American Association for the Advancement of Science

SCIENCE

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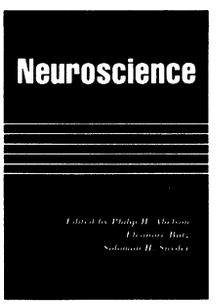

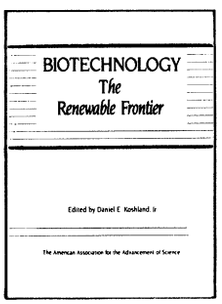

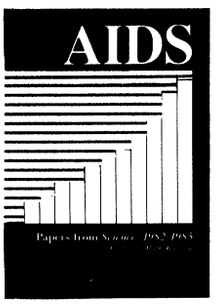

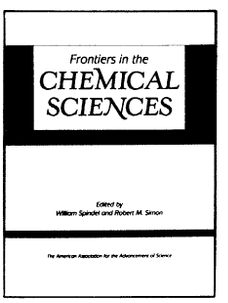

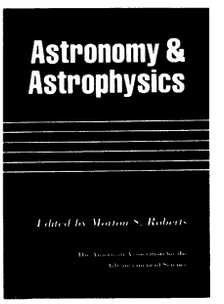

Neuroscience
Edited by Philip H. Abelson, Eleanore Butz, and Solomon H. Snyder
A collection of 27 *Science* articles on neuroscience research — ranging from genetic engineering to clinical therapy. Provides an integrative treatment of brain anatomy, physiology, and chemistry, and addresses fundamental questions concerning nervous system functioning. *1985; 454 pp.; hardcover $29.95 ($23.95 for AAAS members); softcover $14.95 ($11.95 for AAAS members); AAAS Publication #84-13.*

Biotechnology: The Renewable Frontier
Edited by Daniel E. Koshland, Jr.
Covers the latest and most important topics at the forefront of biological research in 26 papers from *Science*. Illustrates the extraordinary cross-disciplinary aspects of modern biology and its tremendous impact on the future. Topics include virology, immunology, developmental biology, cancer, hormones, sensory phenomena, and more. *1986; 384 pp.; hardcover $29.95 ($23.95 for AAAS members); softcover $17.95 ($14.35 for AAAS members); AAAS Publication #85-26.*

AIDS: Papers from *Science*, 1982–1985
Edited by Ruth Kulstad
Presents some of the most frequently cited research papers and news reports on AIDS, published in *Science* between 1982 and 1985. Chronicles how far AIDS research has come and provides an indication of the direction in which it might go. An overview of AIDS research is provided by Myron Essex, chairman of the Department of Cancer Biology, Harvard University School of Public Health. *1986; 654 pp.; hardcover $32.95 ($26.35 for AAAS members); softcover $19.95 ($15.95 for AAAS members); AAAS Publication #85-23.*

Frontiers in the Chemical Sciences
Edited by William Spindel and Robert M. Simon
Describes recent progress in all areas of chemistry, including new work in ultrafast reactions, chemical catalysis, organic synthesis, enzyme mechanisms, theoretical chemistry, analysis, and the chemistry of materials. Compiled from 38 *Science* articles. *1986; 624 pp.; hardcover $29.95 ($23.95 for AAAS members); softcover $17.95 ($14.35 for AAAS members); AAAS Publication #85-10.*

Astronomy & Astrophysics
Edited by Morton S. Roberts
From our own solar system to the pulsars at the very edge of the cosmos, this collection of 24 articles from *Science* reveals a broad, coherent, and contemporary picture of our astronomical universe. Topics include galaxies and cosmology, the solar system, instrumentation, and the structure and content of the galaxy. *1985; 384 pp.; hardcover $29.95 ($23.95 for AAAS members); softcover $17.95 ($14.35 for AAAS members); AAAS Publication #85-4.*

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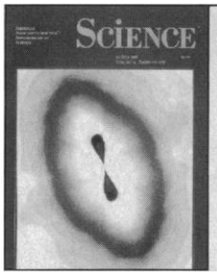
■ The American Association for the Advancement of Science was founded in 1848 and incorporated in 1874. Its objects are to further the work of scientists, to facilitate cooperation among them, to foster scientific freedom and responsibility, to improve the effectiveness of science in the promotion of human welfare, and to increase public understanding and appreciation of the importance and promise of the methods of science in human progress.

