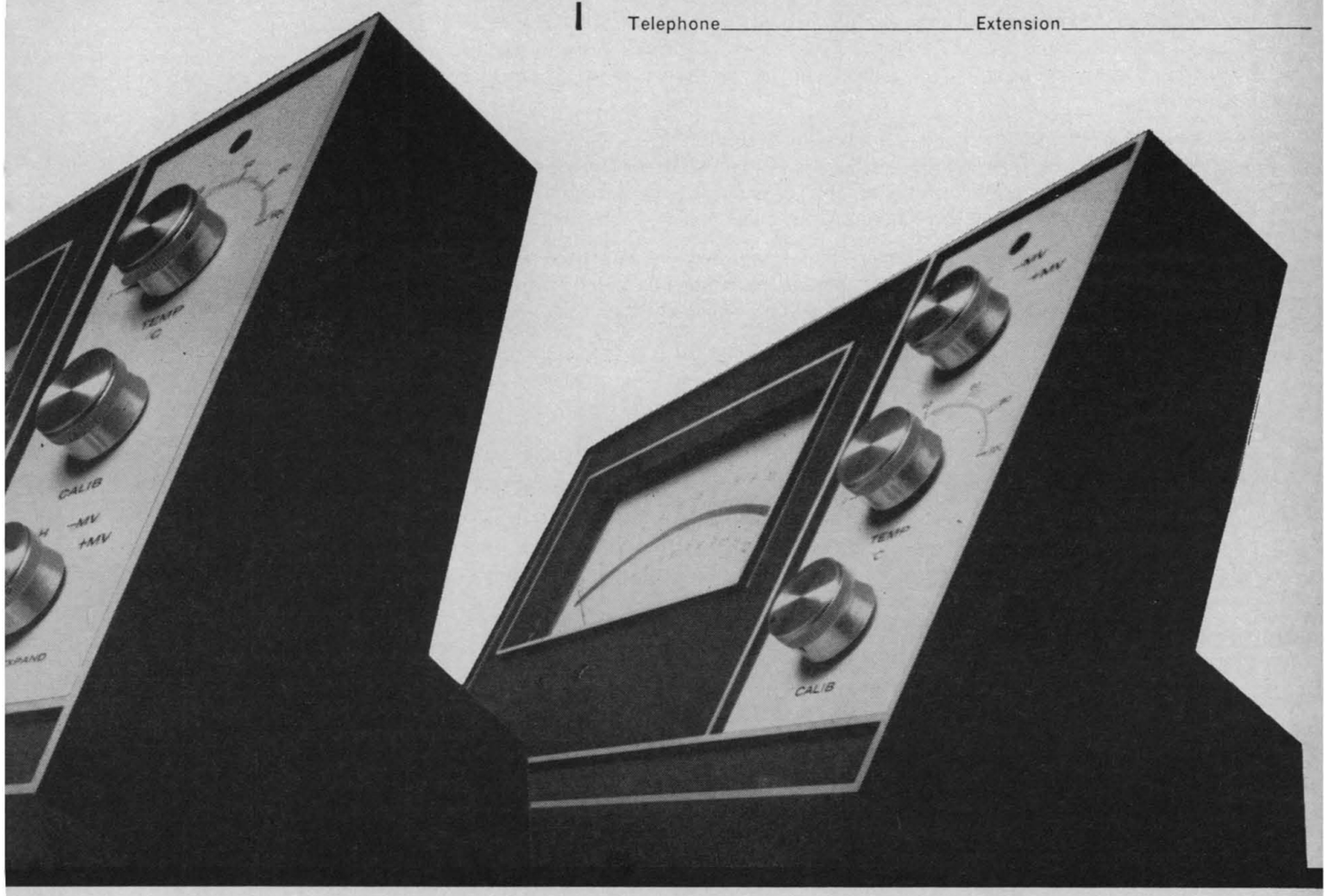

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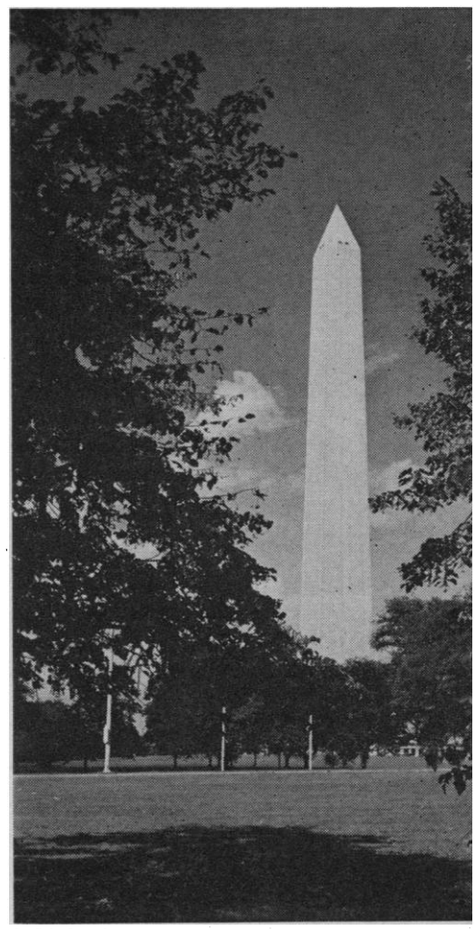

