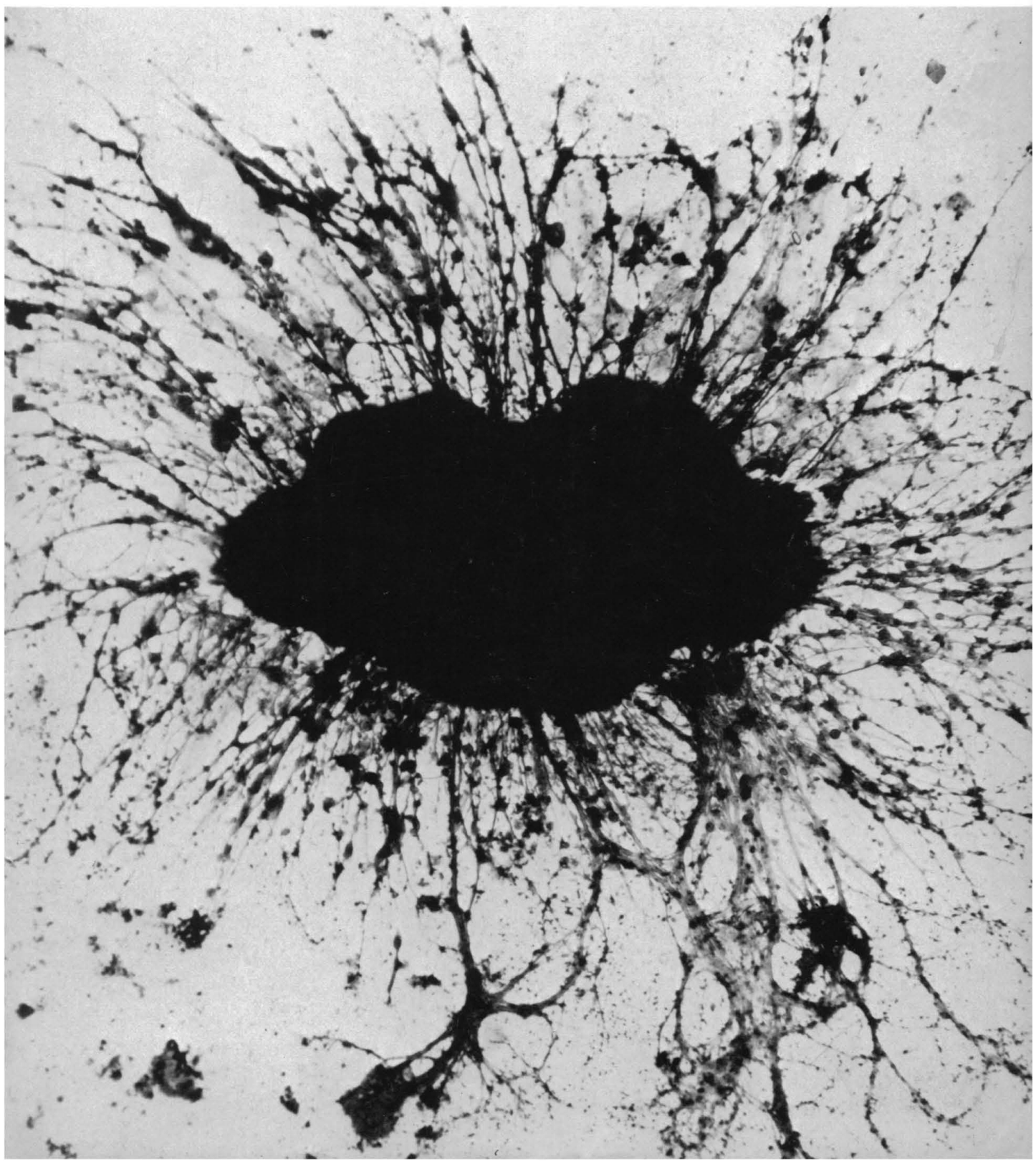
SCIENCE

31 October 1969
Vol. 166, No. 3905

AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE



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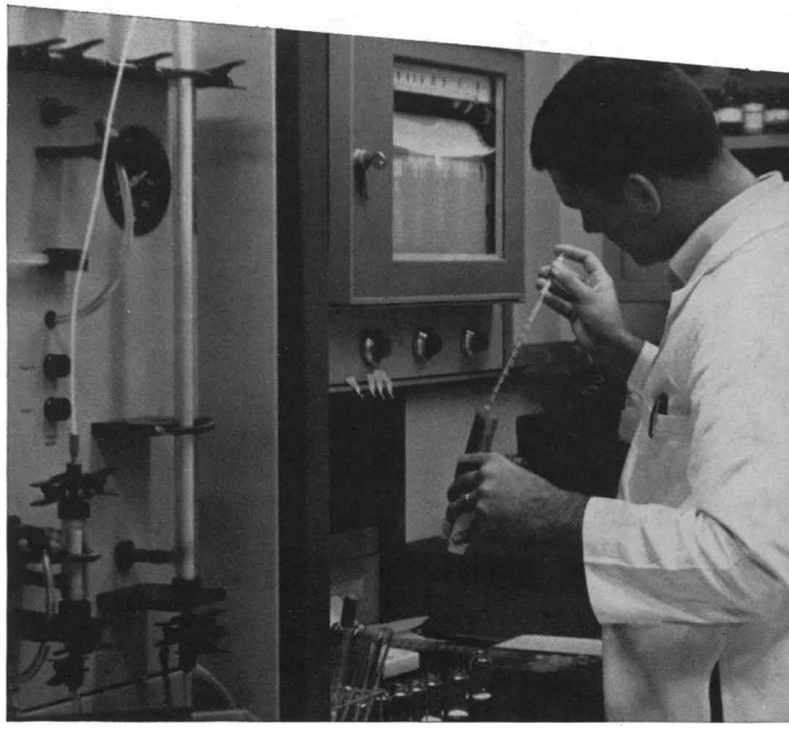

