

create the "energy security fund" intended to fund the Solar Development Bank and pay for the tax incentives. By linking the politically popular solar programs to the windfall profit tax, the White House may smooth the way for the tax bill, but in so doing may prevent implementation of the solar program until Sept. 30, 1980, too late, say many solar advocates, to benefit the delicate solar market.

Meanwhile, two similar bills have been introduced in the Senate by Robert P. Morgan (D-N.C.) and by John A. Durkin (D-N.H.). A third, by Rep. Stephen L. Neal (D-N.C.), would take effect this fall if passed. □

Neutrons not neutral about PLT plasma

In thermonuclear fusion experiments neutrons are the gauge of success. If the experiment is an attempt to produce the fusion of a deuterium nucleus with another deuterium nucleus, it is the neutron left over after formation of a helium-3 nucleus that comes away bearing energy. Thus it is the neutrons from which a practical reactor will somehow have to extract the energy; but meanwhile it is the neutrons that bring evidence that fusions have occurred and that the experiments are on track toward ultimately making enough of them for practical purposes. □

In recent years one sort of fusion experiment, the kind that implodes pellets of deuterium fuel with laser light, has been having a kind of box score competition over the number of such thermonuclear neutrons it can produce. Now, in the June 14 NATURE, comes the first report of thermonuclear neutrons produced by the other kind of fusion experiment, the sort that confines a plasma (ionized gas) in a vacuum chamber with magnetic fields. The particular experiment is the Princeton Large Torus. Its success is reported by J.D. Strachan and nine others from the Princeton Plasma Physics Laboratory.

In the PLT experiment a plasma of ionized deuterium is held in a toroidal-shaped chamber. The experimental procedure is to try to heat it to the temperature at which fusions will occur between the deuterium ions. This is done first by electrical means and then by shooting beams of energetic neutral atoms, either hydrogen or deuterium, into the plasma. When the neutral beam was hydrogen, neutrons came out that showed, by their momentum characteristics, that they came from fusions by deuterium ions in the plasma. This is taken to indicate that the hydrogen neutral beam is indeed heating the bulk ions in the plasma. The neutral beam technique has been the beneficiary of much effort and money on the supposition that it would do just that, so the result is a heartening one. □

The sudden appeal of synthetic fuels

As gas lines slowly wend their way through Washington, a flurry of synfuel bills are being driven through the House and Senate in a race to beat the July 4 recess, when Congress goes home to face gas-hungry constituents. At last count there were 40 bills making the committee rounds. One has already been approved by the House.

Synfuels are produced from coal, oil shale and grain. The emphasis is being placed on coal because of its great abundance, but shale oil recovery and alcohol from grain are also being considered.

Price tags for some of these initiatives are high. The cheapest is the House-approved package sponsored by Rep. William Moorhead (D-Pa.), asking for \$2 billion to produce 500,000 barrels of synfuel a day by 1985. Higher priced is the bill sponsored by Rep. Carl D. Perkins (D-Ky.), who wants \$205 billion, almost twice the national defense budget.

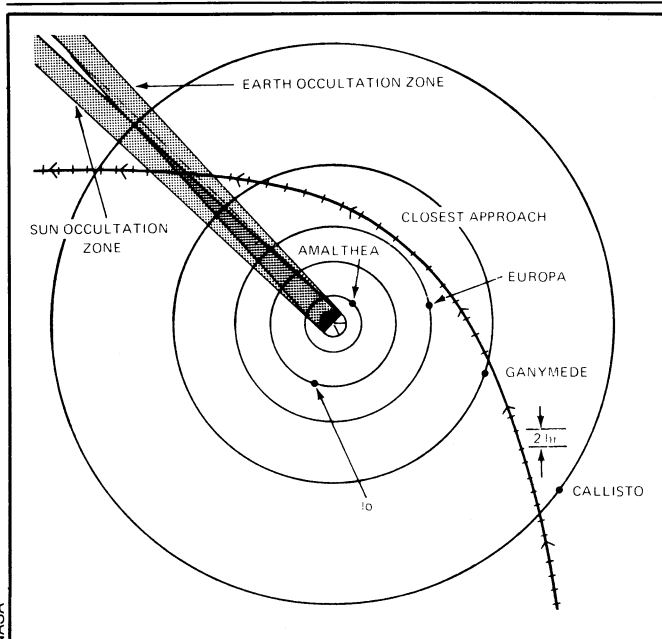
The Moorhead bill provides loan guarantees to prospective investors and price subsidies (once the synfuel is on the market) to make up the difference, should gasoline prices be less than synfuel prices. If oil prices rise as they are expected to, the price subsidy may not be necessary, so any cost-cutting on the Senate floor will involve the loan guarantees. Meanwhile, House Majority Leader Jim Wright (D-Tex.) is pushing for a more ambitious goal: two million barrels of synfuel per day in ten years, costing \$3 billion to develop.