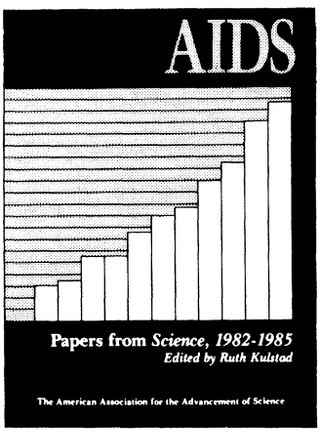


COVER False-color representation of midplane densities in a bar-shaped model of the early solar nebula (the region shown is eight times the earth-sun distance across). Dark colors are high density; white is low. The binary is expected to merge and form a protsun; the planets may have formed in the surrounding nebula. See page 565. [Alan P. Boss, Carnegie Institution of Washington, Washington, DC 20015]

Reports

Technical Comments

Book Reviews



A One-Volume Library of Essential AIDS Research

AIDS: Papers from *Science*, 1982–1985

Edited by Ruth Kulstad

Some of the most frequently cited papers on acquired immune deficiency syndrome (AIDS) that appeared in ***Science*** between August 1982 and September 1985 are included in this volume. Arranged chronologically, these 108 research papers and ***Science*** news reports show how far AIDS research has come and provide an indication of the directions in which it might go. This fully indexed collection is useful not only for the experimental data and conclusions, but also as an excellent source of references to AIDS work in other major journals worldwide.

An overview of research in AIDS to date is provided in the introduction by Dr. Myron Essex, chairman of the Department of Cancer Biology, Harvard University School of Public Health.

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This Week in
SCIENCE

Rx for living

THE evidence continues to mount that people who have regular social contacts are healthier than those who are socially isolated (page 540). House *et al.* review this evidence, discuss models designed to account for the association of longevity and good health with a pattern of relationships with other people, and describe diverse observations that link social relationships with psychological and physiological well-being. Marriage appears to be more "beneficial" to the good health of men than of women; likewise, loss of a spouse is more detrimental to men's well-being than women's. Women on the other hand seem to benefit more from relationships with relatives and friends. It is ironic that just as documentation is at hand suggesting that a lack of social relationships is in fact a "risk factor" (like smoking) for morbidity and mortality, people in the United States are tending increasingly to live alone, remain single longer, and have fewer or no offspring.

Hot early solar nebula

SIMULATIONS show that, in the region where asteroids and the terrestrial planets (Earth, Mars, Venus, and Mercury) presumably formed, the presolar nebula, a flat rotating disk of gas and dust, may have been so hot that temperatures of about 1500 K could have been produced by infalling gases (cover) (page 565). Two models that represent different stages of solar system formation are described by Boss, one in which infalling gases would produce a symmetric inner solar nebula and one in which there is an asymmetry around the central axis. Because the models show that heating to very high temperatures was possible (earlier models predicted temperatures only around 500 K), the source and formation of certain meteoritic features, which show evidence for melting at temperatures of 1500 to 2000 K before cooling, may no longer be problematic for developing solar system models.

Cretaceous tsunami

THE impact of a bolide in the Atlantic Ocean may have engendered a strong tsunami at the end of the Cretaceous period. Evidence for the tsunami is a coarse-grained sandstone bed that punctuates an otherwise fine-grained section of the Texas coast (page 567). The Cretaceous-Tertiary boundary in the vicinity of the Brazos River, which had previously been identified paleontologically and by an iridium anomaly, is just above the sandstone. A study of outcrops and cores by Bourgeois *et al.* suggests that the unusual sandstone could have been deposited rapidly, in about a day, by a tsunami 50 to 100 meters high. Above the coarse sandstone, the mudstone containing abundant iridium (probably fallout from the bolide) was deposited during the succeeding weeks. A 10-kilometer-diameter bolide hitting the ocean 5000 kilometers away (or a closer, smaller bolide) would have been adequate for generating a tsunami of suitable magnitude.