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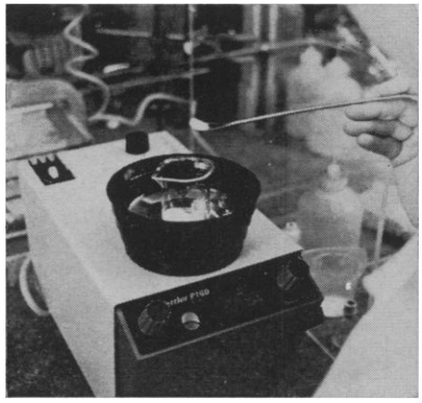

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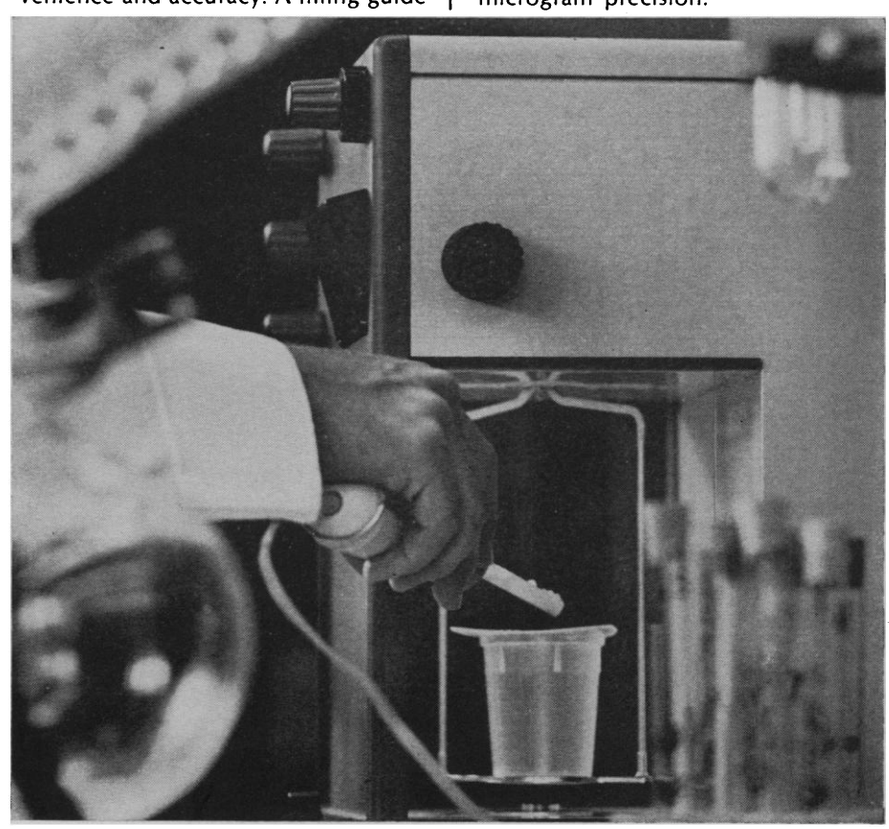