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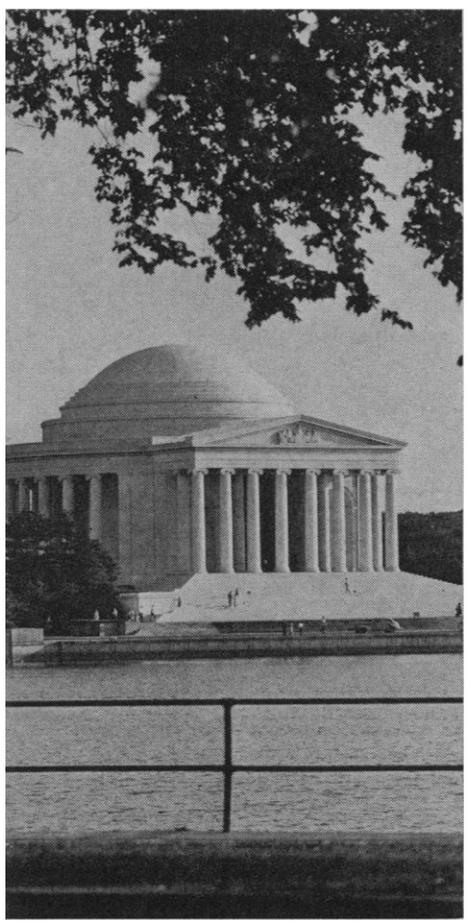

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The hotel sleeping accommodations are for your convenience in making your room reservation in Washington. **Please use the coupon below and send it directly to the AAAS Housing Bureau in Washington.** Give a definite date and estimated hour of arrival, and also your probable date of departure. The Housing Bureau will make the assignment and promptly send you a confirmation.

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to the kind of research that is going on in the university. The type of research the university now undertakes to do cannot even have been imagined before federal support came into existence.

It is generally accepted in the major universities that time devoted to research is academically expended and is vital to world and national, as well as to university, welfare, and may have no immediate or even visibly remote technological application. It is the national welfare which demands the present scale of research operations. The university may reasonably be expected to contribute to a salary of a faculty member in proportion to the time he spends on actual teaching, but beyond that point the amount of investment by the university cannot be expected to be commensurate with the size of the enterprise. The larger the enterprise the lower fractional investment there should be on the part of the university and, in truth and in deference to tradition, it should approach nil.

Congress and the granting agencies should understand that the function of the university is not to support research but to provide the atmosphere in which good research can be conducted. Provision of that atmosphere is the important thing.

MILTON BURTON

Radiation Laboratory,
University of Notre Dame,
Notre Dame, Indiana 46556

Don't Dam The Grand Canyon!

Luther Carter has presented an admirably dispassionate summary of water politics surrounding the proposed construction of Bridge Canyon and Marble Gorge dams in the Grand Canyon of the Colorado River. (News and Comment, 17 June, p. 1600). We do not feel dispassionate about the imminent loss of the intact Grand Canyon, one of the most wondrous works of nature, utterly unique, priceless, and irreplaceable. This loss is intolerable because it is senseless and unnecessary. Bridge Canyon and Marble Gorge dams will serve only one significant purpose, and that is to generate and sell hydroelectric power in order to help finance the Central Arizona Project. In the face of available coal and nuclear sources of power, only a committed politician could take seriously such a frightful proposal. The Grand Canyon is an awesomely high price the American people are being asked to pay for the bureaucratic rigidites of their government and their politics. If these dams are built, not only do we pay this terrible price, but our children, and their children, and all future generations also pay it. They won't sing praises to our lack of wisdom and imagination or to our indifference.

MURRAY A. LAMPERT
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On Scientific Illiterature

Within 4 weeks of each other, a leader in *Science* (Editorial, 18 Feb. p. 783) dealt with the gift of the gab as related to the procurement of grants for scientific research, and one in *Nature* (19 March) with the results of the latter, namely publication. A great deal of printing ink is being poured on the question of what to do about the cataract of information: "explosion" is hardly the word for what is occurring since this term refers to something that is sudden and finite. There is a case to be made for making publication of scientific results harder.

