

More from the American Geophysical Union meeting

Weather between satellites

Radio signals sent from one satellite to another through the atmosphere have been used for the first time to measure atmospheric temperature and pressure profiles extending all the way down to sea level. The test was conducted between the polar-orbiting Nimbus 6 weather satellite and the geosynchronous Applications Technology Satellite 6, which was then positioned about 35,000 miles above Lake Victoria in Africa.

In the test, signals were sent from the ground to ATS-6, and were then retransmitted to Nimbus 6 just as the latter satellite had come over the South Pole to a latitude of about 70°S. The signal path thus formed an earth-grazing tangent, which moved away from the earth as Nimbus 6 got farther from the pole. By measuring the changing delay and refraction of the signal by the atmosphere, researchers were able to calculate the temperature and pressure of the air through which the signal was passing. The results, according to Charles W. Murray Jr. and John W. Marini of the NASA Goddard Space Flight Center, were about 95 percent accurate in pressure and 93 percent in temperature compared with measurements from radiosonde balloons.

Mercury's stretch marks

Two near-global fault patterns on Mercury are probably due to shrinkage of the planet's equatorial bulge as its early rapid spin rate decreased, according to Jay Melosh and Daniel Dzurisin of California Institute of Technology. Stresses from the shrinking bulge in a rocky planetary crust may reach "a few kilobars," they calculate, with the resulting fracture pattern depending on crustal thickness. In Mercury's case, the first pattern began at the equator and spread poleward at angles from the meridians of longitude. When it reached about 70° latitude, the researchers believe, the second pattern began at the equator, this time oriented along the meridians.

Gamma-ray bursts from distant sources

Sporadic gamma-ray bursts have been detected by a variety of earth-orbiting satellites designed for other purposes, but the German-built Helios 2 probe circling close to the sun is reportedly the first spacecraft carrying an instrument designed specifically for that purpose. Data from Helios 2 have now confirmed for the first time that such bursts do not originate from within the solar system and have indicated that, at least where reasonable directional determinations have been possible, they do not seem to come from known X-ray sources.

Four gamma-ray burst events were detected by Helios 2 in the early part of 1976, according to Thomas L. Cline and colleagues from NASA Goddard. Comparing the detection times of the events at Helios 2 with the times at earth-orbiting satellites has provided, says Cline, "the most accurate burst-source locations to date, with celestial error bands as narrow as 2 minutes of arc." The intensities and times were the same in the two regions of space, he says, suggesting that the sources are distant from both.

The most accurately located of the events—the three that occurred when Helios 2 was most distant from the earth—also failed to match the known directions of any of the X-ray sources listed in the third catalog of observations by the Uhuru X-ray astronomy satellite. One gamma-ray-burst source may have been located, however, an event detected by Helios 2 has a direction and a "time-history" consistent with another event detected four years earlier by an earth-orbiting satellite.

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Good news and social behavior

If you lose your wallet on the streets of New York there is about a 45 percent chance that it will be returned within a couple of days. This figure was arrived at experimentally (psychology students dropped wallets and waited for them to be returned). Just as the experimenters were about to confirm the 45 percent return rate, they got some bad news. None of the wallets dropped on June 4, 1968, were ever returned. The night before, Sirhan Sirhan had shot Robert F. Kennedy, and the researchers soon concluded that the news of Kennedy's murder had temporarily damaged whatever social bonds had caused people to return the lost wallets. Since then the researchers, Stephen M. Holloway and Harvey A. Hornstein of Teachers College, Columbia University, have been attempting to discover how various types of media news reports might affect social behavior.

In one experiment a room full of subjects waiting to take part in a psychological investigation listened to a music program on the radio. The music was interrupted by one of two short news reports (a clergyman donates a kidney to save a dying man's life; a clergyman strangles a 72-year-old sculptress, beloved by neighborhood children for her statues of Winnie the Pooh). Subjects did not know that the news items had been faked and were part of the experiment. They were then asked to answer questions about the moral and ethical dispositions of people in general. Those who had heard the good news had significantly higher opinions of their fellows than did those who had heard the bad news.

Not only attitudes and beliefs about others but behavior toward others seems to be affected by news stories. The fake news ploy was used with other groups of subjects who were then put into situations where they could either compete or cooperate with a stranger. Those who had heard the good news were more likely to be cooperative, while the others were more competitive. Further experiments suggest that it is news that is attributable to some human deed, rather than natural causes that affect attitudes and social behavior. "It requires only a small stretch of the imagination," say the researchers, "to see what might be happening *outside* the laboratory when people hear bad news. They are likely to become more competitive and less cooperative." News about the evil deeds of other humans breaks social bonds, they say. "It teaches us that other people are not like us. The disruption of group ties, in turn, leads fairly logically to various selfish, distrustful and antisocial attitudes and behavior. . . . We believe that this finding places a new and very heavy burden of responsibility on the news media."

Male-female earnings gap widens

More and more women are joining the labor force but women are falling farther and farther behind in the earnings race with men. In fact, the gap between the earnings of women and men has nearly doubled since 1955, according to the Women's Bureau of the U.S. Department of Labor. In constant dollars, taking inflation into account, the gap increased from \$1,911 in 1955 to \$3,433 in 1974. The 1974 median earnings for women were only \$6,772 compared with \$11,835 for men. Although women were 32 percent of the year-round, full-time workers in 1974, they accounted for 63 percent of the workers earning less than \$5,000. Women made up only 5 percent of the workers earning \$15,000 or more. Two reasons are cited for the widening gap: the continued concentration of women in low-skilled, low-paying occupations and the increase in women's labor force participation that has resulted in a larger proportion of women in or near the entry level of jobs.

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