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31 October 1969
Vol. 166, No. 3905

SCIENCE

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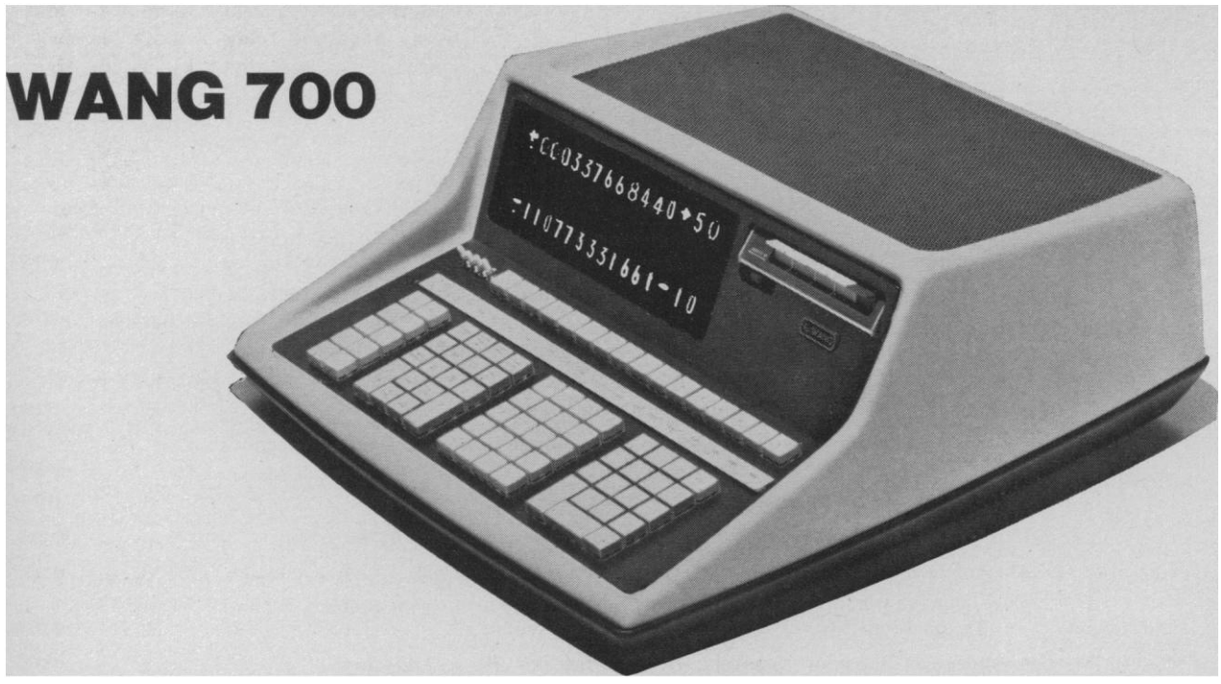
AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE

COVER

Intact brain of a 16-day-old embryo of cockroach *Periplaneta americana* after 2 weeks of culture. Nerve fiber outgrowth and cell migration from the entire brain circumference appear (about × 700). See page 631. [Rita Levi-Montalcini, Washington University, St. Louis, Missouri]



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It may turn out, then, that Europe seems to have good solutions to problems because she hasn't really had the problems. Certainly there are many others in which Europe has lived with the situation longer than we have, and really has the answers. But I suspect we will find fewer of these, and more of the former, than either we or the Europeans expect at the present time.

