American Association for the Advancement of Science

# SCIENCE

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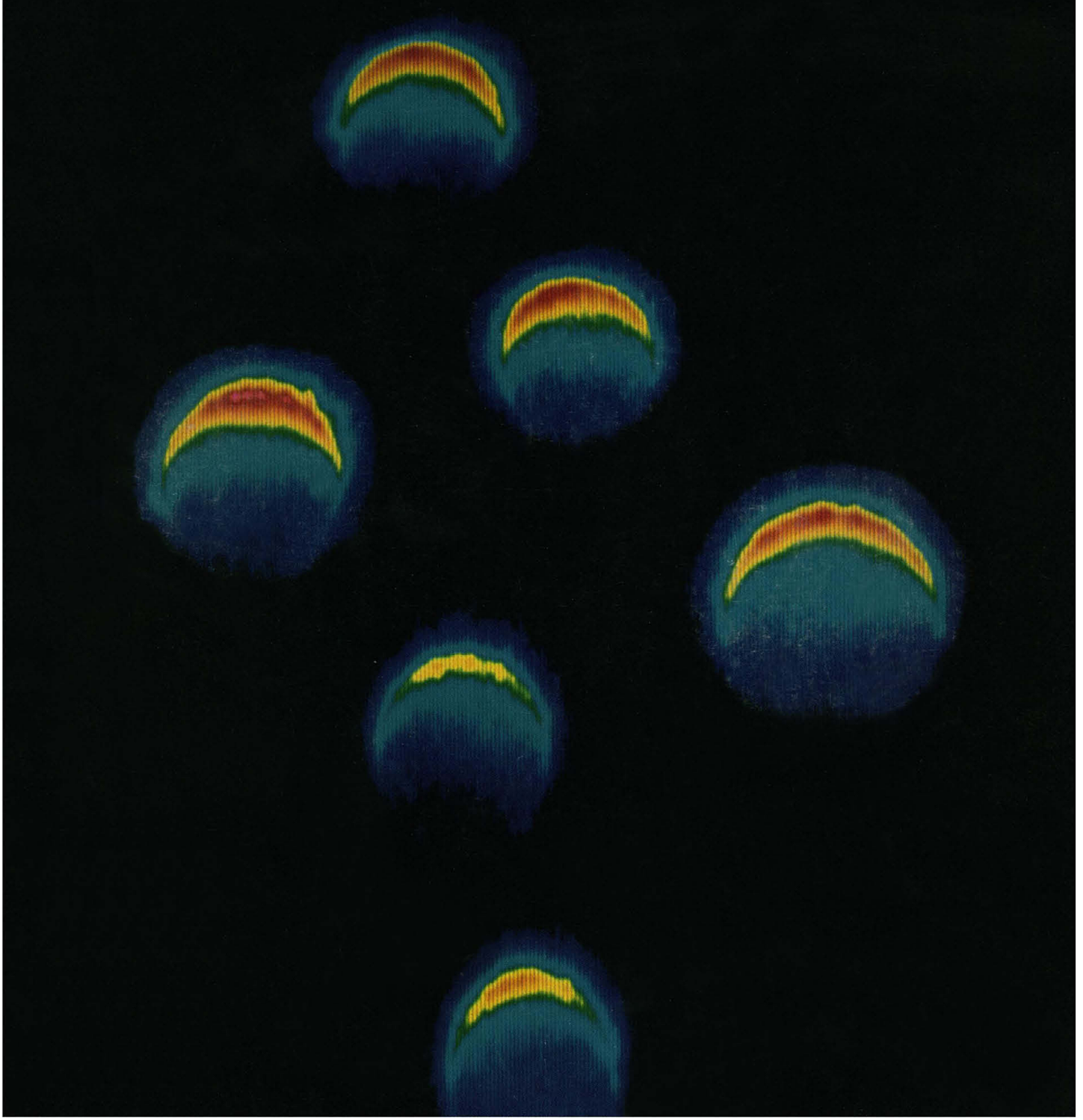

