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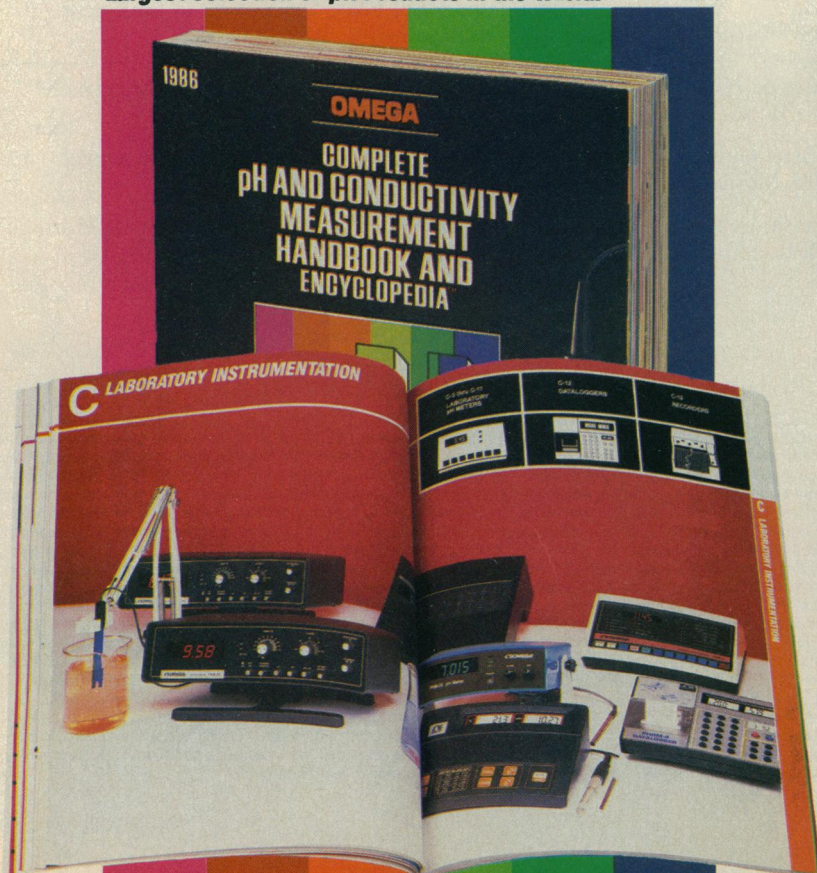


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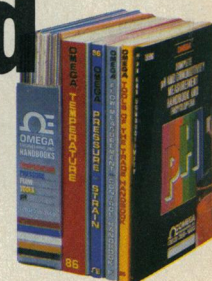


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**COVER** Inhibition of insect juvenile hormone esterase delays metamorphosis resulting in giant larvae up to 15 grams in weight (right), which spend twice as much time feeding in the ultimate instar and consume three times as much food as the smaller animal (left). See page 1073. [M. Philpott, Department of Entomology, University of California, Davis 95616]

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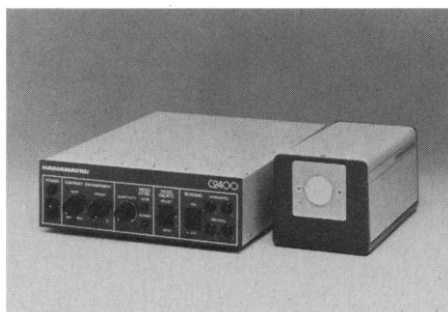


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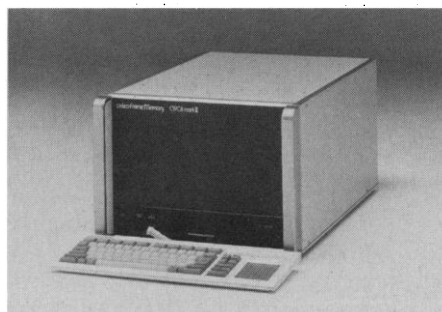
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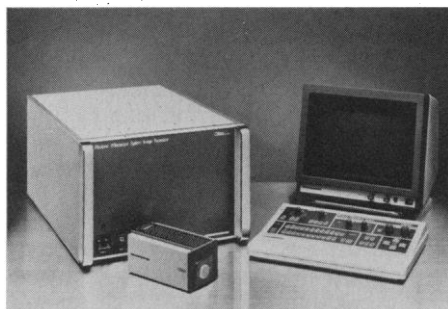
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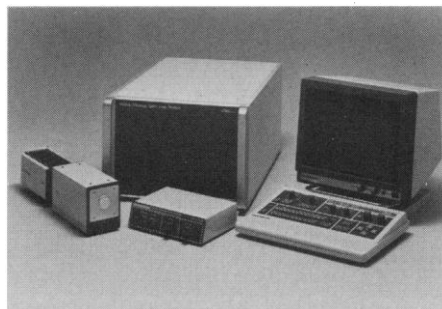
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## This Week in SCIENCE

