

benefits of the drugs against the possibility of side effects. But FDA has argued in the past that it should have direct power over efficacy on the grounds that any ineffective drug, even without side effects, is harmful since its use deprives a patient of treatment by another, perhaps more effective, drug.

The AMA argued that the FDA's powers should not be broadened, on the grounds that it is only through wide use that a clear idea emerges of the value of a new drug, and that there should be more cause for concern over keeping a possibly useful drug off the market than of allowing a useless drug to be sold. The AMA argued that it is just beginning an extensive program to keep the profession better informed on the latest evidence on the effects of new drugs, alleviating the need for government action in this field, and that except in very clear-cut cases, no one, not even the government, should have the power to interfere, as by keeping a drug off the market, with the judgment of the doctor as to what is the best treatment for a particular patient.

Kefauver professed to be unimpressed by the AMA testimony. The AMA, in assessing the efficacy of drugs, could not, like a government agency, require the drug companies to cooperate by supplying all the pertinent information from their files, including what might be unfavorable. On a broader question, Kefauver doubted whether it was reasonable to assume that the AMA could do a proper job of policing the advertising and promotional policies of the drug industry when it was dependent on the industry, through some \$4 million annually of advertising in AMA journals, for over half its annual budget.

The debate comes down to a judgment on the degree of sanctity with which the partisans view the free enterprise system. To Kefauver, and to liberals generally, the situation in the drug industry is peculiarly offensive, both because the extra cost of drugs under the present system, although not particularly significant when viewed on a nationwide per capita basis, falls especially heavily on the comparatively small part of the population that is faced with heavy medical bills, and because of the peculiar nature of the business, in which the person who pays the bills has little chance to look out for his own economic interests since

he has no choice over what to buy: the prescription is written for him by the doctor. This led Kefauver to open the hearings by announcing that so far as he was concerned his bill was a moderate one, involving changes in the ground rules as a result of which the pattern of competition in the industry would tend to move naturally in a direction more in keeping with the public interest. The alternative, Kefauver suggested, would be direct federal controls.

To conservatives the extra cost of drugs is not significant enough to warrant another step in the increasingly large role of the federal government in the economy. They are concerned that this legislation, aimed at a particular industry, would lead to demands to change the ground rules in other particular industries. This tendency suggests to many conservatives a more intimate degree of federal interference, as opposed to the bulk of the business regulatory legislation which has grown up since the turn of the century, which tended only to lay down ground rules for business competition generally. The AMA naturally finds itself sharing the views of the conservatives, not only because the leaders of organized medicine are themselves conservative, but because their greatest political interest is in opposing the development of socialized medicine, and they cannot help feeling, probably correctly, that any increase in the federal role in medicine weakens the resistance to a national health service. This may be especially true here, for the professed aim of the bill is to alter the circumstances that make the industry's heavy investment in promotion profitable. It would make the drug business less profitable, thereby reducing the economic power of a principal political ally of the AMA. It would, if it serves its purposes, sharply reduce the amount of promotion, and this would reduce the AMA's own resources, since the AMA, in fighting the increasingly expensive battle against a government-financed health service, has come to rely heavily on the money its journals earn from drug advertising. For all these reasons a far more intense controversy surrounds the bill than a casual reading of Kefauver's bill would suggest. For the bill, on a casual reading, appears to contain nothing more than a series of minor technical changes in laws of whose existence the public is scarcely even aware.—H.M.

News Notes

Micrometeorites

Three attempts were made recently by U.S. scientists to study micrometeorites, a potential hazard to manned space flight because of the damage they may cause to space vehicles on impact. The tiny particles move at speeds of over 47 miles a second.

The Air Force succeeded in collecting what may be the first micrometeorite samples with an Aerobee-Hi research rocket nosecone dubbed the "Venus flytrap." The particles were caught in plastic traps which were exposed as the cone opened when it reached an altitude of 47 miles. The exposure was maintained during the cone's ride up to 102 miles and was cut off at 65 miles as the cone returned to earth (see cut).

Scientists from the Air Force Cambridge Research Laboratories who examined the traps said the contents showed the existence of a dense band of micrometeorites which envelops the earth somewhere between these extreme altitudes. The traps were struck by ten particles per square centimeter each second.