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COVER Molecular crowding on the living cell surface is revealed by the redistributions of fluorescence-labeled surface proteins in electrical potential gradients. This pseudocolor digital image shows induced asymmetric concentration profiles of fluorescein-labeled immunoglobulin E receptors on rat basophilic leukemia cell surfaces. Strongly enhanced thermodynamic activities of cell surface proteins even at normal concentrations were found by quantitative analysis of these images. See page 61. [T. A. Ryan, J. Meyers, B. Baird, and W. W. Webb, Cornell University, Ithaca, NY 14853]

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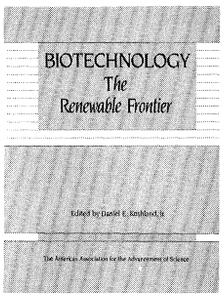


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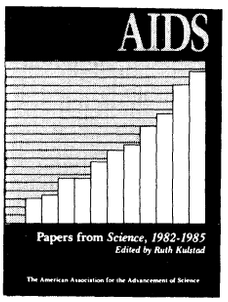


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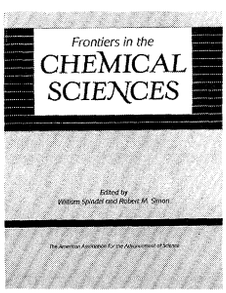


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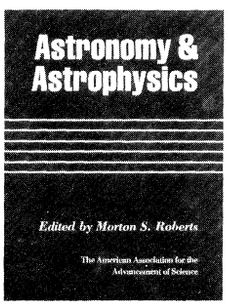


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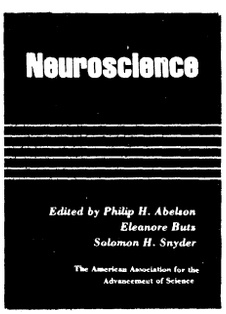


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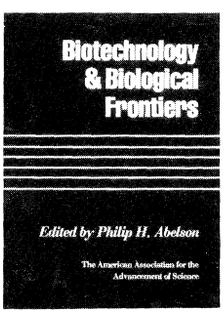


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## Around Lake Turkana

LAKE Turkana sediments have yielded important anthropologic specimens of early hominids (*Homo erectus* and *Australopithecus boisei*) and other mammals (page 27). The composition of sediments and the biostratigraphy of the Nachukui Formation (ranging in age from 0.7 to 4.3 million years old) west of this Kenyan lake are described by Harris *et al.* and compared with previously described formations east (Koobi Fora Formation) and north (Shungura Formation) of the lake. More than 1000 mammalian fossils of 93 species have been recovered from the Nachukui Formation. The study documents faunal successions for many mammalian lines during portions of the Pliocene and Pleistocene epochs. Drainage patterns in the Pliocene and Pleistocene were similar but not identical to contemporary patterns; a major tectonic uplift modified the drainage patterns 1.7 to 2.5 million years ago. The region appears to have been cooler and more humid then than now. These data shed further light on the local environments in which evolution of hominids and other mammals was taking place during the Pliocene and Pleistocene.

## Ozone depletion around the globe

ATMOSPHERIC ozone has been depleted not only over Antarctica (the Antarctic ozone hole) but globally (page 48). The Total Ozone Mapping Spectrometer aboard the Nimbus 7 satellite measured ozone in the atmosphere above sunlit portions of the globe; maps constructed from these daily measurements show that between 1979 and 1986 ozone declined globally about 5%. Ozone loss has varied with latitude: in the tropics depletion has been minimal (about 0.5 to 1% loss annually) whereas outside the tropics loss has increased with increasing latitude; the most sizable losses have been recorded at the poles. Ozone depletion in the Southern Hemisphere has been greater than the depletion in the Northern Hemisphere, a difference that Bowman suggests may reflect the differences in the atmospheric circulations of the two hemispheres. Seasonal variations such as those characterizing the Antarctic ozone hole—the hole is largest during Antarctic springtime—are not striking elsewhere. Recent measurements hint at a slight recovery of ozone levels, but additional measurements will be needed to establish whether the reversal is episodic or lasting.