### Affinity purification of esterase

JUVENILE hormone esterase is an important enzyme in insect (cover) metamorphosis and reproduction (page 1073). It cleaves juvenile hormone (JH), and its anti-JH effect, along with decreased JH biosynthesis, promotes the progression of larvae to pupal and adult stages. Abdel-Aal and Hammock purified the esterase by a new affinity chromatography technique in which esterase inhibitors (transition state analogs) are attached to a matrix material and are available to bind to the esterase's catalytic site. Similar analogs in solution were used to elute the tightly bound enzyme from the column; purification did not destroy enzymatic activity. Studies of JH esterase should provide key information about insect development. Through insertion of the purified enzyme into insects early in their development, JH could be prematurely cleaved, insect development could be disrupted, and pests might be controlled. The technique may be applied to isolations of other enzymes, since transition state analogs are known for all classes of enzymes.

### Growth factor in atherosclerosis

BLOOD vessels are damaged during the development of atherosclerosis, and the injured vascular endothelium does not get properly repaired (page 1078). Platelets arrive quickly at a wound site and release a number of factors, including transforming growth factor-beta (TGF- $\beta$ ), that may contribute to the failure of lesions to heal and the failure of the endothelial integrity to be restored. Heimark *et al.* show that, in culture, purified TGF- $\beta$  slows both the proliferation of endothelial cells and their migration. Its effects on endothelial cells are temporary; once cells advance to a certain stage in their cell cycles, they are no longer responsive to the factor. Since this same factor stimulates smooth muscle proliferation, the transient inhibition of endothelial

cell regeneration may give smooth muscle cells time to fill in the region and help in the formation of lesions.

### Earthquakes and destruction in Mexico

STRONG earthquakes and aftershocks rocked Mexico City in the fall of 1985 killing thousands of people, injuring tens of thousands, and destroying or damaging scores of buildings. The cause of the seismic activities was subduction (movement back into the earth's interior) of the Cocos Plate which collides with the North American Plate beneath Mexico. Because an array of strong motion accelerographs had been positioned to monitor this, the most active subduction thrust fault in the Western Hemisphere, and because additional instruments were placed near the epicenter after the first earthquake, detailed records of the propagation of seismic waves, of the amounts of energy released, and of the ground movements and uplift that occurred are available. Along the coast, rock-dwelling algae and other intertidal organisms (adapted to alternating wet and dry conditions controlled by tidal cycles) died from desiccation, and the extent to which they were disrupted provided an independent measure of the uplift that took place. Building damage was correlated with location in the Mexico City area and with design features. Details of this disaster are described by Anderson *et al.* (page 1043) and Bodin and Klinger (page 1071).

### Constitutional convention

ADVANCEMENT of science in the United States, judged to be among the highest aspirations of the community, was entrusted by the framers of the Constitution to the citizens who chose their universities as the centers for scientific pursuits (page 1056). Freedom to think and speak new and potentially dangerous thoughts was secured for university scientists by the First Amendment and by tenure. At

first, universities were the main funders of science but, later, private foundations and eventually various agencies of the federal government covered the skyrocketing costs. Funding shifted from pure science to mission, goal, and even result-oriented programs, and the universities became contract research centers serving the federal government. Piel argues that the constitutional contract has eroded and urges that sovereignty over the advancement of science be returned to the citizens and that the seat of that sovereignty be returned to the universities. If funds were allocated to universities and university scientists were permitted to determine appropriate research in the public interest, and if the legislative (not executive) branch of the federal government were the source of the funds, the original social contract between science and the citizen could be resumed, the potential of science might be better met, and basic objective knowledge might again increase exponentially.

### AIDS virus in brain cells

MACROPHAGES in brains of AIDS patients carry the genetic material of the AIDS virus and are sites for viral replication (page 1089). More than 75% of AIDS victims show neuropathologic changes at autopsy, and many patients suffer from dementia and other neurologic symptoms. In studies of brain tissues from two patients who had severe encephalopathies and died of AIDS, viral RNA and budding viral particles were associated with mononucleated and multinucleated macrophages and not with other cells in the brain (including lymphocytes for which the virus has a strong tropism). Koenig *et al.* suggest that blood monocytes infected with the AIDS virus may cross the blood-brain barrier and differentiate into macrophages in the brain. The brain pathology that then ensues might be a consequence of the viral infection itself, of macrophage (or other cellular) activities, of secreted products, or of immune reactions to cells or products.



