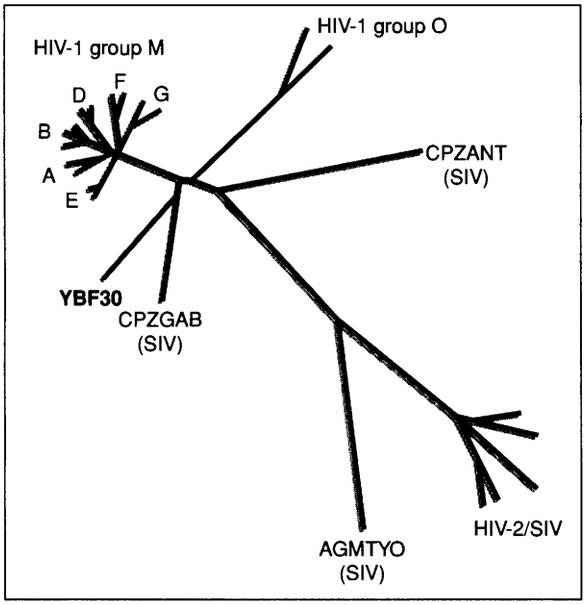
planting seismometers on opposite sides, may offer the definitive word on the core's mass and size. Still, Prospector scientists say that NASA's first moon mission since Apollo has taken more than a small step forward in lunar exploration. **–ROBERT IRION**

Robert Irion is a science writer in Santa Cruz, California.

AIDS RESEARCH

New HIV Strain Could Pose Health Threat

The human immunodeficiency virus (HIV), which causes AIDS, comes in so many genetic varieties that it is hard to keep them straight without a scorecard. Now, a team of AIDS researchers from France, Cameroon, and Gabon has added yet another branch to HIV's convoluted family tree: It has isolated a version of the virus from a Cameroonian woman who died of AIDS in 1995 that is sufficiently different from known strains that it may evade current blood tests. This new strain—which currently seems to be rare and localized—may provide new clues about HIV's origins, including when and how some viral strains might have jumped to humans from other primates.



Close cousins? New HIV-1 strain YBF30 may share a common ancestor with chimp SIV (CPZGAB).

Worldwide, most AIDS patients are infected with HIV-1, although a second virus, HIV-2, is responsible for some cases of a milder form of the disease in West Africa. HIV-1 itself is further subdivided into two genetically distinct groups, each of which is split into numerous subtypes separated roughly according to their geographical distribution. The new variant, designated YBF30, appears to be a member of an entirely separate third HIV-1 group, according to analyses published in the September issue of *Nature Medicine*.

The new strain was identified by a team led by virologist François Simon of the Bichat Hospital in Paris. The group includes French AIDS research pioneers Françoise Brun-Vézinet, also of Bichat Hospital, and Françoise Barré-Sinoussi of the Pasteur Institute in Paris. In 1994 and 1995, the researchers were conducting a study of HIV-1's genetic variability in Cameroon when they encountered a patient infected with a viral strain that was not detected by tests for the two already known groups of HIV-1: The M ("major") group, which accounts for the overwhelming majority of infections with HIV-1, and the O ("outlier") group, which is found almost exclusively in Cameroon. YBF30 did, however, react positively in a test for a strain of SIV—the simian version of HIV—isolated earlier from a chimpanzee in neighboring Gabon.

When YBF30's genome was later sequenced, the results confirmed that it belonged to a previously unknown group, which the team proposes calling the N group. Moreover, the sequence of one key part of YBF30's genome placed it much closer on the evolutionary tree to chimpanzee SIV than to either M group or O group HIV-1, although some other sections of the genome appear midway between chimpanzee SIV and M group HIV-1. AIDS researchers who spoke to *Science* found no reason to doubt that the YBF30 strain is the first discovered representative of a new HIV-1 group. "The data look good to me," says molecular virologist Beatrice Hahn of the University of Alabama, Birmingham.