## Gum disease

BURSTS of activity of the bacterium *Bacteroides gingivalis* can account for the progression of adult periodontitis, an extremely common gum disease in which bone and connective tissue supporting the teeth are destroyed (page 55). *Bacteroides gingivalis* and hundreds of other bacteria are regularly found at sites of periodontitis, but a causal role for them in periodontitis has been difficult to establish. Holt *et al.* implanted *Bacteroides gingivalis* in gums of cynomolgus monkeys (*Macaca fascicularis*) already experiencing plaque, calculus, and gingivitis but free of *Bacteroides gingivalis* infections. Later, these bacteria were isolated from diseased areas of the gums (where bone destruction had occurred) and high levels of antibody to the bacteria were detected in the blood of monkeys with periodontitis. Vaccines against these organisms or therapies against *Bacteroides gingivalis* infections may prove effective in preventing or containing periodontal disease.

## AIDS antibodies in a laboratory worker

A laboratory worker has developed antibodies to the strain of HIV-1 (the AIDS virus) with which the person works (page 68). The individual recalled no incidence of an accidental needle stick or direct contact with the virus through broken skin. The long-term daily association of this worker with samples of concentrated virus (290 days when the first positive blood sample was obtained) apparently afforded an opportunity for the virus to induce serum antibodies; it is possible that, as in cases of laboratory-acquired hepatitis B infections, this worker had inapparent skin exposure to HIV-1. Weiss *et al.* review epidemiologic, serologic, virologic, and molecular facts of this case which surfaced in a prospective study of 265 laboratory workers. The risk for a laboratory worker working with concentrated virus to develop antibodies to HIV-1 remains low; it is similar to the risk for a health care worker who has been stuck with a needle or has had other direct exposure to contaminated blood or equipment. Strict adherence to safety precautions prescribed for working with pathogens is crucial to the minimization of work-related infections for such workers.

## Natural antihormone

NATURALLY occurring antihormones may interfere with normal reproductive functioning (page 72). An antihormone "looks like" its hormone analog immunologically, can be inhibited by antibodies to the hormone, and can presumably bind to hormone receptors, but it does not have the biological activity characteristic of the hormone. Thus the effect of having antihormone in the circulation is to diminish net hormone activity. Dahl *et al.* describe the induction in hypogonadal women of antihormones of the follicle-stimulating hormone (FSH), a glycoprotein whose activity is crucial for reproduction. The FSH antihormones were induced with a gonadotropin-releasing hormone antagonist. Antihormone molecules were found circulating, and, in in vitro assays, they lacked normal bioactivity but had the immunologic properties of active FSH molecules. These and related antihormones may be useful clinically as contraceptives; alternatively, antibodies or hormones that inhibit the antihormones may be helpful in reversing some dysfunctions of the reproductive system.

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# A New Threat to World Health

The Third World is the place in which 75% of the world's population resides, where 86% of all babies are born, and where 98% of all infant and childhood deaths occur. For 1.1 billion people in the 40 poorest countries, it is shocking to realize that life expectancy at birth is but 46 years, mortality under 5 years is 22%, access to clean water in rural areas is 15%, and 31% of the children suffer from malnutrition. Per capita income averages $310 per year. As of 1982, 0.5% of the children became lame from polio, 1% died from neonatal tetanus, 2% succumbed to whopping cough, 3% died from measles, and ten kids died of vaccine preventable illness every minute.

The agency that has the greatest impact on the health and quality of life of the people in the developing countries is, in most cases, the World Health Organization. WHO established the Expanded Program for Immunization which has increased the number of children vaccinated against the six major killing and disabling childhood diseases from 5% to almost 50% in the past decade and is committed to making it accessible to all children in the world by 1990. It set up a Program on Diarrhoeal Disease Control to prevent the needless death of 4.5 million children a year worldwide. It is the center of information on maternal and child health. And at the Venice Summit, our President and the leaders of the major industrialized nations asked WHO to serve as the major coordinating and promoting agency for research on AIDS. WHO has formulated a Global Strategy for Health for All by the Year 2000, based on the principle that health is a powerful lever for socioeconomic development (and political stability as well). And precisely 10 years ago, WHO brought about the eradication of smallpox, saving innumerable lives (and the United States $110 million per year in vaccination costs alone). Today and in the future, international travel will help speed the spread of disease among all countries. We will serve both ourselves and others if we provide our share of support to WHO.