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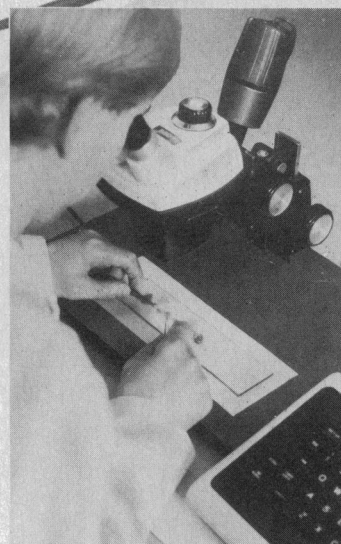
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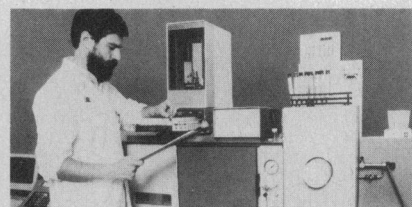
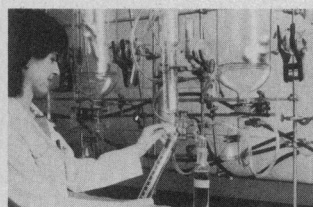
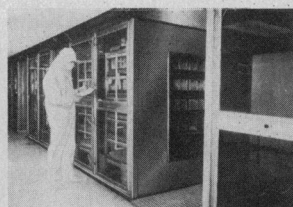
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## Beauty, Balance, and Mathematics

Now that female beauty has been reduced to a formula (eye width, three-tenths of the width of the face; chin length, one-fifth of the height of the face; area of the nose, less than 5 percent of the area of the face\*), we await the arrival of a formula for the ideal journal. The reader might wonder how decisions can be made in the absence of such mathematical precision. There are indeed historical, philosophical, and economic considerations that guide the policy of a journal.

*Science* is designed for the sophisticated scientist. Why sophisticated? Because, of course, like beauty, interest in a journal is in the eye of the beholder. *Science* is a relatively thin magazine compared to most specialty journals, yet it covers the entire range of scientific disciplines. Thus it is inevitable that only a small fraction of the articles can be in an individual scientist's subdiscipline. The more curious the reader is about the entire range of science, the more likely he or she is to find something of interest in our pages.

A frequent comment is that *Science* is biased toward the biological sciences. That is historically true, and Newton's laws of motion apply to magazines as they do to bodies falling through space: to change trajectories requires enormous force. It is the goal of this magazine, of this editor, and of the American Association for the Advancement of Science, which represents all of science, to increase participation of scientists in nonbiological disciplines. To do this at the expense of biological science at a time when biology is flourishing in what appears to be its golden age would be folly. Therefore, the AAAS has wisely decided to add pages to the magazine in order to increase the participation of the physical and social sciences without diminishing the contributions of biological sciences.

