

## SCIENCE NEWS OF THE WEEK

# Rulings from the High Court

Health and technology issues crossed the nation's highest judicial arena several times last week as the U.S. Supreme Court's term drew to a close. In three separate 5 to 4 decisions, the high court struck down a federal benzene standard, ruled to allow monopoly sale of certain unpatented chemicals and upheld the Hyde Amendment, which limits abortions paid by Medicaid. In one of those cases — the benzene decision — the closely split vote is the government's silver lining in the dark cloud of defeat.

## Benzene

In the benzene case, the Supreme Court deemed an Occupational Safety and Health Administration's regulatory standard as unjustifiably stringent. The standard — which first met with opposition shortly after it was promulgated in 1977 — lowers the workplace exposure limit to airborne benzene from 10 parts per million (ppm) to 1 ppm and prohibits skin contact with benzene solutions.

Produced primarily by petroleum industries, benzene (C<sub>6</sub>H<sub>6</sub>) is a chemical necessity in rubber, pesticide, detergent and paint industries. The substance is a clear, colorless liquid that under ordinary atmospheric conditions gives off vapors nearly three times heavier than air. Inhalation of these vapors — the primary route of entry of benzene into humans — is followed by swift absorption into the bloodstream where the chemical can decrease red cell level (anemia), decrease white cell level (leukopenia) and depress platelet count (thrombocytopenia). In addition, benzene has been shown to cause leukemia at high exposure levels.

In accordance with its policy to control employee exposure to carcinogens, OSHA attempted to institute its limit of 1 ppm exposure to benzene. But the Supreme Court overturned the standard "on the grounds that it was not supported by appropriate findings." The judgment of the Court, delivered in an opinion by Justice John Paul Stevens, states that "OSHA's rationale for lowering the permissible exposure limit to 1 ppm was based, not on any finding that leukemia has ever been caused by exposure to 10 ppm of benzene and that it will *not* be caused by exposure to 1 ppm, but rather on a series of assumptions indicating that some leukemias might result from exposure to 10 ppm and that the number of cases might be reduced by reducing the exposure level to 1 ppm."

Moreover, writes Justice Stevens, although the burden of proving that a substance is safe sometimes falls on "the party opposing the proposed rule" — industry, for example — Congress intended

OSHA to "bear the normal burden of establishing the need for a proposed standard." In the benzene case, the Court concludes, "OSHA did not even attempt to carry its burden of proof."

Interestingly, industry took it upon itself to "bear the burden of proof" of clearing up at least one question in the benzene case — whether prohibiting dermal contact of benzene is justified. The Rubber Manufacturers Association funded studies to measure transport of benzene through the skin of rhesus monkeys. In the studies, headed by dermatologist Howard Maibach of the University of California at San Francisco, only small amounts of benzene could be measured in the urine and feces of the monkeys after application to the skin, signaling little penetration.

Equally as important as the burden of proof issue in the benzene case is the

## Patents for Unpatentable Chemicals

A controversial Supreme Court ruling legitimizes a restraint-of-trade practice that could prove highly profitable in the chemical and pharmaceutical industries.

The case involves a confusing and complicated charge of "patent misuse" brought against Rohm and Haas, a chemicals manufacturer, by competitors who willfully engaged in "contributory infringement" of a process Rohm and Haas had patented. At issue was not whether patent infringement occurred. Competitors readily admitted to engaging in it: They claimed they had to because of illegal, monopolistic practices by Rohm and Haas constituting patent misuse. The Court did not agree.

Propanil (3,4-dichloropropionanilide) was discovered 50 years before any use for it was found. Then, in 1974, Rohm and Haas patented what is now the compound's only known use — application to rice as a herbicide. Since the chemical had been around for so long, it was unpatentable. But in legal jargon, propanil is a "nonstaple" product, one whose sole use is tied to a patent. And legal precedent has established that the sale of nonstaples may require licensing in the same way a patented item or process does.