In the Senate, Henry Jackson (D-Wash.) is backing a measure that would authorize almost \$5 billion for synthetic fuel demonstration plants. But synfuel proponents particularly like his provisions to waive some environmental laws and regulations. This "fast track" approach is drawing support from industry and could become a part of the final congressional synfuel package.

During a hearing at the House Commerce subcommittee on energy last week, committee member Albert Gore Jr. (D-Tenn.) said, "I think that we've got to move very swiftly [on synfuels]... we need nothing less than an 'Apollo project' kind of commitment to it." But testimony from witnesses who would be potential synfuel producers indicated that although the technology is not new, the soonest a new plant could begin production is in five years. S. David Freeman, director of the Tennessee Valley Authority, said synfuel is "part of the long-term answer... and in my opinion, not the most important part." Conservation would be more immediately effective, he said.

Most witnesses agreed that two of the five years needed to put the first plant on line would be taken up in satisfying environmental regulations. Committee

Voyager 2 nears Jupiter



The Voyager 2 spacecraft is alive and busy as it approaches its July 9 rendezvous with Jupiter and the planet's five innermost moons. It has already taken several thousand photos, and will soon be reexamining Jupiter's ring, Io's volcanoes and other phenomena discovered during the March flyby by its predecessor, Voyager 1 (SN: 5/5/79, p. 294). In the encounter trajectory diagram at left, the satellite positions are shown as they will be at the time of the spacecraft's closest approach to Jupiter.

VOYAGER 2 CLOSEST APPROACHES

Target	Date	Time (PDT @ spacecraft)	Distance (km to target center)
Callisto	July 8	0521	214,993
Ganymede	July 9	0014	62,233
Europa	July 9	1051	205,807
Amalthea	July 9	1301	558,531
JUPITER	July 9	1529	721,754
Io	July 9	1617	1,129,813

chairman John D. Dingell (D-Mich.) suggested to William Drayton Jr. of the Environmental Protection Agency that some "EPA red tape" could be eliminated. But Drayton answered that highly toxic materials are produced by coal gassification and liquefaction and by shale oil recovery, such as phenolic compounds and other polynuclear compounds, which have been connected to high rates of skin cancer and lung cancer in persons living nearby. Shale oil recovery will mean large-scale surface coal mining, and spent shale leaches pollutants into ground water. Coal gassification and liquefaction generate "significant quantities" of sulphur and nitrogen oxides. Therefore, Drayton said, the EPA is in the process of thrashing out environmental requirements for new synfuel plants. And, he advised, "It would be very pennywise not to invest in a technology which is showing a tendency to be carcinogenic." □

HEW funds fetoscopy

Fetoscopy is frontier perinatal medicine. It consists of an obstetrician inserting a hollow tube into the womb of a pregnant woman, visualizing a blood vessel in the fetus in her womb through the tube, then extracting a sample of blood from that vessel with a needle inserted through the tube. The blood can then be analyzed for the presence of certain genetic blood diseases, notably sickle cell anemia or Cooley's anemia (SN: 5/22/76, p. 325). Fetoscopy may eventually even lead to the direct treatment of diseased fetuses in the womb.

Consequently, based on the unanimous advice of the U.S. Department of Health, Education and Welfare's Ethics Advisory Board, HEW Secretary Joseph A. Califano Jr. has decided to permit HEW funding of research to assess the safety of fetoscopy. The first study to be so funded will be conducted at the Charles R. Drew Postgraduate Medical School in Los Angeles. It will involve pregnant women who have already decided to abort their fetuses. □

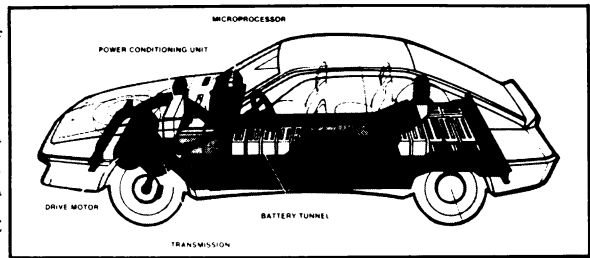
Laetrile and the law

Last year, the 10th U.S. Circuit Court of Appeals in Denver ruled that physicians throughout the United States should be able to give the purported cancer drug Laetrile to terminal cancer patients (SN: 7/22/78, p. 55). Their reasoning: Although Laetrile has not been approved by the U.S. Food and Drug Administration for safety and effectiveness, FDA safety and effectiveness laws do not apply to terminally ill patients.