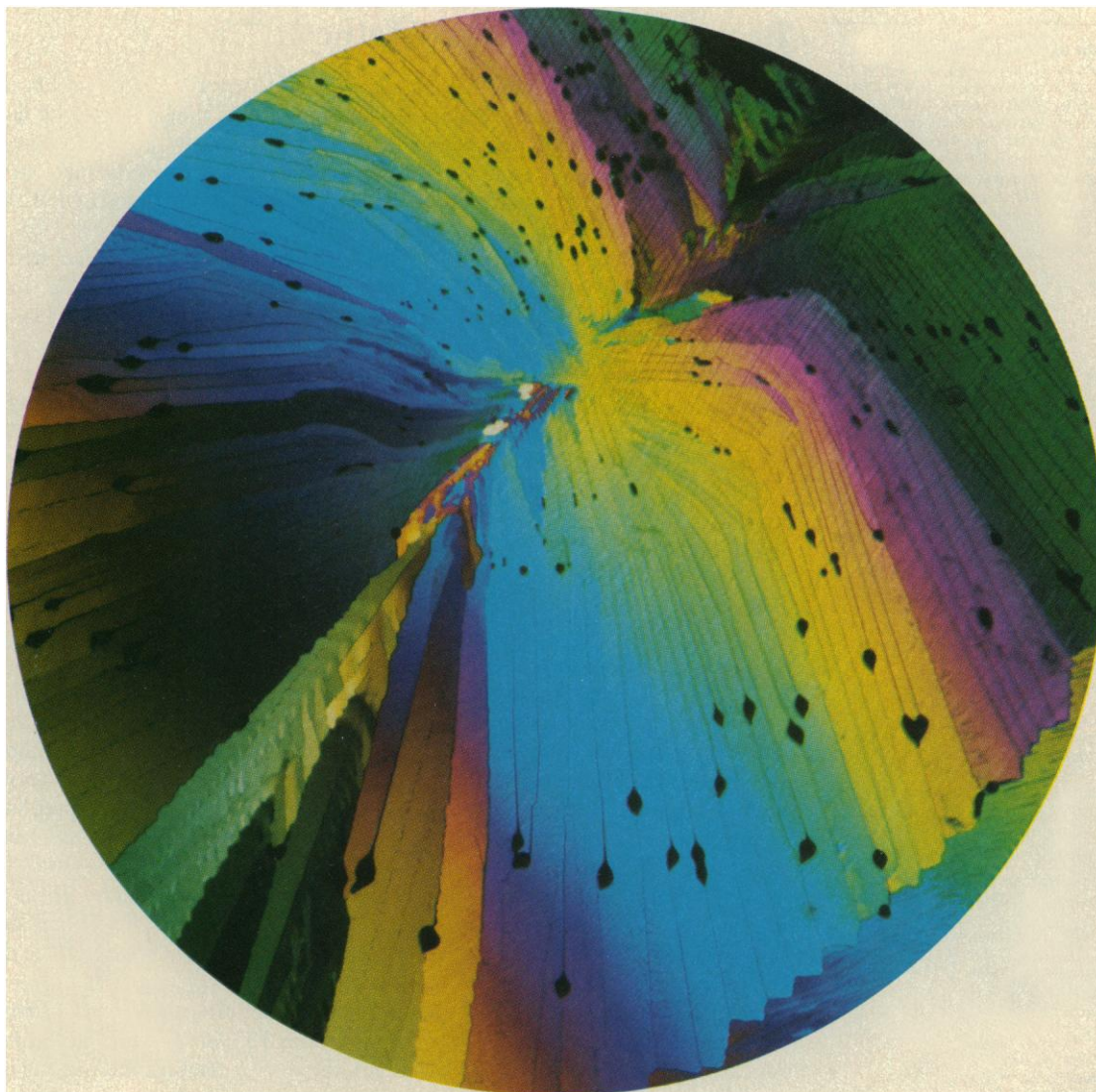
Balance does not mean that each part of the magazine in each issue will have the same proportion of space for the various fields. Our news department emphasizes the physical sciences, as space science and weaponry occupy an unusually large portion of the news. Reports emphasize biology. Solicited articles, Research News, and Book Reviews reflect our attempts to increase coverage of social and physical sciences. We interpret balance in terms of the entire magazine, and our goal is to ensure that each issue contains items of interest to every type of scientist.

Balance is not achieved by giving every subspecialty equal weight. Fields that flourished in the past may not be as productive in the present and "the past" can be a mere few years ago. We do not wish to forget the past, but we want to emphasize the present and the future.

In the selection process, the economics of publication must play a role. For a wide circulation magazine such as *Science* (subscriptions 155,000) compared to specialty journals (circulations in the 3,000 to 10,000 range), the cost of printing and mailing is enormous. If we want to keep the magazine portable, economical, and comprehensive, topics of the widest impact must be given priority. Seminal articles in any area are welcome, even if they may be difficult reading for many. Intense joy to a small minority of our readership can be as important as mild pleasure to the majority of our audience. An author's anguish when we reject an excellent paper with the statement that it is more appropriate for a specialized journal is matched by our own. This painful selection process is not driven by economics alone; it is also a service to our readers to present a distillation of the best and most general.

Magazines, like species, must adapt to optimize their survival in an ever-changing world. Mutations can occur from within or by suggestions from readers, and this editor particularly welcomes ideas for new features, new emphases, and new concepts. Those who think that their particular specialty is being neglected are encouraged to send specific suggestions to us. We would hope that a mathematical formula would arise to select the good mutations, but in the interim the editor's receptors will have to respond in a serendipitous manner to the most attractive intellectual pheromones provided by our writers and scientists.—DANIEL E. KOSHLAND, JR.

\*M. Cunningham, *J. Pers. Soc. Psychol.* 50, 925 (1986).