The similarities between YBF30 and chimpanzee SIV suggest that the evolutionary ancestors of N group viruses might have been transmitted to humans from nonhuman primates. A similar scenario is thought to be responsible for the evolution of HIV-2, which is genetically similar to SIV strains that infect sooty mangabeys. Hahn says that chimpanzee-to-human transmission is a "likely" explanation for the existence of N group HIV-1, although she adds that it would be "hard to prove." Simon Wain-Hobson, an AIDS researcher at the Pasteur Institute, also cautions against drawing such conclusions too quickly, pointing out that only a

ScienceScope

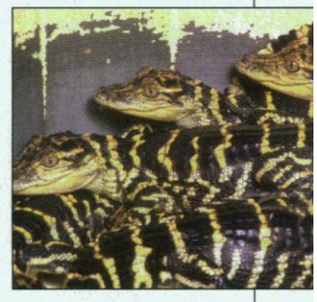
SOCIETIES LEAP INTO CALIFORNIA STANDARDS FRAY

The battle over science instruction in California is moving to a new front. This week, a group calling itself the "Scientists' Standards Project"—backed by the American Physical Society, the American Chemical Society, and the American Astronomical Society—charged that a draft set of science standards for state schools released in July stresses facts at the expense of concepts. They want the state Board of Education to give them a chance to revise the standards before the state finalizes them in October.

The debate erupted last fall, when the state got caught in a tug-of-war between two groups that wanted to draft the standards—one emphasizing facts and the other concepts (*Science*, 12 December 1997, p. 1885). Members from both groups produced a consensus draft of the standards in July. The draft represents a "very hard fought compromise," says Scott Hill, executive director of the California standards commission. He doubts substantial changes will be made before the October deadline.

EPA TO EXPOSE HORMONE IMPOSTORS

Environmental scientists are preparing for a massive chemical hunt. This month, the U.S. Environmental Protection Agency (EPA) finalizes plans for its endocrine disrupter screening program, which will require companies to spend millions of dollars to test thousands of chemicals for their potential to wreak havoc on the hormonal systems of people and wildlife.



Disrupted. Baby alligators.

Studies have shown that synthetic chemicals found in many common products—from pesticides to plastics—can mimic the behavior of estrogen and other hormones in wildlife, disrupting everything from sexual development to immune resistance. But it's not clear if the substances pose a threat to people. To find out, in 1996 Congress asked the EPA to identify the riskiest compounds.

The effort, to start later this year, won't provide all the answers, but Tufts University physician Ana Soto says screening is "an important first step."

GERRY DAVIS/PHOTOTAKE/PNI

SUPERCONDUCTIVITY

Theory Debate Gets Literary, and Ugly

Research papers are rarely a lively read. The results being reported might be of immense significance, but the papers are almost always written in the formal, impersonal style that has come to characterize scientific publications. Not so for a recent paper in *Physical Review Letters* (*PRL*), which compared one "not so beautiful" theory of high-temperature superconductivity (HTS) to a "figure in a cartoon" and made withering use of literary references.

Soon after researchers showed in 1986 that complex copper-oxide ceramics could conduct electricity without resistance at temperatures far higher than the metal alloys that held the record at the time, it became obvious that the existing theory of superconductors could not explain the new materials. When the maximum superconducting temperature stalled at about 125 kelvin, researchers looked to theorists to provide some guidance around the impasse, but so far they have shed little light. Indeed, it is often remarked that there are as many HTS theories as there are theoretical physicists working on the problem. As a result, says Julius Ranninger of the Centre for Very Low Temperature Research in Grenoble, France, the world of HTS theories is "very delicate, with a lot of bad blood and infighting."

> **The HTS theory world is "very delicate, with a lot of bad blood and infighting."**
>
> **—Julius Ranninger**

Ranninger should know. He was an author, with Benoy Chakraverty and Denis Feinberg of the Laboratory for the Study of the Electronic Properties of Solids in Grenoble, of the *PRL* paper that has sparked the latest debate, which is as much about style of discourse as it is about science. The paper discusses a theory that attributes superconductivity to bound pairs of polarons—the distortion in the crystal lattice of an HTS material caused by the charge on an electron. The formation of electron pairs is an essential feature of any theory of superconductivity. In 1981, before the discovery of HTS, Ranninger and Sasha Alexandrov, now at Loughborough University in the United Kingdom, published a paper suggesting that the pairs of polarons, or bipolarons, might be superconducting. Alexandrov has continued to champion the bipolaron approach, but Ranninger has since abandoned it.