ALFRED B. MASON
136 Flushing Avenue, New York 11251

Lead Poison in Putty

Oberle's article "Lead poisoning: A preventable childhood disease of the slums" (5 Sept., p. 991) contains some errors of omission. Not only has titanium dioxide been used as an opacifier since the 1940's, but previously zinc sulfide pigments (such as lithopone) were used for a number of years. Kalsomine has also been used for many years for very cheap paint jobs.

However, the most serious omission is the failure to mention the most important lead hazard to all children: old sticks of glazing putty. Anyone who has repainted housing, where windows have been installed in wooden frames, has had to replace defective putty, which is brittle and comes loose from the window, often in sticks 1 to 4 or 5 inches long. This putty contains a high percentage of lead; the dry sticks resemble lollipops or candy bars and children will suck on them or chew them. I think that a thorough study of this problem will show that glazing putty is far more of a hazard than paint as a cause of lead poisoning in children.

ALBERT M. ARONOW
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Sequoias' Dependence on Fire

We were greatly pleased to read Oberle's commentary on the ecological drawbacks of forest suppression (8 Aug., p. 568), and we appreciate your assistance in changing the long-standing American philosophy that all fire in the forest is bad. The concept of fire as a natural environmental factor before the advent of man has been a most difficult one to establish. Perhaps this has been due to man's role in starting forest fires and perhaps to the fact that man has too long been inclined to see trees as individuals rather than as dynamic communities in which fire has always played a significant role.

Inasmuch as we are engaged in a 10-year study of the relationship of fire to sequoia regeneration, some of our findings may be of interest. It became evident that long-time fire prevention and suppression had created two conditions in many of the national park sequoia groves, both of which were contrary to established park policy:

1) Fuels, once consumed by regular fires, had accumulated to unprecedented amounts, presenting uncommonly great fire hazards.

2) Plant succession, which was previously reversed by fire, had progressed in most groves to the point that the giant sequoia was almost completely unsuccessful in reseeding itself. Where protection is complete, there is a tendency for the sequoia to disappear.

We recommended to the National Park Service that fire be used on an experimental basis, primarily to determine just what the optimum conditions for sequoia regeneration were. In March 1964, four study areas were approved by NPS for our use in the Redwood Mountain Grove of Kings Canyon National Park. Few young sequoias were growing on any of the areas. It became abundantly evident that accumulations of fuel on three of the four areas were so great as to preclude broadcast burning. At these areas, it was necessary to pile logs and limbs by machine. In addition to increasing the costs, the machinery greatly disturbed the natural soil conditions we wished to study. We discovered, however, that where light and soil moisture conditions were adequate, seedling establishment tended to be proportional to the intensity of the fire. In short, seedling survival was better in burn pile soils where incineration temperatures penetrated several inches into the soil. Such temperatures probably aided in sterilization against pathogenic fungi, reduced competition with established plants, improved the soil wetability and structure, and may have removed ectocrines. But this created a problem of controlling fires of sufficient intensity to provide conditions for sequoia regeneration while still protecting the primary resources—the parent giant sequoias and other valuable species making up the community.

Recently, the administration of Sequoia and Kings Canyon National Park began a fuel reduction program in one of the critical areas of the Redwood Mountain Grove. Under carefully prescribed

conditions for burning, ground fuels could be reduced effectively and cheaply and, at the same time, create sufficiently hot spots of fire to provide good reseeding conditions for sequoia. This initial plan involves about 35 acres. While this may seem like a modest beginning, it is a beginning and the NPS stands to learn much, both about burning techniques, and the ecology of the giant sequoia.

