



Wood/Nature

Solar tidal fluctuations (up or down) compared to sunspot numbers since 1900.

casts stressing the desirability of prior consent on the part of the receiving state.

The U.N. General Assembly voted 101 to 1 to "consider it necessary to elaborate principles governing the use by states of artificial earth satellites for direct television broadcasting with a view to concluding an international agreement or agreements." The General Assembly asked the Outer Space Committee of the U.N. to elaborate such principles.

The Soviet Union introduced a treaty that would, among other things, allow a state to take all measures to prevent so-called illegal broadcasting from such satellites (even to destroying the transmitting satellite). The Soviet intention was for this treaty to become the primary basis for any treaty ultimately signed. The resolution calling for elaboration of "principles," however, in effect denied the Soviet Union this strategy.

George Bush, U.S. ambassador to the U.N., in speaking against such curbs, noted that the United States attaches a cardinal importance to its "strong, 200-year-old belief in the free exchange of information and ideas." He also questioned whether such restraints would not be in violation of the Universal Declaration of Human Rights (a U.N. document) which embraces the freedom of information. No such restraints, for example, are placed on radio transmissions—probably because finding and destroying all the transmitters would be a mammoth task. □

## Do tugs of the planets affect the sun's cycles?

The influence of the sun on the planets that go around it determines the conditions found on them. Most of the scientific literature on the sun assumes that there is no reciprocity: The planets have no influence on the various upheavals, sunspots and flares, that characterize the surface appearance of the sun. These are regarded as caused by occurrences deep within the sun.

In the Nov. 10 NATURE R. K. Wood of the University of Colorado points out an interesting relationship between the 11-year cycle of sunspots and a known influence of the planets on the sun, the solar tides. Just as the moon and the sun raise tides on the earth so the planets raise tides on the sun.

The tidal influence of a planet depends both on its size and its distance. There are four planets that contribute appreciable effects to the solar tides. Taking the earth's contribution as one, the relative contribution of each of the others is: Mercury 1.15, Venus 2.17 and Jupiter 2.28. The remaining five planets make only negligible contributions. When Venus and earth are in line (conjunction or opposition), they cause a solar tide 50 percent greater than the largest caused by Jupiter. When Venus, earth and Jupiter are all in line, the tidal effects of the three planets add together at any point on the sun. In his calculations Wood left out the influence of Mercury because that planet's

tidal effect has a three-month cycle, and so it would have little effect on the 11-year sunspot cycle.

Wood plotted the tidal height fluctuations since 1750 for each interval between dates of earth-Venus conjunction and earth-Venus opposition against the smoothed monthly number of sunspots for the center of each interval. The result is graphs comparing the two data that seem to show a correlation between peak times of tidal variation (rise or fall) and peak numbers of sunspots.

There is a small difference between tidal maxima and sunspot peaks, the error of prediction of the peaks, as Wood calls it, which seems to vary according to a 170- or 180-year cycle.

Assuming that this cycle in the error of peak prediction is real, Wood publishes predictions of the sunspot peak, derived from computation of the solar tides, for the next 130 years (12 sunspot cycles). But he does not suggest a mechanism whereby the tides could influence the production of sunspots. □

## Poor nutrition: How is the fetus affected?

The quest for evidence about the effects of a prospective mother's diet on the mental development of her child is one of the most active interests of nutrition scientists. So far evidence is not only inconclusive but contradictory.

During the past few years, for example, investigators have determined that children born to malnourished mothers in Chile had fewer brain cells than control children. In Guatemala, giving protein supplements to women increased the birth weight of their offspring but did not appear to influence their intelligence.

Now, in the Nov. 17 SCIENCE, Zena Stein and colleagues at the Columbia University School of Public Health and Administrative Medicine report that young people who experienced the severe famine in Holland from 1944 to 1945 prenatally have not suffered loss of intelligence because of it.

The Columbia team studied 2,000 19-year-old subjects from seven cities in Holland. The subjects' intelligence was compared with that of 19-year-olds in 11 Dutch cities where the famine had not hit. The investigators found no comparable difference in intelligence between the two groups. They admit, though, that their results should be viewed with caution. For example, they compared subjects from cities that differed not only in famine experiences but also in size, religion and occupations. There is the question of whether the intelligence criteria they used (data from military induction exams) are accurate. Also, they looked at the effects

## Social science, social policy and 'unfounded generalizations'

One of the most visible examples of social science's impact on social policy is the continuing controversy about busing. Busing became a tool to achieve racial and economic integration in schools in the 1960's after the Coleman Report and others like it indicated that equality of education would lead to equality of opportunity for all social and racial groups. But the bus backfired. It became a racial, economic and political issue. When this happened some sociologists seemed to change their tune and the politicians began to march to the beat of a different drum.

