Energy: the czar from Wall Street takes over

With its accustomed style and grace, the White House last week abruptly recycled its energy policy czars, amid growing outcry that the Administration was neglecting supplies of fuel and petroleum raw materials to providers of vital goods and services, including health care.

John A. Love, who resigned as governor of Colorado to head the White House Energy Policy Office, suddenly found himself and his office placed under a new agency, the Federal Energy Administration, to be headed by Deputy Treasury Secretary William E. Simon, whom Love had earlier replaced as the Administration's chief energy spokesman. Surprised and angered, Love and his assistant Charles G. DiBona promptly resigned.

Effects of the change could not be immediately determined, but Love had come under increasing criticism of late for alienating necessary allies and being generally indecisive (SN: 11/17/73, p. 308). Simon, a millionaire Wall Street investment banker, brings to his new job a reputation for being a no-nonsense "headcracker."

In addition to the well-publicized problems of how to apportion gasoline and heating oil fairly, Simon will soon have to face the more subtle, but potentially more dangerous problem of how to choose which specific petroleum users will be granted highest priority in order to keep the nation's goods and services flowing. Already, serious dislocations are appearing:

- Shortages have developed in the high volatility petroleum distillates, such as benzene and toluene, needed to produce pharmaceutical products. (Gasoline and heating oil—the so-called "middle distillates" that are volatilized at medium temperatures in oil refineries—are the only products subjected to special control so far.) The high volatility distillates are used to make everything from drugs and chemicals needed by doctors to the disposable tubes that carry blood during transfusions. Any decrease of these products could seriously affect health care in the country and already hospitals are scrambling to find substitutes.

The growing black market in benzene also helps illustrate what problems may be faced in other petroleum products shortly. SCIENCE NEWS has learned that some American pharmaceutical companies are having to purchase, from abroad, benzene produced in this country and sold abroad at higher prices. By the time the benzene makes the return trip, its price has more than tripled.

- The steel industry complains that it is using oil and natural gas at "an irreducible minimum," and that steel shortages have already begun to appear. Ironically, the shortages are appearing in precisely the areas that need steel in order to help the nation gain energy—drill bits, rail car wheels, roof and wall bolts for coal mines. A "serious shortage" of baling wire has been reported which could mean higher meat prices next year if hay can't be baled before it rots. So serious is the shortage of well casing and drill pipe for new oil wells that some oil companies are reportedly stripping old wells to recover the needed materials.
- The tourist industry may seem an expendable "frill" to some people, but some states are virtually unable to survive without it. Hawaii takes in $800 million a year from tourists; in Vermont, skiing alone is a $63 million a year business supporting 4 percent of the work force. The Department of Commerce already predicts a nationwide unemployment rate of between 8 and 14 percent next year, but some states will be hit much worse than others.

At his first press conference, Simon handled himself with aplomb. A firm decision on rationing, he said, would come by the end of the month. He had been assured direct access to the President—something John Love complained he lacked—and in a new spirit of openness, he promised weekly press briefings. Simon said he had not heard of the problem with high volatile distil-

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observing Jupiter's decametric radiations by radio telescope at the University of Colorado at the time, saw no signs of change.

The magnetic field of the earth is often pushed inward by temporary increases in the pressure of the solar wind, but the change is seldom more than 5 times the radius of the planet. Pioneer had apparently been passed by just such a push, except that the solar shove had covered at least 50 Jupiter radii.

Back in the stream again, the spacecraft flew on, yet the dipole remained elusive until, at last, on Sunday morning, with 30 radii to go, its traces finally appeared. A regular, ten-hour cycle became clearly visible, and the numbers of protons began climbing about 800 percent per hour, becoming almost as numerous as the electrons that had formerly outnumbered them 100 to 1.

As the planet loomed larger in the spacecraft's "camera," an imaging photopolarimeter transmitting hundreds of views of Jupiter and three of its twelve moons, concern for radiation damage became increasingly evident. "Everybody's really holding their breath," said Wolfe, barely an hour before the spacecraft would reach its nearest point to Jupiter. "It's going to be a cliff-hanger all the way to the end."

