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Spindle diversity diagram for Heteroptera (true bugs) from 250 million years ago to the present, representing 39 families at its widest extent; a typical heteropteran adult (stink bug) is depicted at the top. Data from the fossil record indicate that modern insect diversity results from low extinction rates rather than high origination rates. See page 310. Insets: early Oligocene insects—from Baltic amber, a scuttle fly (left) and an ant (bottom), and from the Flornissant beds, a March fly (right). [Illustration: Finnegan Marsh]

**RESEARCH ARTICLE**

A Linkage Between DNA Markers on the X Chromosome and Male Sexual Orientation 321


Assessing the Quality of Solution Nuclear Magnetic Resonance Structures by Complete Cross-Validation 328

A. T. Brünger, G. M. Clore, A. M. Gronenborn, R. Saffrich, M. Nilges

Magnetic Field Signatures Near Galileo's Closest Approach to Gaspra 331


Experimental Realization of the Covalent Solid Carbon Nitride 334

C. Niu, Y. Z. Lu, C. M. Lieber

Interlayer Tunneling and Gap Anisotropy in High-Temperature Superconductors 337

S. Chakravarty, A. Sudbø, P. W. Anderson, S. Strong

How Fish Power Swimming 340

L. C. Rome, D. Swank, D. Corda

Formation of Magnetic Single-Domain Magnetite in Ocean Ridge Basalts with Implications for Sea-Floor Magnetism 343

Y.-H. Shau, D. R. Peacor, E. J. Essene

Induction of Apoptosis by the Low-Affinity NGF Receptor 345


Redundant Mechanisms of Calcium-Induced Calcium Release Underlying Calcium Waves During Fertilization of Sea Urchin Eggs 348

A. Galione, A. McDougall, W. B. Busa, N. Willmott, I. Gillot, M. Whitaker

Calcium Mobilization by Dual Receptors During Fertilization of Sea Urchin Eggs 352

H. C. Lee, R. Aarhus, T. F. Walserth

Colocalization of X-Linked Agammaglobulinemia and X-Linked Immunodeficiency Genes 355

J. D. Thomas, P. Siders, C. I. E. Smith, I. Vořechovský, V. Chapman, W. E. Paul

Mutation of Unique Region of Bruton's Tyrosine Kinase in Immunodeficient XID Mice 358


Cellular Mechanisms of a Synchronized Oscillation in the Thalamus 361

M. von Krosigk, T. Bal, D. A. McCormick

**COVER**

**RESEARCH ARTICLE**

**REPORTS**

**AAAS Board of Directors**

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A Scientific Approach to Governing

Science. Dr. Notall, you are one of the great political scientists of all time, the man who engineered Harry Truman’s comeback, the man who wrote Winston Churchill’s speeches, the man who got Arthur elected King of the Round Table.

Notall. A vast understatement of my true worth.

Science. Have you come up with any new ideas on the political scene?

Notall. Of course. I have a brilliant new idea which avoids the vicious dictatorships of the right and the left and the impotence and gridlock of democracy and will solve the problems of automation, diversity, and overpopulation.

Science. And what brilliant new device could possibly do that?

Notall. It is called a “benevolent dictatorship.”

Science. Could anyone ever find a benevolent dictator one could trust?

Notall. I have just spent the weekend at Monticello going into the background and career of Thomas Jefferson, statesman, scientist, diplomat, inventor, activist, revolutionary, and member of the establishment.

Science. What was his attitude toward science?

Notall. He was always a great supporter of science and considered that the three greatest men in the world at the time (whose pictures he hung on the walls of his house) were Newton, Locke, and Bacon. He not only supported science funding but believed science was the mechanism for improving the standard of living, and he was himself an inventor and innovator.

Science. But could he perform the role of a dictator?

Notall. Not only was he able to push most of his proposals through an extremely balky and fractionated legislature, but he founded the University of Virginia, designed its architecture, and then supervised its construction by observing it through a telescope from his plantation. He selected all the initial professors for the university.

Science. Was Jefferson environmentally sound?

Notall. He voluntarily gave up growing tobacco a century ahead of the first surgeon general’s report.

Science. Isn’t there one small problem, namely, that Jefferson is dead?

Notall. Quite the contrary. Today presidents are supported by image-makers, and the candidate’s image turns out to be far more important than what he really does. If you are dead you can’t make mistakes, and your image-makers can develop a consistent reputation without any new changes of mind that would be confusing to the voters and disastrous for legislative success. Most people believe that a secret Machiavellian group is governing any president or prime minister anyway, and therefore it would not be surprising to them that the leader is actually dead instead of just sleeping. Confirmation of their deepest conspiratorial suspicions should make them happy. The minor campaigning disadvantages are easily offset by the fact that there are already busts and statues of Jefferson all over the country, and there is no problem of name recognition.

Science. What was his approach to social security and health care?