Two types of micrometeorite detectors or traps were used: one made up of three physically separated layers of plastic, the two top layers of Mylar film 1/4000 and 1/1000 of an inch thick, respectively, and a 1/8-inch sheet of Plexiglas; another of relatively thick films of three harder plastics, Millipore, Formvar, and Lucite. The particles passed through the Mylar film layers, leaving holes, many visible to the naked eye. When they struck the Plexiglas, small craters, some also visible, resulted. Craters also were detected on the Lucite film, but most evidence of micrometeorite contact was apparent only through microscopic examination. Few micrometeorites themselves were collected since they apparently vaporized on contact with the detecting surfaces.

AFCRL scientists are interested in the residual bits of the space dust lining the walls of the craters in the plastic as well as in the meteorites themselves since it is believed the particles may provide new clues concerning the origin of the meteorites and, perhaps, the origin of the earth and the solar system. Complete anal-



Portion of the mechanism used to expose plastic traps carried in the nosecone of an Aerobee-Hi rocket which brought micrometeorite samples back to earth. Project scientists Thomas Ryan and Robert Soberman examine one of the traps. [Air Force Cambridge Research Laboratories]

ysis may take several years. It will be done for the most part by electron microscopy, which must be used because many of the particles to be examined are smaller than the wavelength of light. Study of one square inch may take a year; samples are being made available to interested and qualified scientists.

Other Shots

The Air Force followed up the "fly-trap" launch by sending up an acoustic rocket to measure the intensity of the sound of the impacts of the particles. Variations in sound intensity are recorded on tape and telemetered back to earth. These measurements will help pinpoint the altitude boundaries of the newly discovered micrometeorite band. They also will provide data that will permit a more accurate evaluation of how micrometeorite bombardment on a space vehicle may affect an astronaut. This sound has been compared with the sound of machine-gun bullets striking a metal surface. Since penetration of micrometeorites can be blocked by plastic surfaces, their damage potential may be more psychological in nature than physical.

The National Aeronautics and Space Administration tried and failed to launch a 125-pound satellite last week

to measure the impact of micrometeorites on various metals. The experiment is part of a program to prepare the way for the safe orbit and recovery of an astronaut later this year. A malfunctioning rocket was behind the failure.

The attempted launch also was another test for NASA's Scout, the first multiple-stage, solid-fuel booster. The third stage failed to ignite. This marked the Scout's second failure in three trials. Nicknamed "the poor man's rocket," the Scout is being developed for use in various space experiments which do not require the larger thrust afforded by liquid-fuel rockets. Solid-fuel boosters are easier to handle and are considerably cheaper than the huge liquid-fuel boosters. Another try with the Scout to launch a micrometeorite satellite will be made in the near future, a NASA spokesman said.

Catch in Space

The sixth recovery of a 300-pound Discoverer capsule was made in the air this week after its 50-hour, 36-minute ride in space. Launched in a polar orbit from Vandenberg Air Force Base in California, the capsule

was in the nose of the 25-foot Agena second stage of an 81-foot, 2450-pound booster, the 26th in the Discoverer series. Seven of the series have failed to orbit.

The kettledrum-shaped capsule was caught in the air on the first try by a two-engine C-119, half an hour after a ground signal had triggered its release from space on its 32nd orbit. Original plans were to have the capsule orbit for 4 days; it was called back, according to an Air Force spokesman, only because all data desired from the probe had been telemetered back. In the past, however, capsules have been recalled before completing the planned number of orbits because of loss of gas necessary for control. The time and number of orbits yield information on orbital speed, weight, mass, and ejection speeds important for planning for future recoveries.

The capsule contained the standard Discoverer package consisting of the elements iron, bismuth, yttrium, magnesium, nickel, lead, and titanium and, in addition, silicon. Silicon was included to measure the possible damaging effects of radiation on solar cells, which are a principal source of energy in many satellites. The Discoverer XXVI capsule, like all its predecessors, is gold-plated. Gold is used because it reflects heat and thus protects the capsule and its contents from possible damage from exposure to high temperature during the return to earth. It is also a good conductor of energy, and one of the scientific objectives is to measure the amount and effects of radiation.

Useful Debris

Left in the Agena still whirling in space are materials to measure cosmic and radio radiation and density of ions and micrometeorite particles. Particle density also is being measured by the erosion, by particle bombardment, of a tuned radio crystal which, as it is chipped away, will change its transmission frequency. The Agena also has a special radio receiver that transmits radio noise from space back to earth. This telemetered information is adding to knowledge of radio astronomy and will be useful in the development of communication satellites.