And so it was. The mysterious protons cannot be predicted or even reliably estimated from earth, and Jupiter had already shown countless unforeseeable surges that made extrapolations from measured data a risky business.

But, by the skin of its teeth, Pioneer 10 survived. Proton levels jumped by 2,000 times in less than 200,000 miles. One astrophysicist estimated that it could not have gone even a half a radius closer to the giant planet, and Wolfe's survival announcement was met with cheers from hundreds of assembled had been hope that some of the moons newsmen, scientists and VIP's. There particularly, Io, would sweep the deadly protons out of the way. Early analysis could not reveal whether the moons had made the difference. During its flyby, Pioneer was exposed to a radiation dose of some 500,000 rads, a thousand times the amount usually fatal to man.

Infrared measurements revealed an average global temperature of about 133 degrees below zero centigrade, along with yet another mystery: the apparent lack of a significant temperature difference between the planet's day and night sides. The moons Ganymede (recently discovered to show apparent traces of an atmosphere) and Callisto showed respective temperatures of minus 145 and minus 163 degrees centigrade.

Early signs were that Jupiter's magnetic field is about 4 gauss at the surface, some eight times as strong as earth's. The axis of the dipole appears to be tilted about 10 degrees, although it is apparently not far displaced from the planet's center. This is convenient for theorists although it seems to negate the radical southward displacement proposed by Warwick (SN: 5/19/73, p. 326).

The major outstanding question was whether Pioneer 11, following along a year behind its predecessor, could safely be retargeted toward Saturn, a maneuver which would require a much closer pass to Jupiter—about 25,000 miles—for a gravity-assisted swingaround. Certainly it could not survive such a near encounter at the near-equatorial magnetic latitude of Pioneer 10's path. The swingaround, however, would take the spacecraft past Jupiter at a much safer, more radiation free location, 45 degrees to the south of the equator.

The decision, or at least the confirmation of its possibility, awaits more refinement of the data. □

lates, but his newly appointed assistant, John Sawhill, told SCIENCE NEWS that some sort of controls on these products were likely in the near future.

Controlling fuel oil and gasoline so that the average person can continue his lifestyle relatively unaltered has clearly been the Administration aim thus far in energy planning. Now the policy makers must clearly turn their attention to the more complex issues of petroleum shortages, for no political gain can be gathered by assuring everyone enough gasoline if they have no jobs to drive to. Telling the real necessities from waste will be a tough job. □

Double, double, redshift trouble

The war of the quasar (QSO) redshifts has suddenly escalated. The question at issue is whether the quasars are indeed as far away as the redshifts in their light would indicate. If the redshifts are entirely due to recession velocities—and therefore by the expanding-universe hypothesis, distance—the quasars are at cosmologically interesting distances.

The large majority of astronomers has accepted the idea of cosmological distance, but as E. Margaret Burbidge, director of the Royal Greenwich Observatory points out in the Nov. 23 NATURE, "A small minority of workers have maintained a skeptical attitude toward the hypothesis that the QSO redshifts are cosmological in origin, produced by the expansion of the universe." In the same issue of NATURE appear two pieces of evidence supporting the noncosmological side. In one case quasars are found in apparent spatial relationship with groups of galaxies, but have redshifts very different from the redshifts of the galaxies. In the second case a pair of quasars is found apparently related to each other but with highly discrepant redshifts. Associated objects should be at the same distance and have the same redshift if all redshifts are due to distance.

Burbidge points out that with these results "astronomers seem at last to be within shooting distance of making some crucial tests." She attributes this ability to improvements in the accuracy of determining the positions of radio sources which enables closer comparison with the locations of optical sources.

Previous workers have found some quasars related to galaxies, but the work according to Burbidge either was concerned with bright galaxies and bright quasars or suffered from a bias in favor of the cosmological hypothesis since the redshifts of the quasars chosen for study were known and the galaxies that were looked for were chosen to be faint enough to be at the same distance as the quasars' redshifts would indicate.