Notall. Jefferson was particularly solicitous of his slaves’ welfare, educating them to help increase their skills and providing for security and the best health care that era could offer.

Science. Slaves! How could you even suggest a man who kept slaves.

Notall. Jefferson called the whole system of slavery an “abomination” and worked to abolish it. This type of ambiguity is a political advantage because the public who sees a person on both sides of an issue always assumes the candidate’s heart is on their side, but that his words to the opposition are campaign oratory. Individuals of high principles who stick to one viewpoint rarely get elected.

Science. Dr. Notall, are there any other political devices that you are inventing to strengthen modern leaders?

Notall. I have been looking into (i) “ruling by decree” as an alternative to legislative gridlock, (ii) “divine right of kings” as an alternative to lengthy and costly campaigns, and (iii) “off with their heads” as a more effective way of dealing with the opposition than negative campaigning.

Daniel E. Koshland, Jr.
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Biopesticides

The article “Research community swats grasshopper control trial” by Billy Goodman (News & Comment, 14 May, p. 887) illustrates a flaw in the evaluations of microbial insecticides as alternatives to synthetic chemical pesticides. Although biological pesticides do not create problems such as ground-water contamination and vertebrate toxicity, the ability of biopesticides to replicate and disperse throughout an ecosystem mandates that their potential interactions with nontarget organisms be carefully evaluated.

We feel that Jerry Onsager’s remark that “you either grit your teeth and take chances or spend the rest of your career doing cage studies . . .” is an overstatement of the problem of making such evaluations. Clearly, host range studies of representative nontarget organisms, particularly beneficial invertebrates, could be conducted in reasonable time frames. Their results could then be evaluated by teams of experts in the fields of invertebrate and ecological sciences. Such studies would require far less time and resources than are required currently for the registration of chemical pesticides.

The potential problems of interactions between microbial insecticides and nontarget organisms are particularly important in considering the development of genetically enhanced microbial insecticides such as recombinant baculoviruses. In virtually all invertebrate host range studies with baculoviruses, symptomology has been the basis of assessment. Symptomless infections would have gone undetected. Accordingly, baculovirus infections of nontarget hosts may not have been properly assessed and the ecological consequences of their release not correctly evaluated. With genetically enhanced viral insecticides, inapparent virus infections could become lethal, depending on the properties of the toxins or hormones inserted into the virus to achieve enhanced pesticidal activity.

Whether naturally occurring or recombinant in origin, careful attention should be paid to the potential effects microbial pesticidal insects and nontarget hosts. However, even if host ranges include several nontarget hosts, the benefits of use as compared with alternative control strategies might outweigh the ecological costs.

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Tuberculosis Mortality Decline

Marcia Barinaga’s statement that, “when an antibiotic treatment for tuberculosis (TB) was found in the 1940s, the disease was transformed in the developed world from a lethal plague to a vanished and vanishing illness” (News & Comment, 7 May, p. 750), does not stand up to scrutiny. Deaths from TB were in substantial decline in the West by the latter half of the 19th century, a decline that continued unabated throughout the current century virtually unaffected by the development of chemotherapy in the 1940s or application of the bacille Calmette-Guérin (BCG) vaccine in the 1950s (1). That other infectious diseases were undergoing parallel decreases in deadliness implies that the improved TB survival rate was independent of specific advances in treatment. While a decreased incidence of infection probably contributed to the general decline in infectious disease death rates, other factors were involved as well. Tuberculosis is a case in point. As late as 1940, more than 95% of the population over the age of 45 had a positive tuberculin skin reaction despite an already low TB death rate in that age group (1). The affected population had thus become resistant to the most severe consequences of TB infection. It was this latter development, not the availability of drugs and vaccines, that played the major role in the decline in TB mortality.

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References

Primate Brain Measurements

Many so-called “new” ideas are well-forgotten old ones. We write to comment on Ann Gibbons’ article “Empathy and brain evolution” (News & Comment, 26 Feb., p. 1250) regarding Terrence Deacon’s “bold theory” about how the human brain evolved the unique capability to represent such complex symbols as other people’s
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Breast Cancer Incidence

Eliot Marshall, in his article "Search for a killer: Focus shifts from fat to hormones" (Breast Cancer Research, 29 Jan., p. 618), quotes a National Cancer Institute (NCI) biostatistician as concluding that "about
three-quarters of the [4% annual] rise [in breast cancer incidence] in the 1980s was due to the expanding use of mammography machines. The issue has, however, been studied directly, and the data tell a different story.

The acceleration in the rate of increase of breast cancer incidence evident in the 1980s was analyzed in two studies (1, 2), in which the medical records or tumor registry abstracts of population samples were reviewed. Liff et al. (1) found an increase in breast cancer incidence of 29% among whites and 41% among blacks between 1979 and 1986 in their analysis of SEER (surveillance, epidemiology, and end results) data from Atlanta. After reviewing the registry records of 200 patients, Liff et al. concluded that "mammographic detection of asymptomatic lesions accounted for only 20–40 percent of rising incidence among whites and only 13–25 percent among blacks."

