the new law will, indeed, be used as intended.

This political competition became evident at the bill-signing ceremony. Conspicuous by his absence was Sen. Edmund S. Muskie (D-Me.), chairman of the Senate air and water pollution subcommittee, which had reported out the bill in essentially the form the President signed it. An Administration official commented that the President did not regard the bill as "the Muskie bill," but rather as a composite effort that included provisions suggested by the Administration. Whoever is credited, there is no doubt the bill includes stringent provisions the Administration had earlier regarded as too tough on industry.

The most discussed such provision is the one which will require the automobile industry to install emission controls on 1975 models roughly 90 percent more effective than those on 1970 models. Under previous law, this goal had been set for 1980. The industry has protested at hearings that the necessary technology cannot be achieved in time. But Muskie and others insist that a genuine effort will produce the necessary results.

Although the auto emission standards received the greatest publicity, other provisions might have much more far-reaching effects. For example, even if the 1975 deadline is achieved on automotive emissions, unless equipment that can be retrofitted can be devised, most cars on the road for the following several years will produce higher levels of emissions. And there is no assurance that the emission controls will continue working the way they are supposed to after a car is a few years, or even a few months, old.

The bill recognizes these obstacles by establishing national ambient air standards. States and cities will have to meet them regardless of the state of the art of emission controls. The only way the ambient air standards can be met, says a Muskie aide, is through drastic curtailment of the numbers of automobiles allowed to enter central cities.

Chicago is a case in point. Illinois air quality standards now limit carbon monoxide to about 5.9 parts per million, based on an annual geometric mean of 24-hour averaging of ambient levels at any given point. In fact, levels in downtown Chicago in 1967, the last year Federal readings were taken, were about 14 parts per million, more than double the allowed level. Officials of the Air Pollution Control Office of the Environmental Protection Agency claim that calculations of carbon monoxide and other auto pollutants, based on the current emission standards, show there should have been at least some reduction since 1967. But they admit they have no empirical evidence this is so.

Under the new law, the setting of standards will be taken out of the hands of the states and given to EPA. And although the local governments will be responsible for implementation plans, there are strict criminal provisions in the law for Federal monitoring and enforcement of the standards. A further provision seems to insure that EPA will not be derelict: It provides for waiver of the concept of "sovereign immunity" (SN: 9/26, p. 273) so that ordinary citizens, or citizens' groups, can sue EPA if they feel the agency is not doing its job.

The same national standards and enforcement apply not only to pollutants from automobiles but also from industry. Many cities in the United States now have ambient levels of sulfur oxides exceeding safe levels (SN: 8/29, p. 187), despite the fact that ambient air standards have been adopted by many states and regions. Under the new law, these jurisdictions will have to formulate clearcut implementation plans to meet the new national standards. If they fail, then EPA can step in and implement them. If necessary, Federal agents may close down factories or invoke criminal provisions of the law.

EPA officials were meeting this week to work out details and to begin to formulate the national standards—at least for the pollutants for which criteria now exist (particulates, hydrocarbons, sulfur oxides, photochemical oxidants and carbon monoxide). Two sets of standards will have to be promulgated: primary ones, aimed at a minimal level of control necessary to protect public health, and secondary standards aimed at the more nebulous goal of "public welfare." States will have nine months, after hearings, to develop and adopt implementation plans for the primary standards. More time is allowed for adoption of secondary implementation plans. □

THREE-MONTH RESPITE

Supersonic transport

Sen. William Proxmire (D-Wis.), in the waning hours of the 91st Congress last week, agreed to end his anti-SST filibuster in favor of a continuing resolution for Department of Transportation funding at the previous year's level until March 30. This means that about another $50 million—in addition to the $110 million already appropriated under earlier such resolutions—will become available for the controversial airliner. The total is considerably short of the $290 million DOT wanted for the current fiscal year. In exchange for his concession, Proxmire insisted upon, and got, a promise of a clearcut up-or-down vote in both Houses by March 30. □

SOLAR SYSTEM

Through a cell of hydrogen

Hydrogen is the lightest of the chemical elements and possesses the simplest atomic nucleus. Perhaps for this reason it is the most abundant element in the universe. Large clouds of hydrogen pervade the Milky Way galaxy. Over the last 20 years astronomers have been able to make contour maps showing its density in different places.

Most of the hydrogen that has been studied so far lies at great distances from the earth. Now data from an Orbiting Geophysical Observatory satellite indicate that the solar system is in the middle of a turbulent cell of neutral interstellar hydrogen that appears to be crossing the solar system's path in space.

(The word cloud has been used to describe the local turbulence, but Dr. Gary Thomas of the University of Colorado, one of the discoverers, prefers to say turbulent cell, because, he says, "cloud" implies density, and the local cell appears to be less dense than the average of interstellar gas.)

The hydrogen cell is at least 300 times as long as the mean radius of the earth's orbit, or 45 billion kilometers. It appears to be moving from the constellation Taurus toward the constellation Sagittarius, a direction that makes an angle of about 60 degrees with the direction the solar system moves through space. After correcting for the motion of the solar system, the cell's velocity appears to be about 50 kilometers per second. Co-discoverers with Dr. Thomas are Dr. Charles Barth and R. F. Krassa of Colorado and Drs. Jacques Blamont and Jean Bertaux of the University of Paris.

The cell was discovered by its scattering of the so-called Lyman alpha emission of the sun. Lyman alpha is a particular pattern of ultraviolet frequencies given off by hydrogen atoms in the sun. The hydrogen atoms of the cell reflect it, and the brightness of the reflection reveals their presence.

The brightest spot, representing the head of the cloud, lies in the direction of Sagittarius. Observations were made at four points as the earth went once around its orbit. In these observations the apparent location of the bright spot changed by as much as 40 degrees. If the change is interpreted as being due to the change in the point of view rather than any motion of the spot itself, then the size of the change indicates the hydrogen is very near the earth, says Dr. Thomas.

The temperature of the hydrogen is estimated from the brightness of the reflections to be about 10,000 degrees K. Its density appears comparable to that of the solar wind or about one