HIV-1 and receptors

NORMAL T cells infected with the AIDS virus, HIV-1, lose their ability to respond to signals sent through their CD3 surface receptors but continue responding normally to signals relayed through CD2 receptors (page 573). Both types of receptors, upon activation by monoclonal antibodies (and, in the case of CD2, by various other substances), initiate a biochemical cascade that resembles the cascade induced by antigen binding: "second messengers" transmit information to the cell's interior. Linette *et al.* report that CD2 and CD3 work independently and suggest that because activation pathways are not completely impaired in cells infected by HIV-1 it may be feasible to restore a cell's immune potential by activating alternative surface receptors. Should effective antiviral therapies become available, it may then be possible to reverse HIV-1–induced immune deficiencies.

Cloning of *oct*-2

A gene that has been named *oct*-2 appears to be expressed almost exclusively in B lymphocytes, the cells that make immunoglobulins (page 577). DNA clones complementary to *oct*-2 messenger RNA were isolated by Staudt *et al.*; the protein product of *oct*-2 appears to be NF-A2, a sequence-specific DNA-binding protein necessary for high level expression of immunoglobulin genes. NF-A2 binds to an octanucleotide on promoters of immunoglobulin genes and, through binding, directs gene transcription. The same octanucleotide is associated with promoters and enhancers of other genes and in cells other than lymphocytes. Thus, some answers may be forthcoming as to what accounts for tissue-specific expression of genes and how widely distributed structures like the octanucleotide effect specific functions at individual sites?

Vacuolar give and take

ONE form of reproduction in yeast cells is accomplished through fusion of two parent cells; later a daughter cell buds from the zygote. When a *Saccharomyces cerevisiae* bud is about 10% the volume of the zygote, a vacuole can be detected in it (page 589). This vacuole forms quickly, combining materials of parental vacuoles that up to that time had not mixed with each other. Weisman and Wickner describe tracks in the zygote connecting bud vacuoles with those in the main body and propose that vesicles transport substances between bud and zygote vacuoles. This is a newly identified mechanism for material exchange between vacuoles, and it may have correlates in mammalian cells; yeast and mammalian cells have other forms of vesicular traffic in common.

The bottom lines

Does HIV cause AIDS? The question is debated on page 514.

CALL FOR PAPERS

AAAS ANNUAL MEETING

(together with the AAPT/APS Joint Annual Meeting)

14–19 January 1989
San Francisco Hilton

Share your research with your colleagues across the scientific community at the world's most prestigious general science forum.

You are invited to submit abstracts for contributed paper sessions at the 155th National Meeting of the American Association for the Advancement of Science. Appropriate topics span the physical, life, and behavioral and social sciences. If your abstract is accepted, you will have the opportunity to present your work to fellow meeting registrants, to gain visibility in your field, and to contribute to the overall advancement of scientific inquiry.

The AAAS Annual Meeting will be attended by more than 5,000 of your colleagues representing a full range of scientific disciplines. In addition, the meeting is being held concurrently with the Joint Annual Meeting of the American Association of Physics Teachers and the American Physical Society, registrants of which will also have access to the AAAS Annual Meeting.

Each contributor will be assigned to a poster session and will be provided with a 4′ × 6′ bulletin board on which to display large, easy-to-read text and graphics for approximately 1½ hours so that the work can be discussed with interested parties. In addition, the contributor's abstract will be published and distributed to all meeting registrants.

Instructions:

The privilege of submitting a contributed paper is open **only** to AAAS members and fellows. Although the member/fellow need not be one of the authors, his or her endorsement is required.

Type the abstract on plain white paper. The main body of the abstract must fit within a 5″ square and should be indented, spaced, capitalized, and underlined as in the example at right. Use a typewriter or letter-quality printer. Do not double-space text. Use reproducible black ink for all hand-lettering. Do not draw a box around the abstract or cut and paste it onto another piece of paper.