Now the Supreme Court, nine to zero, has overturned that decision, reasoning that to deny the FDA authority over Laetrile for the terminally ill would be to deny the FDA authority over all drugs, however toxic or ineffective, for such patients. □

DOE unveils electric car

The Department of Energy's new electric car has a range of 100 miles at 45 mph on one charge and accelerates from 0 mph to 30 mph in 9 sec. Powered by 1,143 lbs. of 6-volt lead-acid batteries, it is by no means the fastest or longest range electric car. But DOE says it is the safest.



DOE

Health hazards of drugs in animal feed

For the past two years the Food and Drug Administration has attempted, for human health reasons, to ban certain drugs from livestock feed where they are used to increase the animals' weight gain and the feed's efficiency (SN: 9/3/77, p. 151). Now an Office of Technology Assessment report, requested by the Senate Committee on Agriculture, Nutrition and Forestry, backs up the FDA's arguments for limiting use of those drugs.

Two human health problems are involved. One is that residues of drugs shown to cause cancer in laboratory animals may find their way into the human food supply. The greater problem, according to the OTA report, is that the antibiotic feed supplements increase the ability of disease-causing bacteria to resist modern drugs. Widely used antibiotics, such as penicillin and tetracycline, thus become less effective in treating patients.

The proportion of bacteria resistant to one or more drugs has been increasing both among bacteria sampled from natural bodies of water and from human patients. In 1975, for instance, 9.2 percent of the disease-causing *Salmonella* bacteria isolated in hospitals were resistant to six or more antibiotics, compared with 0.8 percent in 1967. It is not known how much of the effect is due to antibiotics in animal feed and how much is due to therapeutic use of the drugs. However, 40 percent of all antibacterial drugs produced are used for animal feed, and animals and humans can exchange drug-resistant bacteria, so the OTA report concludes that drugs in animal feed are a significant contributor to the increase in resistant bacteria. The FDA would not ban tetracycline in cases for which there is no available replacement, but according to the report most of the drugs could be replaced with alternatives approved by the FDA.

The financial impact of limiting drug use in animal feed is as difficult to predict as are the adverse health effects. The drugs are believed to promote growth primarily by suppressing organisms that cause low-level disease, and estimates of weight gain in cattle fed antibiotics suggest increases of 1 to 6 percent. Effectiveness, however, varies with the type of antibiotic, the type of animal and the animal's health.

Even if more precise measurements of value and risks were available, the policy issues would still be complex. The report says, "No common denominator is generally acceptable for comparing human illness and death with pounds of meat." The trade-off, according to the report, is between immediate economic benefits and future health risks. But the OTA warns: "Once significant effects on human and animal health do become widely observable and quantifiable, it may be too late to address the problem." □

Skylab maneuver succeeds

Ground controllers at the NASA Johnson Space Center in Houston last week succeeded in a maneuver that may have given them a last-ditch chance to influence where the Skylab space station falls to earth in mid-July. The maneuver (SN: 6/16/79, p. 387) reoriented Skylab into a position calculated to hold the craft stable against the drag of the atmosphere; at the same time, it enabled the option of shifting Skylab back to a lower-drag position (if equipment breakdowns do not render it uncontrollable) that would slow its descent with a few hours to go. This would let the controllers delay the craft's final descent from one to three orbits if they determine—probably with no more than half a day's notice—that its last orbit is likely to be over a relatively heavily populated "ground track." In that case, delaying the descent might allow Skylab to be held aloft until it is over a more sparsely populated path. NASA estimates that the population beneath the orbit varies from five million to 158 million people as the plane of the orbit shifts relative to the earth.

On Sunday, an out-of-sequence computer command caused Skylab to drift out of its stable position for several hours, wasting some of its supply of attitude-control gas, until corrected commands brought it back under control. Agency officials say that there is probably enough gas left for the possible final maneuver, although other factors (such as incomplete tracking-station coverage at the time the maneuver must be performed) could prevent it from being attempted. □