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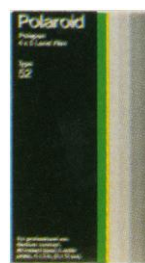
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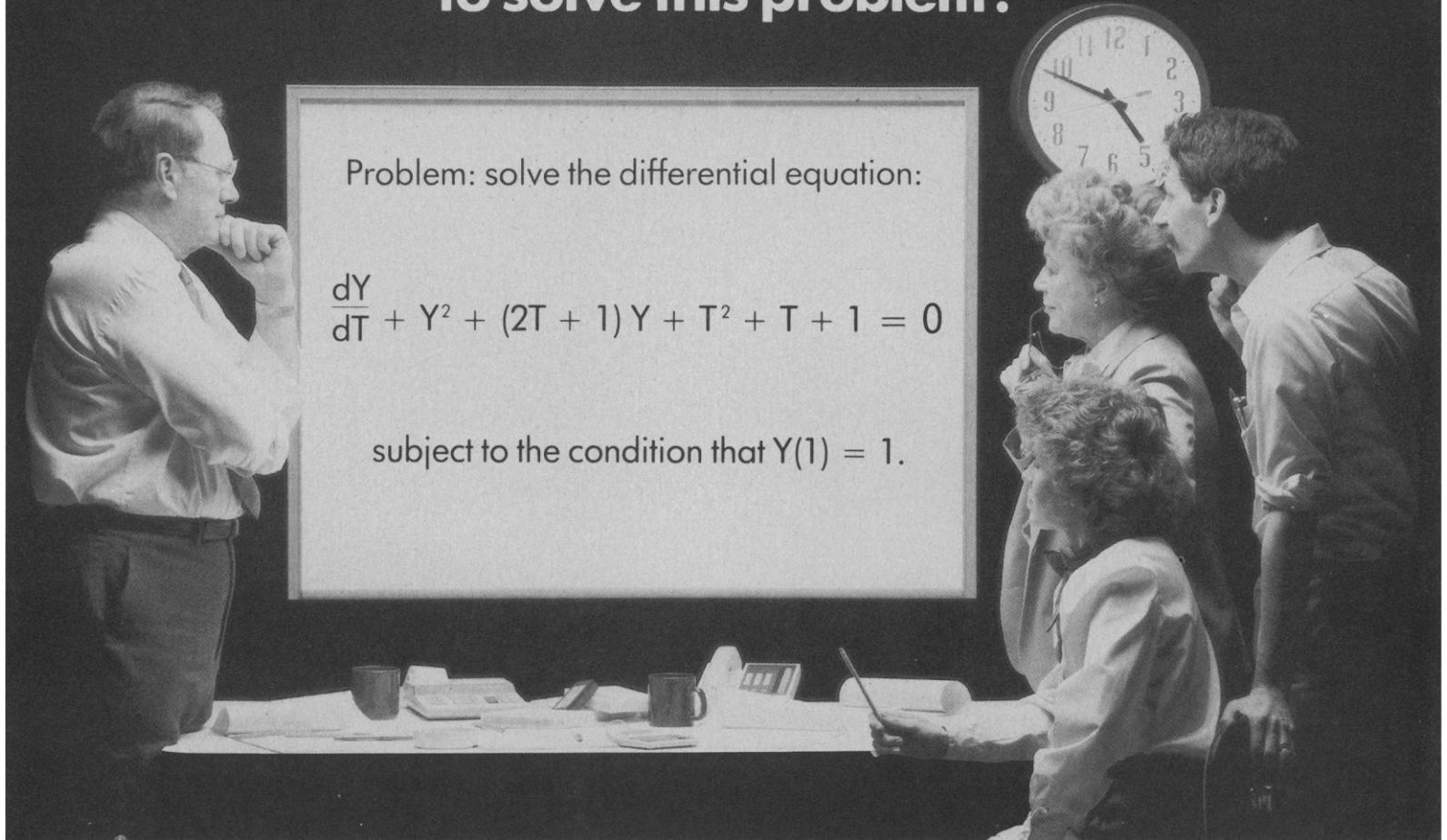
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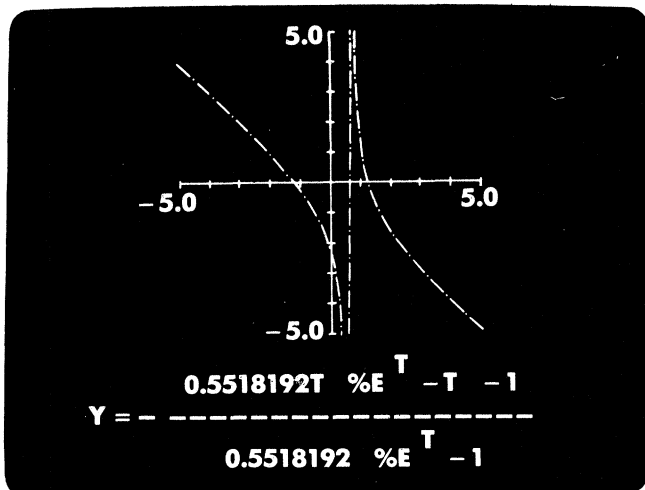
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(D2)  $\frac{dY}{dT} + Y^2 + (2T+1)Y + T^2 + T + 1$ 
(C3) SOLN:ODE(%,Y,T);
(D3)  $Y = -\frac{\%C T \%E^T - T - 1}{\%C \%E^T - 1}$ 
(C4) SUBST([T = 1, Y = 1], %);
(D4)  $1 = -\frac{\%E \%C - 2}{\%E \%C - 1}$ 
(C5) SOLVE(%,%C),NUMER;
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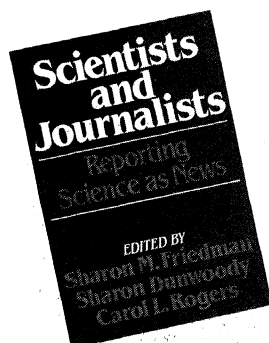
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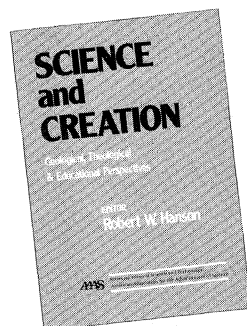