Several firms, including the Dawson Chemical Co. (a plaintiff in this case), sought licenses to sell propanil. Rohm and Haas refused them all. So competitors sold the chemical without a license, including the patented directions for use on the side of each package. By doing so, competitors contributed to unlawful infringement of the Rohm and Haas patent every time a farmer used their product.

Arguing for the majority, Justice Harry A. Blackmun wrote that nowhere does the

cost-benefit question — whether OSHA must be able to justify an exposure limit by comparing the number of workers who will benefit from a limit with the industrial costs of meeting that limit. Unlike the burden of proof issue, however, the cost-benefit question was left open in the benzene case and is expected to be resolved in the fall when the Court rules on a separate OSHA standard for vapors given off by coke ovens in the steel industry.

In sizing up its chances of success in the coke oven case, OSHA takes heart in the closely split benzene decision. Says OSHA lawyer Kenneth Geller, "There are four votes for OSHA's position in the benzene case. I don't know what's going to happen in Republic Steel [the coke oven case] but I think it will be another closely divided case." And, says Geller, "I just hope the government can get more than four votes."

law explicitly require a patent holder to license use of its patent or related nonstaples. As such, Blackmun wrote, the charge of patent misuse is unfounded.

But the dissenting justices made an equally strong case arguing that while a patent holder may require competitors to obtain licenses before selling a nonstaple, patent law does not offer explicit protection against charges of misuse for patent holders who engage in such monopolistic practices as refusing to license rights to their patents. Acknowledging that the Rohm and Haas patent "may well have little or no commercial value unless the patentee is permitted to engage in patent misuse," Justice John Paul Stevens argues that "surely this is not a good reason for interpreting [patent law] to permit such misuse."

## The Hyde Amendment

The Hyde Amendment, which restricts funding for Medicaid abortions, has had a stormy history. It was passed by Congress in 1976 and was in effect from August 1977 to February 1980. Then a Federal District Court judge ruled that the amendment violated both the First and Fifth Amendment rights of Medicaid-eligible women and ordered the resumption of Medicaid payments for all abortions. Last week that decision was overturned by the Supreme Court and once again Medicaid funding for most abortions will cease.

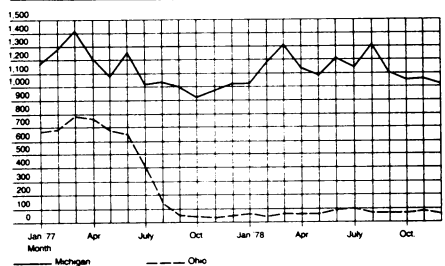
A study analyzing the impact of this ruling is reported in the May/June FAMILY PLANNING PERSPECTIVES, a magazine of the Alan Guttmacher Institute, a corpora-

tion for research, policy analysis and public education. The article is by James Trussell, Jane Menken and Barbara Vaughan of the Office of Population Research at Princeton University and by Barbara L. Lindheim, a senior research associate with the Alan Guttmacher Institute.

Trussell and his colleagues wanted to determine what the availability, or absence, of the Hyde Amendment would mean to low-income women wanting abortions. To find out, they compared the number of women seeking abortions while the Hyde Amendment was not in effect (from February to July 1977) with the number of women seeking abortions while the amendment was in effect (from February to July 1978). The difference, they reasoned, "would thus yield a minimum estimate of the impact of the funding cutoff." The researchers' sources included Medicaid offices, vital statistics offices and major abortion providers in Georgia and Ohio — two states with sound Medicaid data and ample geographic diversity.

As they report, 23 percent of Medicaid-eligible women in Ohio and 18 percent of Medicaid-eligible women in Georgia who would have obtained an abortion in 1977 did not do so in 1978. In other words, the Hyde Amendment reduced abortions among Medicaid-eligible women by about 20 percent.

What did these 20 percent do about their pregnancies? The data show that many went on to pay for legal abortions out of their own pockets or managed to obtain abortions funded at the state or



**The amendment didn't reduce Medicaid abortions in Michigan, which paid.**

local level. The study does not shed light on the question of whether any of these women resorted to illegal or self-induced abortions because they could not pay for a legal one. However, through its monitoring system, the Center for Disease Control in Atlanta did report in 1979 that four Medicaid-eligible women had died from illegal or self-induced abortions because they had not been able to obtain legal abortions with Medicaid funds.