The NPS is now recognized as one of the leaders in accepting fire as a manipulative tool in land management. While we do not advocate fire as a panacea for forest problems, we do feel that it has useful applications in many situations.

RICHARD J. HARTESVELDT
H. THOMAS HARVEY
HOWARD S. SHELLHAMMER
RONALD E. STECKER
Department of Biological Sciences, San Jose State College, San Jose, California 95114

Comparative Pathology

The Registry of Comparative Pathology has been established at the Armed Forces Institute of Pathology as a part of the American Registry of Pathology. This new registry is operated jointly by the Armed Forces Institute of Pathology and Universities Associated for Research and Education in Pathology. The objective of the center is to serve as an information exchange for scientists interested in the study of animal models of human disease and other aspects of comparative pathobiology. Information will be gathered about primates, domestic animals, such as horses and cattle, zoo animals, laboratory animals, fish, birds, and, to some extent, invertebrates.

A news bulletin will be published, beginning in October 1969, to describe the activities of the Registry of Comparative Pathology. This will be available without charge to scientists throughout the world. Those interested in receiving this bulletin should request it from the Registrar, Registry of Comparative Pathology, Armed Forces Institute of Pathology, Washington, D.C. 20305.

Members of the advisory committee of the Registry of Cooperative Pathology are: Robert W. Wissler, T. C. Jones, Kurt Benirschke, Robert W. Leader, Donald B. Hackel, and Robert W. Squire.

ROBERT W. LEADER
Rockefeller University, New York 10021

31 October 1969, Volume 166, Number 3905

SCIENCE

Energy for Man and Environmental Protection

Recently, the expansion of electric-power-generating capacity has been stopped or delayed at a growing number of points in the United States. These delays are a result of well-intentioned activities that have caused rising public anxiety about the environmental impact of the operation of electric generating stations and, particularly, of atomic generating plants. This concern has solid basis, and in the long run can prove to be socially beneficial.

But concern over environmental effects has now reached a point where those charged with the responsibility of maintaining the needed growth in the energy supply find themselves unable to carry on effectively. Progress on developing hydraulic energy sources is stalled due to concern for the landscape; management is inhibited from constructing fossil-fuel generating plants due to considerations of atmospheric pollution, and in some localities cannot either construct, or operate after construction, atomic energy sources because of concern about the release of radioactive substances to the atmosphere and to water. Another cause for delay is objection to the thermal pollution of the water bodies utilized to condense the exhaust steam. Because of delays in the installation of new generating capacity many major power grids are without comfortable reserves to meet emergencies. And if this opposition to expanding our electric energy supply continues, surely we are going to bring about a catastrophic situation. This we simply must avoid. The implication this carries for our national policy is clear. A major effort is called for to make possible continuing and expanding use of energy by man and to assure compatibility of this energy with a healthy environment.

Three distinct segments of our society need to join in this long-term effort. Foremost is the goevernment of the United States. Through its legislative and executive branches it needs to give leadership in research to evaluate the effects of the polluting phenomena and to develop both remedial devices and alternatives such as new sources of energy (for example, controlled nuclear fusion), new methods of conversion, new methods of shielding, and new safety measures and devices.

The scientific and technological community has a vital role to play. It, above all others, is in a position to appreciate the importance to the future of our society of placing no obstacles in the way of providing adequate energy. And it must rise to the social challenge of achieving, through knowledge enhanced by research, compatibility between expanding use of energy and environmental health.

The managers of the energy-producing industries must assume their share of the heavy burden of responsibility for maintaining a clean environment, but they must do so without sacrificing efficiency, prudent investment, and responsibility for continuity of production. There is no real occasion for panic provided we set about the task with vigor and determination. Neither is there any need to doubt the feasibility of obtaining both increased energy for man and environmental protection. It may be difficult, but the two are, or can be made, compatible.

—PHILLIP SPORN, *Member, National Academy of Sciences and National Academy of Engineering; former President (1947–61) of American Electric Power Co.*

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