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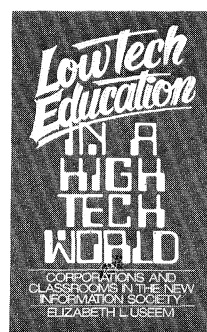


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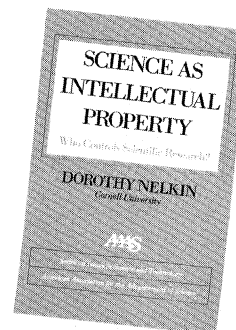


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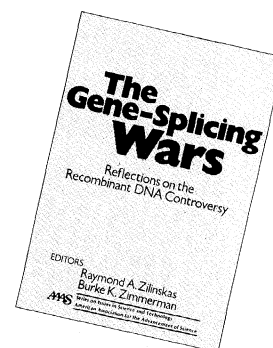


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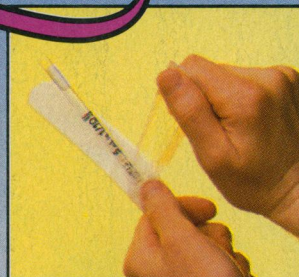
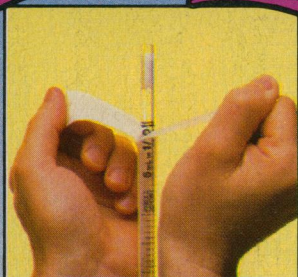
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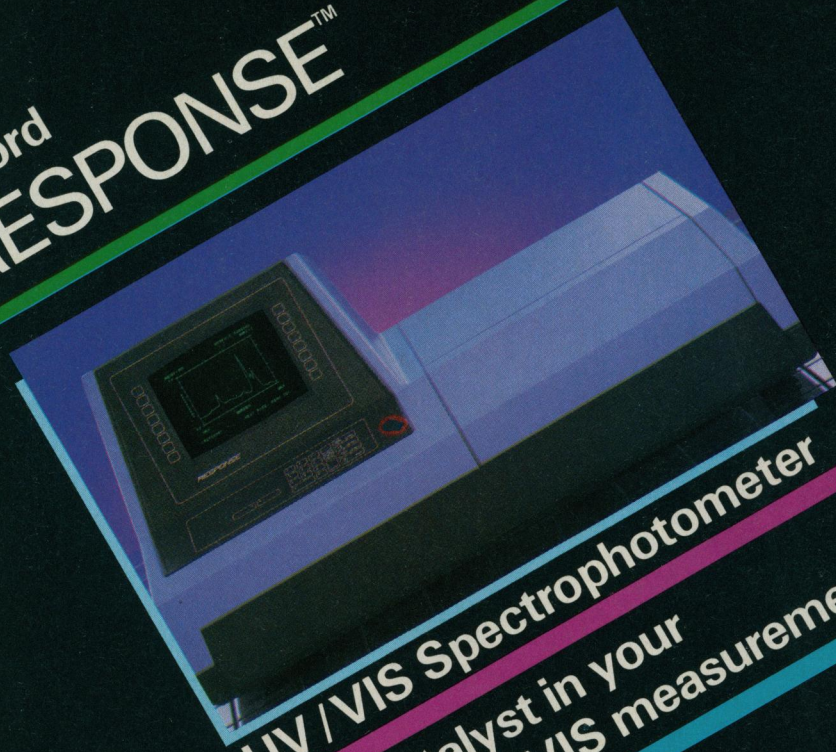
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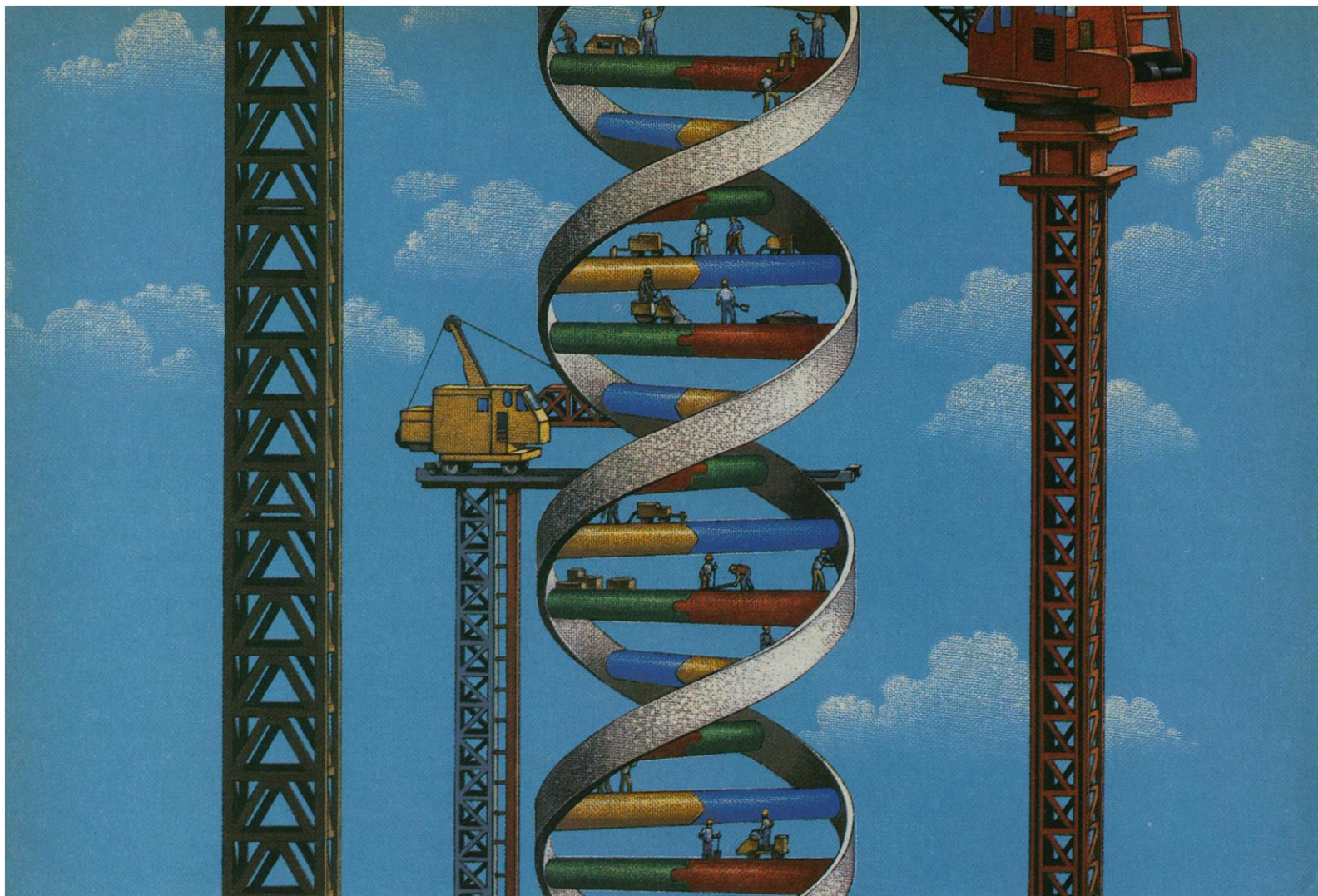
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AAAS initiated its magazine in 1979 with the aim of reaching an adult educated readership with responsible and well-written features and columns designed "to bridge the gap between science and the citizen." The venture proved highly successful from the standpoint of circulation, which grew quickly to more than 700,000. A sensation in the publishing industry, the magazine was selected twice in a row for the coveted National Magazine Award for Excellence in its category. As AAAS turned attention to the endemic problems of precollege science education, the magazine also be-

came an asset to teachers and students.

"Everything worked beautifully," said AAAS Executive Officer William D. Carey, "until advertising sales in 1984 and 1985 went from bad to worse. We never thought to make a profit on the magazine, but after the first year or two of start-up it had to break even." According to Carey, advertising pages sold fell 50 percent from 1983 to 1985 while AAAS's losses mounted, and the first half of 1986 showed a 40 percent shortfall from the same period a year before. "For that matter," notes Carey, "all the general sci-

ence magazines were taking a bad beating on advertising sales, but the others were commercial publishers with resources to fall back upon."

Queried as to why AAAS had accepted an offer from Time Inc., knowing that *Science 86* would be folded into *Discover*, Carey said that the Board of Directors waited for other offers, but although several potential bids were expected to mature, in the end only Time Inc. submitted a firm purchase contract.