Early this year, for instance, a group of researchers at Harvard suggested in a reevaluation of the Coleman Report that busing may not be the answer to equal opportunity. The quality of home life, they said, is more important than the quality of education (SN: 3/18/72, p. 183). Then this summer, when anti-busing was the politically expedient position, David J. Armor of Harvard published an article in *THE PUBLIC INTEREST*. He concluded that Coleman's results were confusing and that busing might actually lead to increased racial solidarity and tension (SN: 5/27/72, p. 342). Politicians who never heard of the Coleman Report were quick to pick up and use Armor's conclusions.

Armor's argument, however, will be rebutted in a future issue of *THE PUBLIC INTEREST* when Thomas F. Pettigrew of Harvard points out that Armor was selectively negative and obscured many of the positive effects of busing. Pettigrew's argument, in turn, will probably be hotly debated and the busing fight will continue until one side or the other proves its point or until the lawmakers step in.

Busing, however, is not the real issue. At the heart of the matter lies the nature-nurture controversy. Is the end product of education primarily a factor of environment or heredity? Most researchers agree that both elements are involved. The question is how much.

Some researchers, such as Arthur R. Jensen (SN: 7/10/71, p. 25), feel that the genetic factors are more important and that no amount of education or environmental enrichment will make up the difference. Others have attempted (usually with studies of monozygous and dizygous twins raised together) to show that environmental deprivation is the prime cause of the lower mean I.Q. found among various social and racial groups. One such study was reported last year in *SCIENCE* by Sandra Scarr-Salapatek of the University of Minnesota (SN: 1/1/72, p. 11).

Like the busing issue, both sides of this more basic issue

are open to attack. The research of Jensen and those like him has been attacked as one-sided and racist. Now the research of Scarr-Salapatek is attacked as inconclusive and ambiguous.

L. J. Eaves and J. L. Jinks of the University of Birmingham in Birmingham, England, believe that the relative contributions of inheritance and environment cannot be disentangled. They attempt to prove their point in the Nov. 10 *NATURE* by taking apart and critically analyzing Scarr-Salapatek's study. They conclude that her analysis involves untestable assumptions about the relative magnitude of genetic and environmental components. They go on to say that nearly 4,000 pairs of twins would be needed to provide a 95 percent chance of detecting even gross differences between the heritability of a trait in the black and white sections of the Philadelphia schools studied. Scarr-Salapatek's final sample consisted of only 992 pairs of twins. "On purely theoretical grounds," Eaves and Jinks conclude "that this particular experimental design, with the small samples available, could not be expected to lead to the conclusions which were drawn and indeed could only be drawn from it by omitting proper tests of significance."

Warning: This research may be hazardous to your social policy.

So, without conclusive evidence, both sides of the argument remain vulnerable and it is clear that the controversy is nowhere near a conclusion. For these reasons, it has been suggested that a moratorium be called on such investigations. It would seem unwise, however, to put a halt to scientific investigation. This would only postpone the eventual outcome—whatever it may be.

Instead, says *NATURE* in an editorial accompanying the Eaves-Jinks article, social scientists should ensure that they do not erect "unfounded generalizations" on the available data. Because the subject is so contentious, social scientists should be more than ordinarily aware of the possible public impact of the publication of their research. The editorial even suggests, "in these exceptional circumstances, there is a case for saying that any strictly scientific article should be accompanied by a warning that its conclusions, however valid, are likely to be irrelevant to the making of social policy."

of acute maternal starvation on the fetus, not at the effects of chronic maternal malnutrition, which would more closely approximate the situations in developing countries and inner American cities.

Last week, at a National Foundation-March of Dimes Symposium on nutrition and fetal development, David Rush, also of Columbia's school of public health, reported that he is heading up a study in Harlem to determine the effects of more chronic maternal malnutrition of fetal intelligence. One group of pregnant women is eating a normal diet. Another group receives nutrition supplements. Still another group receives extra good nutrition supplements.

The food is delivered to the women's homes. Urine samples are taken to make sure the women eat the supplements, rather than distribute them to other members of the family. After all the women in the study give birth, their offspring will be followed up to see whether maternal diet has influenced their intelligence.

Such a study is not only extensive, but expensive. (The National Institute of Child Health and Human Development is picking up the tab.) Yet it will probably take carefully controlled studies like this one to determine whether maternal diet can alter fetal intelligence under less stringent nutritional conditions than a famine. □

## Explorer 48 sensing the universe's gamma rays

The second Small Astronomy Satellite, now called Explorer 48, was launched by the Italian Government for the United States Nov. 15. The satellite was launched from the San Marco Equatorial platform in the Indian Ocean off the coast of the Republic of Kenya. Explorer 48 is devoted exclusively to the study of gamma rays (SN: 10/7/72, p. 231). Its launch was delayed for two weeks due to technical problems in both the gyro package of the launch vehicle and the telemetry encoder of the satellite itself. □