

buying work. Representatives of government agencies as well as various citizens groups testified last week.

U.S. Comptroller General Elmer Staats told the Senate millions of tax dollars could be saved annually if generics rather than brands were used to fill welfare prescriptions. Between 1964 and 1966 emphasis on generic prescribing for Veterans Administration patients saved \$1 million.

At the same time, however, he



Sen. Nelson: price-fixing investigator.

pointed out that all VA drugs are subjected to rigorous quality tests before they are used.

In a strong attack on drug houses as the "last of the robber barons," another witness called on the Senate to "restrict the greed of the drug industry." William H. Haddad, one-time associate director of the Office of Economic Opportunity, said the government and the public are being cheated. He suggested that the FBI investigate pricing practices of certain drug companies.

International price discrepancies were the target of testimony from New York State Comptroller Arthur Levitt who criticized an American firm for charging Americans up to five times the world price for Thorazine, a tranquilizer that dramatically calms the mentally ill. Americans pay \$6.06 for Thorazine tablets Londoners and Parisians buy for \$1.08 (see chart).

The manufacturer, Smith Kline & French, argues that drugs, like everything else made in a foreign country, generally cost less than the same product made by American labor.

No representatives of the drug industry have been slated to testify as yet; U.S. Attorney General Ramsey Clark has asked the subcommittee to

postpone industry testimony. He doesn't want publicity to influence the course of several price-fixing conspiracy cases now in court.

In June, the Nelson subcommittee will hear other witnesses, including Harvard pharmacologist Richard Burack, author of "The Handbook of Prescription Drugs." Dr. Burack's book, which sparked the hearings, is advertised as a guide to generic buying.

Patent Reform Slowed

In the face of growing opposition to the Administration's patent reform bill, committee spokesmen on both sides of the Capitol are predicting no action in this session of Congress.

As hearings continue, opposition to the major features of the bill is crystallizing. The American Patent Law Association has come out specifically against the proposal that patents be issued to the first person to file an application, instead of the present first-to-invent system. Similar action was taken two weeks earlier by the Patent Section of the American Bar Association.

The lawyers' objections represent by and large the viewpoint of private inventors and small companies. Major companies with important international trade are more likely to go along with the change to the first-to-file system, which would bring the U.S. into line with most foreign patent systems and help to ease the multiple-filing problem.

Along with objections to the first-to-file proposal, the law groups also oppose the proposed elimination of a year's grace period. Under present law, an inventor has a year to try out his invention before applying for a patent. If someone else publishes the same invention or gets a patent for it, the original inventor also has a year to claim that he came up with the idea first. If he proves it, the patent goes to him.

The proposed law eliminates the grace period, and substitutes a preliminary application provision. Under this system, the inventor, for a small fee, could send in an informal technical description of his invention, establish his early filing date with that, and within a year make a formal application for a patent if the idea develops. This would save money, since only inventions that were worth following up would require the several hundred dollars in lawyer's fees that a formal application costs.

The patent lawyers say there are two things wrong with the preliminary application system:

- Even though informal, the pre-

liminary form would have to describe the invention completely in order to cover the inventor in establishing an early date for filing. This means, they say, that a lawyer should draw it up, involving a high cost for the preliminary form and another for the formal one.

- Many an inventor tries out his product first. If it's a financial success he approaches a lawyer to seek a patent. Under the present law, he has a year to do this, but the proposed law would mean he could get no patent.

These pretested inventions would be patentable under an amendment to the Administration bill proposed by Senator Edward V. Long (D-Mo.). This amendment would grant a "personal" grace period, during which the inventor could first publish or try out his invention without risking his patent.

Patent Commissioner Edward J. Brenner is prepared to accept the Long amendment as a compromise.

But the Patent Law Association remains adamant. It feels that both the full grace period and the first-to-invent provisions are essential to the patent system.

Ph.D.s for NASA

In its present time of trial, the national space agency could hardly hope to see its massive budget of more than \$5 billion get through Congress unscathed.

Yet the first real blast of displeasure from cost-cutters on the House space committee—together with an unrequested gift of \$10 million—was directed not at the National Aeronautics and Space Administration's rich tastes but at one of its few efforts to save money.

NASA proposed to trim its Sustaining University Program, started in 1962 to provide an increased supply of Ph.D.s for the space effort. The program's appropriations are divided among training, facilities and research. Since its peak year of fiscal 1966, however, when the agency gave it \$46 million, it has been receiving less and less backing, particularly in the training area for which it was originally intended.

The research portion of the SUP's budget dropped only slightly from \$12.86 million in fiscal 1966 to \$11 million the following year, and to \$10 million in the current request. But the allotment for Ph.D. training has fallen from \$25 million to \$7 million.

"The policy to phase out the program has been made without any firm knowledge, but merely the hope that programs of the National Science Foundation, the U.S. Office of Educa-

tion and others will fill the gap and satisfy the nation's future need for such highly trained manpower," according to the House Subcommittee on Space Science and Applications.

As a result, the Subcommittee recommended, and the full Committee endorsed, and added \$10 million to NASA's request of \$20 million for the program, together with an admonition by Subcommittee chairman Joseph E. Karth (D-Minn.) that NASA's reasons for the cutback offer "an illogical and totally unacceptable way to make policy."

The additional \$10 million cannot be earmarked especially for Ph.D. training in the basic House appropriations bill, but the Committee hopes that Congress will state that the additional funds may not be reprogrammed or diverted to other purposes.