WHO is suffering the worst crisis in its history, and ironically we are the cause. Without reason or notice the U.S. government has unilaterally and arbitrarily refused to pay its assessment. We are $118 million in arrears for 1986–87. That respresents a cut of almost 25% in an annual budget that has had zero real growth for 6 years. No organization can function with an unplanned reduction in budget of that magnitude, and drastic cuts in its programs and skilled personnel are now being made.

WHO was caught by the Kassebaum amendment directed at punishing the United Nations' system because "the U.N. and its specialized agencies, which are financed through assessed contributions of member states, have not paid sufficient attention in the development of their budgets to the views of the member governments who are major financial contributors to those budgets." For WHO this is tragic because the objection simply does not pertain. WHO has its own budget process independent of the U.N.'s, and U.S. government representatives have repeatedly acknowledged that its views have invariably been fully taken into account in the budgetary process. Curiously, the United States since 1981 has praised WHO's efficiency and voted in support of the WHO budget. Yet we do not pay our assessment. Now, WHO is caught in the Gramm-Rudman budget constraints and is unlikely to receive its past or future U.S. assessments.

WHO was created in 1948 by an international treaty that was ratified by the U.S. Senate. Thus the failure of the United States to pay its assessment constitutes a violation of a treaty obligation. The response of the American people to the past African famine indicates that we are among the most generous of people and committed to trying to improve the lives of the poorest of the earth. And my experience in Ethiopia and elsewhere indicates that, independent of their form of government, people everywhere know and appreciate that. They will be tragically disillusioned when explanations are forthcoming for cutbacks in WHO programs in health that directly affect their lives. WHO is a unique institution whose work improves the lives of all of us, but particularly those in the Third World. On grounds of quality and importance it deserves the full funding of the U.S. assessment.—BARRY R. BLOOM, *Chairman of the Department of Microbiology and Immunology, Albert Einstein College of Medicine, Bronx, New York 10461*, and *Chairman of the Committee on the Immunology of Tuberculosis, Special Programme for Vaccine Development, World Health Organization*

# Call for Symposium Proposals

## 1989 AAAS Annual Meeting ✦ San Francisco ✦ 15–20 January

Please return this form no later than 15 March 1988 to:
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**Please attach synopsis of objectives of proposed symposium (approximately 200 words).**

**Instructions:** AAAS members are invited to submit symposium proposals for the next Annual Meeting in San Francisco, 15–20 January 1989. Please complete the form above, attach a "Synopsis of Objectives" (about 200 words), and send it to us **not later than 15 March 1988.**

We are particularly interested in symposia presenting the latest developments in science and engineering, as well as the implications of these developments for society. Contributed paper sessions coordinated with symposia are also welcome; inquire for details with this submission.

All symposium proposals are subject to review. If the information submitted is inadequate for review, the proposal will be returned. Endorsement (sponsorship) by an AAAS Section Committee expedites the review process. It is therefore in the interest of the proposer to **send a *copy*** of the proposal to the appropriate Section Secretary (for names see "AAAS News" section in *Science,* first issue each month) for endorsement at the same time the **original** proposal is sent to the AAAS Meetings Office.

Speakers should **not** be confirmed at this time; however, sufficient information about probable speakers and their topics should be provided to allow for evaluation of the proposal. Please note that AAAS does not pay honoraria to speakers.

**Some Deadlines:** **May** — You will be notified about the acceptability of your proposal. **June** — Preliminary programs with confirmed speakers are due. **August** — Final program copy, suitable for publication, is due.