Above the 5″ square, indicate which broad discipline encompasses your subject, and provide up to three index words that specifically describe the area within that discipline. Below and to the left of the square, type the full name, address, and telephone number of the person to be contacted regarding scheduling, etc. Below and to the right, include the name, affiliation, and signature of the AAAS member or fellow endorsing the abstract.

Send the original plus one copy of the abstract no later than 1 November to **Contributed Papers, AAAS Meetings Office, 1333 H Street, NW, Washington, DC 20005.**

Fees: Presenters must be registered for the AAAS Annual Meeting. Members may register for the full 5-day conference ($75 in advance or $100 on-site) or for just the day of their presentation ($50 on-site); there are also substantial discounts for students. Advance registration information will be sent to all applicants in September.

DEADLINE: 1 November 1988

Example:

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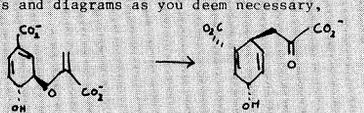

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AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE

SCIENCE

29 JULY 1988
VOLUME 241
NUMBER 4865

The Science Vote in Iowa

Make this the year that no candidate for political office gets elected without being asked what his or her position is on matters relating to science and technology. For too long politicians have been able to get elected without knowing much about or taking an informed position on subjects of importance to scientists, engineers, and society at large. Adequate support of a vigorous program of research and development is one of the few ways that Congress can authorize investments likely to be of enduring benefit to this and future generations. Such expenditures have the potential for improving health, increasing the standard of living, restoring international competitiveness, enhancing our defense, and maintaining this country's prestige as a leader in research and innovation.

There is considerable discussion regarding the need to establish priorities for the expenditure of federal funds for science and technology within a zero-sum game. It is possible, but difficult, to do the job of establishing priorities so that only the highest quality basic research and most appropriate technology development efforts are undertaken. This, however, is only a small part of the problem. The main problem is that the competition for federal funding is getting tougher and the discretionary part of the budget has not been growing. Thus, it is really a negative-sum game, and scientists and engineers are not doing much to change it.

Given this situation, it is remarkable that President Reagan committed all of his 1989 available discretionary budget of more than $3 billion to science and technology activities. But did the scientific and engineering communities congratulate the President on this unprecedented commitment to science and technology? No. Rather, some seem more concerned that if the activities proposed in the President's budget were funded, then the funds available for other areas of research or development might be reduced. This concern has resulted in some intra- and interfield controversy that has only made it easier to move these funds to nontechnical domestic programs. Whether a united front by scientists and engineers to support the President's budget would have prevented Congress from moving these funds out of science and technology programs is now merely speculation.

You might have noticed that you did not hear too much about the science vote in Iowa during the primary campaign. One reason is that the candidates were not asked about science and technology matters. They were not asked how they would address the problems of the effects of carbon dioxide or other so-called greenhouse gases on possible global warming, or what plans they might have to do something about it. They were not asked about individual investigator research, the Strategic Defense Initiative, building the Superconducting Super Collider, the space station, genetic engineering, or science and technology education. It does not matter whether or not you agree with my position on the importance of the items that I listed as budget priorities, or whether you share my belief regarding the importance of science and technology as principal engines of our economy. It does matter that it is possible for politicians to get elected without being informed about critical issues in science and technology.

To remedy this situation, more of you should start going to political functions and asking those seeking election what their position is on those scientific or technical matters that concern you. If the candidates do not have answers that satisfy you, offer to work with them or their staffs to help them develop positions that are based on fact and not on misinformation. You have a responsibility to see to it that your own political biases do not lead you into misleading the candidate on matters of fact. This will only hurt in the long run. One potential dividend of increased political activism on the part of scientists and engineers could be that among the politicians that you work with there might emerge a representative, a senator, a governor, or even President. In that case, there is a good chance that the elected official would then turn to a trusted adviser, who also just happens to be a scientist or engineer.—ALVIN W. TRIVELPIECE