

819 This Week in *Science*

## Editorial

821 National Institutes of Health: The Centennial Year

## Letters

823 Anthropology and Advocacy: R. A. RUBINSTEIN ■ The Largest Galaxy: H. ARP; S. M. SIMKIN AND J. VAN GORKOM ■ Reference Manager: E. BEUTLER

## News & Comment

- 838 Experts Fault Leadership on AIDS  
Researcher Flouts Gene-Splicing Rules
- 839 Census a Public Burden?
- 840 *Briefing*: Science Diplomats Get Career Boost ■ U.K. Company to Buy Biogen Lab  
■ Pressure to Construct SSC Builds in House ■ Promoting International Studies ■  
Recombinant Organisms Pose No Special Hazard
- 841 NIH Urged to Forge New Ties to Congress
- 843 Recollections on the War on Cancer
- 844 The NIH Legislators
- 846 Arthritis Institute Tackles Sports
- 847 OMB Stalks the "Burgeoning Growth of Biomedicine"
- 848 Biologics Gain Influence in Expanding NCI Program
- 851 Heart Institute Is Major Player in Clinical Trials

## Research News

- 854 The *fos* Gene as "Master Switch"
- 856 Searching Land and Sea for the Dinosaur Killer

## Articles

- 861 NIH Through the Years
- 865 The National Institutes of Health: Some Critical Years, 1955–1957:  
J. A. SHANNON
- 869 The National Institutes of Health in Its Centennial Year:  
J. B. WYNGAARDEN

## Research Articles

- 874 Multiple Global Regulators Control *HIS4* Transcription in Yeast: K. T. ARNDT,  
C. STYLES, G. R. FINK

## Reports

- 881 Borehole Measurement of the Newtonian Gravitational Constant: A. T. HSUI
- 883 Possible Tornado-Like Tracks on Mars: J. A. GRANT AND P. H. SCHULTZ
- 885 Fish Oil Prevents Insulin Resistance Induced by High-Fat Feeding in Rats:  
L. H. STORLIEN, E. W. KRAEGEN, D. J. CHISHOLM, G. L. FORD, D. G. BRUCE,  
W. S. PASCOE

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**COVER** Bioengineer seated at apparatus for making microelectrodes. This year marks the 100th anniversary of the founding of the National Institutes of Health (NIH). Since its inception, NIH's mission has been to improve the health of the American people. To attain this goal, NIH conducts and supports biomedical research into the causes, prevention, and cure of diseases; supports research training and the development of research resources; and makes use of modern methods to communicate biomedical information. This issue contains articles on NIH's approach to that goal: research, training, and communication. See page 861. [Photo courtesy of National Institutes of Health, Bethesda, MD 20205]

- 888 The *sov* Gene of HIV-1 Is Required for Efficient Virus Transmission in Vitro: A. G. FISHER, B. ENSOLI, L. IVANOFF, M. CHAMBERLAIN, S. PETTEWAY, L. RATNER, R. C. GALLO, F. WONG-STAAAL
- 893 A Parathyroid Hormone-Related Protein Implicated in Malignant Hypercalcemia: Cloning and Expression: L. J. SUVA, G. A. WINSLOW, R. E. H. WETTENHALL, R. G. HAMMONDS, J. M. MOSELEY, H. DIEFENBACH-JAGGER *et al.*
- 896 Does the Release of Potassium from Astrocyte Endfeet Regulate Cerebral Blood Flow?: O. B. PAULSON AND E. A. NEWMAN
- 898 Vein-Cutting Behavior: Insect Counterploy to the Latex Defense of Plants: D. E. DUSOORD AND T. EISNER
- 901 Ouabain Resistance Conferred by Expression of the cDNA for a Murine Na<sup>+</sup>,K<sup>+</sup>-ATPase  $\alpha$  Subunit: R. B. KENT, J. R. EMANUEL, Y. B. NERIAH, R. LEVENSON, D. E. HOUSMAN
- 903 Short Interval Time Measurement by a Parasitoid Wasp: J. M. SCHMIDT AND J. J. B. SMITH
- 905 The Three-Dimensional Structure of Asn<sup>102</sup> Mutant of Trypsin: Role of Asp<sup>102</sup> in Serine Protease Catalysis: S. SPRANG, T. STANDING, R. J. FLETTERICK, R. M. STROUD, J. FINER-MOORE, N.-H. XUONG, R. HAMLIN *et al.*
- 909 The Catalytic Role of the Active Site Aspartic Acid in Serine Proteases: C. S. CRAIK, S. ROCZNIAK, C. LARGMAN, W. J. RUTTER
- 913 Adrenal Medulla Grafts Enhance Recovery of Striatal Dopaminergic Fibers: M. C. BOHN, L. CUPIT, F. MARCIANO, D. M. GASH
- 916 The Maize Transposable Element *D<sub>s</sub>* Is Spliced from RNA: S. R. WESSLER, G. BARAN, M. VARAGONA