A man may pursue what, on the face of it, is useless research (UR). Again, he may work in a discipline that has high national prestige rating (NPR) or serves to alleviate the physical struggle for life. The example of nuclear studies, that involved a change from UR to NPR in the first half of this century, shows that, in the former case, competition is less severe than in the latter. It is only a surmise, but I hope a permissible one, that such competition contributes to the paper waste that many workers see in their own fields. If, as the article in *Nature* urges, the consumption of literature has to be rendered more effective, what about its production? Why should we be provided with umbrellas when it may be possible to control the cloud burst? Editors should not allow themselves to be blinded by science. Writing can be terse even though decorative, economical without being austere. Articles can be reduced by as much as 33 percent in length without the loss of one iota of information: this is always done easily with writing other

than one's own. Certainly a saving of 10 percent is in most cases too easy for words.

There is, moreover, the question of the selection of material. Rigorous refereeing is not to be equated with censorship. No paper is likely to suffer from the rough or tender attention that a pair of eyes bestows on it before publication. If editors are afraid to sacrifice copy to quality, then they may be justly said to be contributing to the consumer's difficulties.

However, the most far-reaching effect on the damming of the information cataract is one which involves collaboration between the scientific journals themselves. They need to communicate with one another. If each journal were to inform other journals of the receipt of a paper, there would be time for consolidation of the results of two or more studies before publication. The number of scientists at present still manages to exceed that of journals, and contact may be easier to achieve indirectly by this than by any other means. Such inter-journal collaboration might add a little to the delay of publication. At the same time, it would enable editors to form a picture of the relative importance of a contribution irrespective of the referee's comments.

The chance of producing a more accomplished work would increase. The consumer would be rendered an additional service, and the saving of time and effort entailed would more than compensate for its cost. Even if journals were to lose from transferring copy to an earlier recipient, they would gain on quality. Who knows? By reducing duplication and question and answer papers, they might find room for new ventures.

R. A. WEALE
Institute of Ophthalmology, University of London, W.C.1

That Biblical Spider: The End of The Series

Here is the final version, because it is also the original version. The original text in Hebrew (Book of Tehilim 90:9) reads:

כִּי כָל־יָמֵינוּ פָּנוּ בְעֶבְרָתֶךָ,
כִּלִּינוּ שָׁנֵינוּ כְּמוֹ־הֶגֶה׃

There is no sign of a spider.

SHLOMO SHALIT
5519 South Blackstone Avenue, Chicago, Illinois

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Animal Care Legislation

Congress has passed, and the President has signed, a bill that establishes federal controls over the transportation, sale, and handling of animals intended for research use (*Science*, 19 August). The bill is a compromise in which neither advocates nor opponents of federal control got what they wanted.

The position of scientists on this matter has long been clear. As far back as 1881 the Medical Congress meeting in London unanimously resolved: "That this Congress records its conviction that experiments on living animals have proved of the utmost service to medicine in the past, and are indispensable for its future progress; that, accordingly, while strongly deprecating the infliction of unnecessary pain, it is of opinion that, in the interest of men and animals, it is not desirable to restrict competent persons in the performance of such experiments."

Advocates of federal control—the antivivisectionists of the past who now prefer the more positive sounding label *animal welfare*—contend that substantial unnecessary pain is inflicted; that animals are often ill fed, ill housed, and ill cared for in research laboratories and on the premises of animal dealers; that state laws do not prevent these abuses; and that federal controls are therefore necessary.

In the past, many legislative proposals have been introduced, but not brought to vote. Recently, however, the advocates of legislation have worked with unremitting vigor, and some time ago it became clear that some form of legislation was likely to be adopted. Congress still, however, had a number of choices. Should federal controls apply only to animal dealers, or also to research laboratories, and perhaps to research procedures? Should the legislation apply only to cats and dogs, or also to other animals? (Logically and ethically there would seem to be no reason to distinguish between a dog and a pig, but the emotional arguments center on cats and dogs, not on pigs or *Drosophila*.) Should the legislation concern itself only with safeguards and restrictions, or should it also offer positive aid to the improvement of animal-care facilities and procedures? The advice Congress received on these issues pointed in all directions. Congress did what the whole legislative process is designed to do: effect a compromise between conflicting points of view. The advocates of legislation have gotten part of what they asked for. But Congress acted with restraint; research will not be seriously handicapped. Additional government regulations have been established; regulatory machinery will be developed; and the taxpayer will have an additional bill to pay.

The long history of the controversy and the fact that no one got all he wanted make it seem unlikely that the argument will now end. Those who want stronger controls will continue to press. The new legislation is a compromise between what they wanted and the complete absence of federal controls. Another compromise in a few years is possible, and if that one comes, it will be between the present provisions and the stronger controls then being asked for. More stringent legislation need not be enacted, however, if biologists can persuade Congress that self-regulation through the American Association for the Accreditation of Laboratory Animal Care and other professional organizations is adequate to safeguard the welfare of the animals that are essential for biological and medical research and education.—DAEL WOLFLE

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