Glass and Hoover (2), in analyzing the population-based tumor registry of Kaiser Permanente, found that "the overall age-adjusted rate of invasive [emphasis added] breast cancer rose 45% . . . in the period between 1960–1964 and 1980–1985" with "the greatest rise . . . in women 60 years of age or older (74%)." After reviewing the medical records of 1745 patients with invasive breast cancer, they concluded that "even under some extreme assumptions, these cases [detected by mammography] could only have accounted for less than one-third of the increase seen from the mid-1970s to the mid-1980s."

To my knowledge, there are no data that contradict these findings. The 4% annual rise in the incidence of invasive or symptomatic breast cancer cannot be explained away by the increasing prevalence of screening mammography. The true cause(s) of this rise must be found.

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References

Cold Fusion Difficulty

Ivan Amato's article (Research News, 14 May, p. 895) about Martin Fleischmann and Stanley Pons' paper on calorimetric results in cold fusion (1) refers to me as saying that I "found the paper too difficult to assess with

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any confidence." This construction of my remarks is unfortunate because it conveys the unintended impression that I lack confidence in the experimental results of these researchers, whereas I indicated only that the publication is too difficult to understand fully in the time that I had to study it. It is true that this publication will not convince the case-hardened skeptics, but, as I told Amato, high-grade caloriometry is not necessary to evoke the reality of anomalous ("excess") power generation during the boil-off period well documented by Fleischmann and Pons. This phenomenon, as well as the various manifestations contrary to classical nuclear physics observed by a considerable number of researchers, deserves continuing study supported by adequate funding despite the difficult-to-reproduce nature of the experiments.

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References

In the photos accompanying the Research News article about the 1993 annual meeting of the American Association of Physical Anthropologists by Elizabeth Culotta ("At each others' throats," 14 May, p. 893), the three hyoid bones were not depicted in identical orientations. The hyoid of a pig, shown at the bottom, should have been rotated so that the arms of the bone point upward in order to match the orientation of the modern human and Neanderthal hyoid bones shown in the upper and middle photos.

In Traci Watson's article "Task force: Level the playing field" (14 May, p. 888), a table reprinted from a report by the National Institutes of Health contained incorrect figures. The numbers in the column labeled "Diversity" should have read from top to bottom as follows: $-3,945, -9,121, +$10,511, $-343, -$3,631, $-3,249, -$1,664, $-5,967, and $-2,754.

In Elizabeth Culotta's article "Entrepreneurs say: "It's better to be the boss" (Special Section, Women in Science '93, 16 Apr., p. 406), Henry Etzkowitz was incorrectly described as a sociologist at Rutgers University." Dr. Etzkowitz is at the State University of New York at Purchase.

In the caption to the photograph of researchers, the caption should have read:

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Career Development Seminars: (Saturday and Sunday only)
"Career Change Issues: From Academia to Industry"
presented by Ed Bocko, Protran Resources, Inc.
"Career Development for Scientific Professionals with Emphasis on Skill Building/Team Approach"
presented by Kym Goddu, Pfizer, Inc.
"Job Opportunities of Tomorrow: Projections on Hiring Needs in Biotechnology"
presented by Ed Bocko, Protran Resources, Inc.

10 August 1993, Tuesday
9:00 AM - 1:00 PM
Interviews only

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Vignettes: Success

It is never wise to seek prominence in a field whose routine chores do not interest you.

—Eugene Wigner, in The Recollections of Eugene Wigner, as Told to Andrew Stanton (Plenum)

For those propelled on the Wheel of Fortune, heady pursuits like thinking have become a casualty of the time crunch.

—Lee Burns, in Busy Bodies: Why Our Time-Obsessed Society Keeps Us Running in Place (Norton)

Man has mounted science and is now run away with.

—Henry Adams, 1852, as quoted by Ian Inkster in Science and Technology in History (Rutgers University Press)

gene” (though the editors question Mendel’s designation as the founder of genetics). Preceding the treatment of the masterwork itself are a 37-page life of Mendel and an introduction supplying “minimum basic information” about plant breeding and about peas. There follow 120 pages of “text and interpretation.” Here Mendel’s text is set off in a separate typeface and broken into blocks of typically 60 to 100 lines, numbered for easy reference, with interpretative comments of equal or greater length interspersed. The interpretation is focused on the text as such, without reference to secondary sources. After an epilogue in which the authors comment in a general way on more recent developments, there are appendices describing fertilization and meiosis, giving the chronology of Mendel’s experiments, discussing problems having to do with the relation between the seed and its coat, and considering, with some elementary statistics, “where is the bias?” in the experiments.

Finally, the book contains a glossary, a bibliography of mostly historical works, and an index. In October Rutgers University Press will issue it in electronic form as a “HyperBook,” with special arrangements possible for classroom use.

—Katherine Livingston