## AAAS Meetings

- 919 1988 AAAS Annual Meeting: Call for Contributed Papers

## Book Reviews

- 924 Forging the Atomic Shield, *reviewed by* R. CUFF ■ The Changing Humors of Portsmouth, J. W. LEAVITT ■ Magmatic Processes, R. JEANLOZ ■ Books Received

## Products & Materials

- 926 IBM-Compatible Compact PC ■ Statistical Consulting Software ■ Computer Graphics Display System ■ Kit for Inducing Mutations ■ C-Language Compiler ■ Micromanipulator ■ pH and Ion Meter ■ Literature

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## National Institutes of Health: The Centennial Year

The National Institutes of Health (NIH) today is such a highly differentiated mature organism that it is difficult to visualize its origin as a single cell: a small room in the attic of a building on Staten Island. The Hygienic Laboratory, created from a desire to provide relief for sick and disabled seamen, soon proved its worth after cases of cholera were diagnosed among immigrant passengers on the steamship *Alesia* in the 1880s; shortly thereafter, Joseph Goldberger conducted his landmark study on the prevention and cure of pellagra. Those early events established two of the hallmarks of basic research: surprise (pellagra was thought to be a contagious disease and turned out to be a nutritional problem) and delight (the revelation that very practical things result from basic research). The laboratory was later moved to a building in Washington built for the stupendous sum of \$35,000, and eventually became the National Institutes of Health.

In the 1950s Director James Shannon formed an alliance with Congress that vastly increased support for this mission-oriented sponsor of basic research. That special relation between Congress and NIH has been maintained by subsequent directors, including NIH's present leader, James Wyngaarden. In fact, its relation with Congress is so good that each year we watch a soap opera in which the foul fiend (the Office of Management and Budget) threatens the beautiful damsel (NIH) with a fate worse than death (a budget cut) only to be foiled by her rescue by the heroic knight (Congress).

In this issue of *Science*, NIH directors Shannon and Wyngaarden and several staff reporters look at NIH in its centennial year. In discussion of the many facets of NIH, two major reasons for its success stand out. The first is the sophisticated democracy of its research granting procedures. Like democracy, peer review has plenty of critics, some knowledgeable and some not, who point out its flaws with gusto; like democracy, peer review has emerged triumphant because it is so much better than any of the alternatives. It is a process inevitably identified with the vagaries of human judgment, but nevertheless one that is based on expertise, hard work, and a fundamental integrity. Only loyalty to a higher ideal would drive a competent scientist who supposedly values his or her own time to participate three times a year in reading 106 grant proposals and attending a 3-day meeting for an honorarium of \$300.

The second major reason for the success of NIH is that it has always had a broad vision of its mission. Many forget that NIH has always been a mission-oriented agency, beginning with tending to sick sailors and progressing to advocating the health needs of the general public. An early decision of NIH was to interpret Congress' call for cancer research to be best implemented by a general understanding of growth. If cancer research had been narrowly focused on the direct approach of chemotherapy, we would be far behind our current understanding not only of cancer but also of many other diseases. The study of the basic biology of viruses (because they were hypothesized to be a cause of cancer) led to the serendipitous cure for poliomyelitis. The success of the Salk and Sabin vaccines and the increased study of DNA then led through the genetic code back to oncogenes. The decision to emphasize basic research as the route to a practical goal has vastly improved our understanding of cancer as well as viruses, the genetic diseases, hormonal disorders, and mental illness.

NIH sponsors many programs but its leadership in research and its symbiotic relation with universities to expand the frontiers of knowledge in a sophisticated, fair-minded, and cost-effective way provide the soul to an operation in which all those who participate can be justly proud. Idealism is not enough. If altruistic concepts benevolently administered had produced repeated failures, NIH would have a tiny budget today. Its role in the cure and prevention of disease and its contribution to the expansion of basic scientific knowledge have made NIH one of the most successful enterprises of our government. Because the little laboratory in the attic on Staten Island had a combination of vision and altruism, the present organization cannot claim to have invented those values. What NIH has done, and why it deserves a place in history, is to preserve both creativity and integrity in a vast and expensive bureaucracy, an accomplishment which our daily headlines tell us is not easy to achieve.

—DANIEL E. KOSHLAND, JR.