The manned spaceflight program has not been faring so well. The Committee chopped almost \$47 million from the \$3.4 billion authorization requested by NASA, with the biggest cut—\$25 million—coming from Apollo.

It has also made \$61 million worth of cuts in NASA's space science and advanced research budget requests. Biggest chunks were \$15.9 million for physics and astronomy and \$14.4 million for launch vehicle procurement.

Altogether, then, the space agency finds itself faced with a minimum of \$108 million in cuts, plus the estimated \$75 million cost of refurbishing the Apollo program, all in a plan that NASA head James Webb has (as usual) termed an "austerity budget." And there may be more hard times coming on Capitol Hill: the Senate has not got its licks in yet.

Milky Way: Old

Astronomers and other scientists assume that the Milky Way galaxy, and the universe at large, were initially composed of pure hydrogen, by far the most abundant element in the universe.

One point at issue has been how much of this hydrogen is in an atomic state, how much is molecular. Only the atomic form has so far been detected.

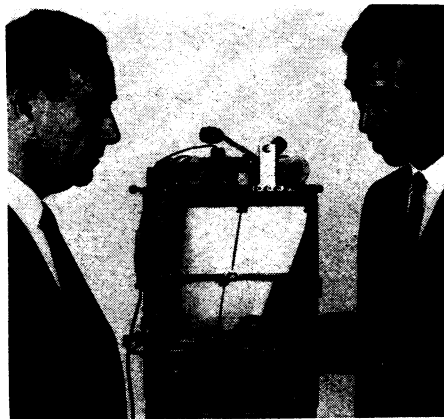
The molecular form is believed to be the one from which stars are born, but whether it was more, or less, abundant than the atomic was not known.

Now Naval Research Laboratory scientists have found that molecular hydrogen is only a minor constituent of the interstellar gas from which stars condense "like clouds forming from coalescing raindrops," at least in the Milky Way.

This means that the galaxy to which earth belongs is an old-timer as galaxies go; that most of the star formation possible in the Milky Way must have already occurred.

Only in the extreme ultraviolet and from heights greater than 100 miles above the ground can the characteristic absorption line spectrum of molecular hydrogen be observed. In the NRL experiment, 14 stars were scanned with an image intensifier spectrograph, carried aloft by an Aerobee rocket from White Sands, N. M., on March 16.

The spectrograph, designed by Dr. George R. Carruthers, detected the shortest ultraviolet radiations yet observed from distant stars. The instrument is 30 times faster than conventional photographic devices. The ex-



Naval Research Laboratory

Drs. Friedman and Carruthers

periment was under the direction of Dr. Herbert Friedman (see p. 504).

For two of the stars, the observations extended well into the wavelength region—from 1,000 to 1,150 angstroms—where the absorption bands of molecular hydrogen are expected, but no bands were detected.

If the amount of molecular hydrogen in space were as much as 10 percent of atomic hydrogen, the bands would have been seen.

Only half the matter of the Milky Way galaxy is contained in visible stars, including those that can be seen with the largest telescopes. The other half is distributed as hidden matter—invisible stars, a thin sprinkling of dust (about 100 grains per cubic mile) and huge clouds of gas, composed primarily by hydrogen.

The NRL flight was also significant because it marked the first successful attempt to use an electronographic image converter for observations in space (SN: 1/14). The NRL instrument, which had a six-inch collecting mirror, was equivalent in detection efficiency to a 36-inch telescope using the fastest photographic plates.

Study of Tropic Seas

Establishment of a multimillion-dollar Tropical Marine Science Center in either Miami, Fla., or Mayaguez, Puerto Rico, is being studied by the Associated Universities, Inc. for the National Science Foundation.

Results of the study should be presented to the AUI directors in mid-July.

AUI officials making the study are looking at a possible site on Virginia Key in Miami's Biscayne Bay. The site would be almost next door to the recently-approved location of the East Coast Oceanographic Facility of the Environmental Science Services Administration.

There, the center would also be flanked by the University of Miami's Institute of Marine Science, the Tropical Atlantic Biological Laboratory of the Bureau of Commercial Fisheries and the Miami Seaquarium.

The Mayaguez location, which would have easier access to the tropical waters to be studied, is also a developing center of science. In the town are the Institute of Marine Science of the University of Puerto Rico and the Puerto Rican Nuclear Center, an Atomic Energy Commission-financed laboratory having a strong biological program.

Orbiter Struggles On

The Lunar Orbiter program ranks with the most successful in U.S. space history. Four of the five planned spacecraft have been launched so far at the intended three-month intervals with no practice shots, and all four have worked successfully, sending back photos of the moon's surface taken from as close as 28 miles away.

The first three Orbiters were hunters, sent to seek out suitable landing spots for the Apollo astronauts (SN: 1/28). On May 4, Orbiter 4—a mapper—was launched. Its polar orbit around the moon, the first of its kind in the series, positions it to photograph 95 percent of the lunar surface, thus providing valuable information for future missions that will go outside the limited landing area of Apollo. Instead of flying close to the surface of the moon, Orbiter 4 is in an elliptical orbit that gets no closer to the moon than 1,560 miles.

Despite troubles, Orbiter 4 has been doing its job. Several photos of the moon's south polar area include thousands of square miles that have never been photographed before. One striking lunar feature found by the spacecraft is a vast trench, 150 miles long and up to five miles across. Al-