The current work, a collaboration of radio astronomers (C. Hazard of Cambridge University and D. L. Jauncey of Cornell University) and optical astronomers (W. L. W. Sargent of the Hale Observatories and J. A. Baldwin and E. J. Wampler of the Lick Observatory) is more general in that it looked at fairly faint objects and avoided bias. The group searched for faint galaxies in the neighborhood of a number of blue starlike objects. It was not known in advance whether the blue objects were actually quasars nor what their redshifts were. Starting with 280 radio sources the observers looked for blue objects that could be associated with the radio sources and then looked for nearby galaxies. They come up with four cases in which strong arguments can be made for association of quasars and galaxies with discrepant redshifts: the radio sources listed in the fourth Cambridge catalog as 4C24.23, 4C11.45, 4C11.50 and 4C26.48.

Even more telling perhaps is the discovery of a pair of quasars that are only five seconds of arc apart. (This was done by Hazard, Wampler and Baldwin, and W. L. Burke, and L. B. Robinson of the Lick Observatory.) The redshift of one of the pair is 0.4359; the other's is 1.901. "Our observation of a close pair of QSO's with discordant redshifts is unlikely under the cosmological hypothesis," the observers conclude.

A very curious point is that the apparent wavelength of a given line in the spectrum of one of the quasars is almost exactly twice the wavelength of the same line in the other quasar. "This difference . . . is either an unfortunate coincidence or a profound mystery." The mystery may be, says Wampler, some unknown mechanism that splits photons. If photons can be split, the principle of conservation of energy would require doubling the wavelength. Thus the lower redshift could be due to distance. The difference between it and the larger one would come from photon splitting. But Wampler characterizes the idea as very far out, and cautions against making too much of it. "It's just that two is a number that makes people sit up and take notice," he says, whereas 1.69 or 2.5 would not.

Counterattack on infectious cancer

In June 1971 Nicholas J. Vianna of the Center for Disease Control in Atlanta and Peter Greenwald and J. N. P. Davies of the New York State Health Department reported that Hodgkin's disease—a form of cancer that attacks the body's lymphatic system—may be an infectious disease condition with a carrier state and a long incubation period. They noted a cluster of 31 cases of Hodgkin's among the 1954 graduating class of an Albany, N.Y. high school (SN: 6/19/71, p. 421).

Earlier this year other investigators found there were 18 times as many cases of Hodgkin's in Darby, Ohio, as are present in other areas of the United States (SN: 2/10/73, p. 85). Then in September Vianna and Adele K. Polan found another apparent cluster of Hodgkin's disease among teachers and students on Long Island (SN: 9/29/73, p. 206).

All this evidence is disturbing for several reasons. For one, it has had a tragic impact on some patients with Hodgkin's disease. As a result of the 1971 report, many Hodgkin's disease patients were ostracized by friends and relatives; some even lost their jobs. One patient at the National Cancer Institute in Bethesda killed himself, an institute official said, because "he couldn't bear the idea of infecting his family." The evidence is also disturbing in that it is epidemiologic. Epidemiology deals with the incidence, distribution and control of disease in a population; it is one of the shakier modes of medical science. So epidemiologic evidence that Hodgkin's disease is infectious may not be correct.

In fact, M. C. Pike of the University of Southern California School of Medicine in Los Angeles is convinced that the evidence is not correct, and he said so last week at an American Cancer Society—National Cancer Institute conference on virology and immunology.

In his look at the Albany study, Pike checked 91 Hodgkin's disease patients in Oxford, England, and found that 54 of them had the same types of links to each other that the Albany patients did. But he went a step further than the Albany researchers. He took as controls 66 patients with other diseases that are known not to be contagious. Those people were also found to be linked to each other.

"There is no evidence," Pike concludes, "that Hodgkin's disease patients know each other more than anyone else knows each other. The trouble is we all know too many people. I don't think that we have any feeling about how many people we know." □