Now that the Hyde Amendment appears here to stay, does that mean that 20 percent of the 295,000 American women per year who would have had Medicaid-paid abortions will no longer obtain legal abortions? The answer probably depends on how many states will decide to pick up abortion tabs that used to be paid by Medicaid. Twenty-two states now do so. □

## Early auroras: Windows to the changing sun



NASA

Historic records of auroras like this one may reflect long-term solar changes.

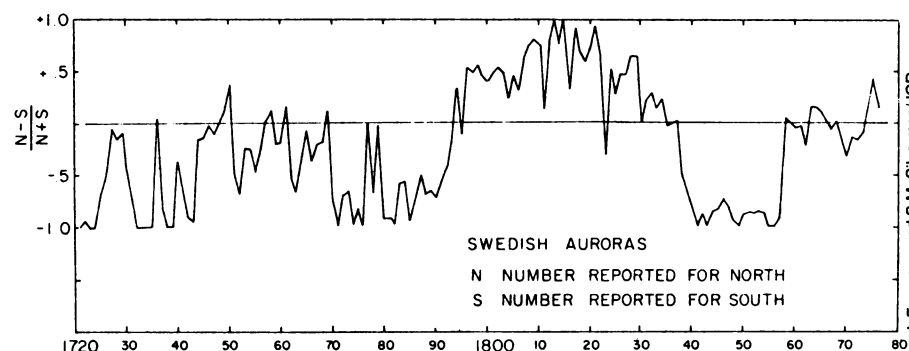
In recent years there has been a virtual explosion of scientific studies suggesting that the sun, once assumed to be an essentially constant beacon in the sky, not only changes significantly in different ways and timescales, but also affects various phenomena on the earth. The so-called "Maunder minimum," for example, was a period from about 1645 to 1715 during which the number of sunspots dropped to near-zero in sharp contrast to the dozens of sunspot-cycles recorded before and after it. In fact, however, points out George Siscoe of UCLA, the Maunder minimum was originally reported (in 1733) not as a sunspot effect at all but as a change in the number of auroras seen on the earth — a proposal that earned its French author (J.J.O. de Marain) the ridicule of the French scientific establishment for suggesting such a long and pronounced effect with no apparent cause.

The linkages between solar causes and terrestrial responses are known to be complex, but, though they are only sketchily understood, they are no longer dismissed out of hand. Now a pair of Massachusetts researchers has noted long-term variations in the number and latitudinal extent of auroras observed during the 18th and 19th centuries, and concluded that these changes too "reflect fundamental

long-term changes in the sun itself."

A key document in the study, according to Joan Feynman of Boston College and Samuel M. Silverman of the Air Force Geophysics Laboratory at Hanscom AFB, was a compilation of aurora sightings in Sweden from 1720 to 1876, published in 1879 and 1882 by Robert Rubenson, director of the Central Meteorological Institute of Sweden. Rubenson's sources ranged from journals and manuscripts to newspapers, but, Feynman and Silverman report in the *JOURNAL OF GEOPHYSICAL RESEARCH* (85:2991), "since the series was very carefully collected by a single knowledgeable person and refers to a geographically restricted area, it forms as nearly consistent a set of data as can be available from this period." The authors, in fact, dedicated their JGR paper to Rubenson for his work, noting that their own study was done in 1979, the centennial of the publication of part one of his catalog.

The researchers divided the listed auroras into those reported from northern Sweden and from southern Sweden. When the solar wind, source of the auroras, is weak, they maintain, the auroras too are weak, and the roughly circular region in which they occur contracts to a smaller belt at higher latitudes. From 1793 to 1837, the analysis shows, almost all auroras re-



J. Feynman and S.M. Silverman/JGR

Numbers of auroras sighted in northern vs. southern Sweden, compiled by R. Rubenson.