

data files that he claims are not handled correctly or conveniently by SYSTAT.

Wilkinson's charges and Lewicki's countercharges have struck a nerve among academics. According to William Eddy, a statistics professor at Carnegie-Mellon University in Pittsburgh and chairman of the National Research Council's (NRC) Committee on Applied and Theoretical Statistics, leaders in the field have been trying for 15 years to establish guidelines for computer programs, and it has been hard to reach a consensus, because every program has its flaws and its devotees. "Every package has a bug," says Paul Tukey of Bellcore. "It's a threshold question" as to how many and what kind are acceptable. The NRC panel held a meeting on the subject earlier this year and will be issuing papers soon, Eddy says.

A key point of contention is the ability of the competing programs to handle "ill-balanced" data sets. For example, Wilkinson and Lewicki both say their adversary's program yields poor results in an Analysis of Variants, or ANOVA, procedure, often used to compare results from experiments in which some subjects receive a treatment and other "controls" receive none. The problem is that if this procedure is done mechanically, it will yield some "cells" that are devoid of data and should not be used to generate additional data. Wilkinson claims that his adversary's program merely warns that some results "may not be estimated correctly because of missing cells," and then goes on to print erroneous data, while his own program, in contrast, grinds to a halt and asks the user to try another analytical method.

In defending against these allegations, StatSoft presented a long discussion of flaws that allegedly appear in SYSTAT when there are gaps in the data, citing a statistics textbook coauthored by University of Kansas professor Dallas Johnson. But Johnson himself isn't buying StatSoft's contentions. Wilkinson sent Johnson a copy of a page from StatSoft's pamphlet. Johnson's opinion: Much of it "has no meaning at all." The procedure used by StatSoft as an illustration "shouldn't be computed at all," says Johnson. His own view is that "it's better not to produce than to produce something wrong," and he says he favors programs that balk at erroneous instructions.

The debate rages on, having now entered the rebuttal-of-rebuttals stage with no end in sight. Despite the anguish it may be causing the two protagonists, however, it may be doing some good. Already, both sides have identified flaws in the other's program, and this will lead to quick improvements. And potential users are getting a graphic lesson in the limitations of statistical software packages. ■ ELIOT MARSHALL

A Lethal "Cold Fusion" Blast

In the latest, deadly chapter in the bizarre history of "cold fusion," an explosion of a deuterium-palladium electrolysis experiment at SRI International in Menlo Park, California, killed one researcher and injured three others on 2 January. The fatally wounded scientist, Andrew Riley, was a contract researcher for the Electric Power Research Institute (EPRI), which has funded SRI's research on deuterium-palladium electrolysis since 1989. Also injured were laboratory director Michael McKubre, SRI researcher Stuart Smedley, and EPRI contract scientist Steven Crouch-Baker.

Few details of the explosion were available as *Science* went to press. SRI spokesman Dennis Maxwell was quoted in the *San Francisco Chronicle* as saying the accident occurred while three of the scientists were lifting a steel cylinder containing a palladium electrode in a deuterium oxide electrolyte from a water bath and placing it on a shelf. The *Chronicle* also reported that an emergency services officer said the explosion took place when one of the scientists attempted to open a jammed valve on a cylinder containing deuterium. Maxwell could not be reached for comment, but an SRI spokeswoman confirmed his statement.

At the Second International Cold Fusion Conference in Como, Italy, last June, McKubre reported measuring reproducible "excess" heat in a deuterium-palladium electrolysis cell. Although neither McKubre nor members of his laboratory returned calls from *Science*, EPRI program manager Joseph Santucci says that McKubre had achieved reproducible excess heat production by discovering how to "load" the palladium electrodes with deuterium molecules at an atomic ratio approaching unity. The explosion occurred during an attempt to "scale up" McKubre's earlier experiments, Santucci said.

Hydrogen explosions in electrolysis experiments involving palladium are not unknown, since the metal can catalyze an explosive recombination of hydrogen and oxygen. Santucci admits that such a conventional explanation might account for the explosion, but he claims it is "unlikely," since preliminary information suggested that the energies released were "substantial." More information will come to light over the next 2 or 3 weeks, as EPRI investigators pore over the cell's remains, analyze the palladium electrode, and take readings from some 17 instruments that were recording data when the cell exploded. ■ DAVID P. HAMILTON

Russian Academy: So Far, So Good

Russia's beleaguered scientists finally have a little good news to celebrate: Last month's forced merger of the All-Union Academy of Sciences (the key scientific institution of the Soviet Union for more than 50 years) with its just-created rival, the Russian Academy of Sciences, has so far gone much more smoothly than expected. Instead of dismantling the academy and flooding it with political appointees—as many top scientists feared—applied mathematician Yuri Osipov, the newly elected president of the combined Russian Academy of Sciences, is instead protecting academy scientists and bringing in democratic reform.

Last November, when it became plain that the All-Union Academy would be forced to merge with the Russian Academy, many scientists complained that control of research might rapidly pass out of the hands of the nation's best scientists. Biochemist Evgenii Sverdlov, a corresponding member of the old All-Union Academy, was among those who feared the worst (*Science*, 20 December 1991, p. 1717). But now Sverdlov has changed his tune. "The situation in the academy has improved dramati-

cally," Sverdlov told *Science* from Moscow this week. He says that the few new members who have been brought into the academy are all reputable scientists.

And Osipov—an early supporter of the rival academy—has turned out to be "more or less the right person" to run the combined academy, says Sverdlov. Thanks to his close links to Boris Yeltsin (both are from Sverdlovsk) he has been able to argue for increased support for science. New democratic institutions, including the free press and an elected parliament, have also enabled scientists to put pressure on the Yeltsin government, says Sverdlov. One result: Yeltsin appeared before the inaugural session of the merged academy and assured scientists that the Russian government would double their salaries.

But daunting problems remain. Present levels of funding for the academy's institutes will continue only until March; then decisions will have to be made on cutting staff and closing unproductive institutes. That is when a mighty power struggle will begin as scientists fight to keep their own institutes—and jobs—alive. ■ STEVEN DICKMAN