"The Board has an inescapable responsibility to protect the Association's assets," Carey said,

"and had it gambled on a white knight riding to the rescue later in the year, it could have had big trouble on its hands."

In purchasing the *Science 86* subscription list and licensing the trademark, Time Inc. submitted an offer approximating \$6 million. In addition, the buyer assumed the responsibility for unfulfilled subscriptions to *Science 86*. Under the terms of the purchase contract, Time Inc. warrants that it "will use its best efforts to maintain in each issue of *Discover* the high level of science journalism which has been recognized in past awards to *Science 86* and *Discover*."

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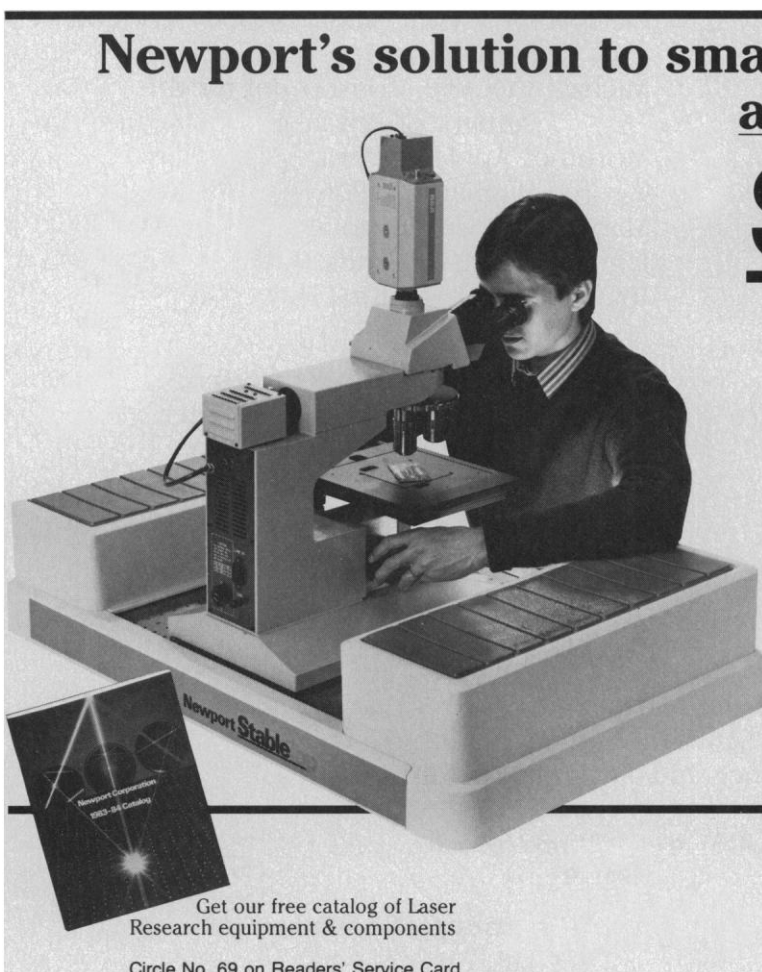
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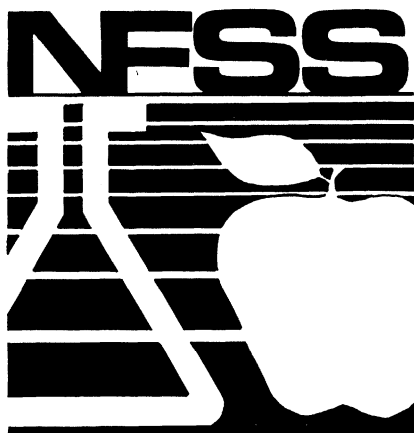
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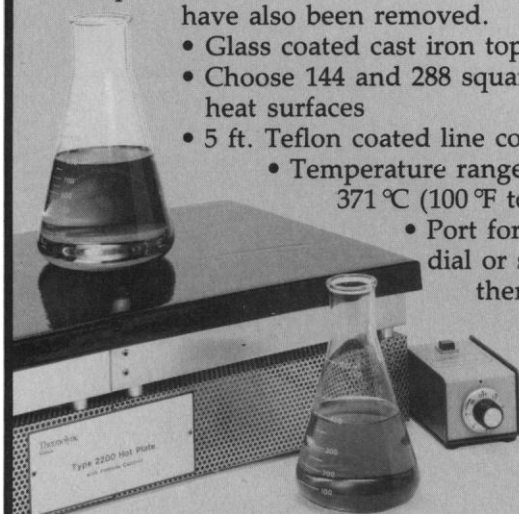
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