The title of the paper by Chakraverty, Ranninger, and Feinberg, "Experimental and theoretical constraints of bipolaronic superconductivity in high-T_c materials: An impossibility," hinted at its tone. And there was no circumspection in its statement that "We shall show that extending the bipolaron theory for superconductivity to [HTS] materials is fallacious." The paper claims to show that the bipolaron theory is unable to predict superconducting transition temperatures any higher than 10 kelvin—clearly too low to explain HTS. But what has most angered proponents of bipolaron theory is the authors' parting shot: "The tragedy of beautiful theories, Aldous Huxley once remarked, is that they are often destroyed by ugly facts. One perhaps can add that the comedy of not so beautiful theories is that they cannot even be destroyed; like figures in a cartoon they continue to enjoy the most charming existence until the celluloid runs out."

It was Thomas Huxley, not Aldous, who mused on the fate of beautiful theories at the hands of ugly facts, but the mistake did not lessen the sting. On 13 July, the same day that the paper appeared in *PRL*, Alexandrov submitted a "comment" on the paper to *PRL* and the Los Alamos e-print server in which he argued that the objections in the paper were "the result of an incorrect approximation ... and the misuse of the bipolaron theory." He concluded by stating: "What is clear, however, is that any theory, beautiful or not, cannot be destroyed by 'ugly' artifacts [such] as those in Chakraverty *et al.*" In an interview, Alexandrov added that he found the final paragraph "unhealthy and not motivated by any reason." Moreover, he adds, he has heard the same reaction from many other physicists.

Ranninger says the last paragraph of the paper was written specifically to "calm the situation" and does not think that it was provocative. Reaction to the paper in the HTS community has been mixed. In a letter to Ranninger, Alexei Abrikosov of the Argonne National Laboratory in Illinois wrote: "I would like to express my pleasure upon reading your paper about bipolaronic superconductivity. I completely agree with it, and I appreciated the last two sentences." Alan Bishop of Los Alamos National Laboratory in New Mexico, however, calls the tone of the *PRL* paper "unhelpfully polemic." Bishop adds, "I might comment in the same vein [that] 'Beauty is in the eye of the beholder.' In this case there are several beholders."

–PETER RODGERS

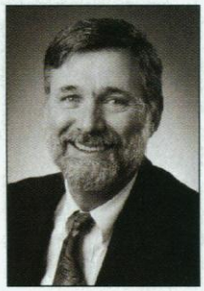
Peter Rodgers is editor of *Physics World*.

ScienceScope

STANFORD PSYCHIATRIST FINED IN TENURE BATTLE

Stanford University has fined and suspended a tenured psychiatrist in the latest round of a case that some observers see as a worrisome sign of university attempts to narrow the rights associated with tenure.

Stanford's Academic Council ruled last month that Adolf Pfefferbaum, a 22-year veteran of the Palo Alto Veterans Administration Hospital known for his research on schizophrenia, flouted school policy when he quit the hospital in 1996 due to what he called "intolerable" working conditions. He asked to move to the university's medical school, where he had a joint appointment. The university refused, arguing that he had lost his protected post when he left the VA, his primary employer (*Science*, 3 October 1997, p. 27). After Pfefferbaum sued, a judge ordered him reinstated pending a university inquiry, completed recently. In its report, the council concluded that Pfefferbaum—now the head of psychiatry at SRI International in Menlo Park, California—had failed to prove a "hostile" working environment and had no right to "unilaterally" change his academic duties. Although President Gerhard Casper wanted to fire the errant professor for neglect of duty—and made it clear that he will not tolerate similar gambits by other academics—the council recommended leniency. It suspended Pfefferbaum for 3 years and ordered him to pay a $20,000 fine if he wants to come back to campus. The decision helps clarify what constitutes a "reasonable academic assignment," says Stanford statistician Bradley Efron, one of the report's authors.



STANFORD

Adolf Pfefferbaum

Pfefferbaum's attorney, former California congressman Pete McCloskey, says his client has not yet indicated whether he will return to Stanford. Meanwhile, McCloskey says he will ask a judge to overturn Stanford's "unconscionable" action when he goes to court on related litigation in September. He adds: "We have not yet begun to fight."

Contributors: Gretchen Vogel, Robert Service, and Constance Holden