This is the first time extra experiments have been left in the remnants of a Discoverer shot. "Reliability of the Discoverer program has now advanced to the point where additional

equipment can be added for scientific experiments," an Air Force spokesman said.

Of the 19 Discoverers that have been put into orbit, 15 have carried recoverable capsules. Discoverer XIII was the first successful space catch.

The **Atomic Energy Commission's tunnels** in the Cactus Mountains of Nevada are ready for underground nuclear tests for peaceful or military purposes once an official go-ahead is given. On 30 Oct. 1958, a Hiroshima-size bomb was set off underground in these AEC tunnels. The next day the tunnels became inactive as a result of the gentlemen's agreement to suspend nuclear tests reached by the United States, the Soviet Union, and Great Britain. Since then, however, tunnel development has continued, explosion debris has been cleared away, and enlargements and improvements such as air-conditioning, lighting, and railways have been added.

Atomic experts in Great Britain are designing instruments to detect nuclear tests in space, it was reported in the British Atomic Energy Authority annual report. It should be possible to detect such explosions at distances over 625,000 miles under proper atmospheric conditions, the report said. Work also is being done in seismic research to improve the ability to distinguish between underground explosions and earthquakes.

The headquarters of the Royal Society, Great Britain's **space phone center**, set up to relay telephone conversations around the world from signals bounced off of a system of communication satellites, has been unable to get a local line. The society has to wait its turn, it was told by the telephone company. It is now half-way down a long waiting list.

Export to Czechoslovakia of 25 millicuries of carbon-14 and 100 millicuries of tritium has been approved by the Atomic Energy Commission for use in medical and biochemical research. The AEC said the materials would not be of military value.

The **United States and Poland** have signed a \$115,000 agreement to provide Polish medical students and physicians with inexpensive translations of standard American medical textbooks.

Announcements

A **World Academy of Art and Science** has been organized to "function as an informal 'world university.'" The academy states its fundamental aim is "to rediscover the language of mutual understanding . . ." and, "with the help of science and the support of all cultural forces of mankind," it hopes to "serve as an impartial and unpolitical adviser, complementing other organizations . . ." and to contribute in "leading mankind to an era of true progress, true human welfare, and true happiness." Officers of the new academy are:

Lord John Boyd Orr, chancellor of the University of Glasgow, president.

Hermann J. Muller, professor of zoology, Indiana University, vice president.

Hugo Osvald, retired professor of botany, Royal Institute of Agriculture, Uppsala, Sweden, vice president.

Hugo Boyko, ecological adviser to the National Research Council, Prime Minister's Office, Israel, secretary general.

The first volume of the academy's publication series, *Science and the Future of Mankind*, is being published by W. Junk, The Hague, Netherlands. (Hugo Boyko, WAAS, 1 Ruppin St., Rehovot, Israel)

The placement service of the American Phytopathological Society has names and qualifications of candidates available for employment in **plant pathology**. The service is free to members and is available to any employers with vacancies. (Phytopathology Placement Service, Crops Research Division, Plant Industry Station, Beltsville, Md.)

A booklet containing a survey of existing data on the use of **radioisotopes and radiation sources**, with a report by a panel of medical physicists and radiotherapists, has been published by the International Atomic Energy Agency, Vienna. A limited number of copies of *Therapeutic Dose Distributions with High-Energy Radiation* are available free of charge for scientific reviews or discussions in the press. (Division of Public Information, IAEA, Vienna 1, Austria)

The **International Atomic Energy Agency** is seeking scientific advisers for assignments in foreign countries in connection with the technical assistance program. Positions are for three, six, and twelve months. (IAEA, Vienna 1, Austria)

Scientists in the News

J. George Harrar, agricultural expert and a vice president of the Rockefeller Foundation since 1959, has been elected president of the foundation. He succeeds Dean Rusk, who resigned last January to become Secretary of State.

Ephraim Katchalski, head of the biophysics department at Weizmann Institute of Science, Rehovot, Israel, has been awarded the 1960 Rothschild prize for his work on the structure of polyamino acids.

Marvin L. Sears, of Johns Hopkins Hospital, has been appointed the first full-time chief of the section of ophthalmology at the Yale-New Haven Medical Center.

Harry D. Holmgren, of the U.S. Naval Research Laboratory, has been appointed associate professor of physics at the University of Maryland.

Recent appointments to the faculty of the New York University Schools of Medicine:

Joseph Ransohoff, Columbia University College of Physicians and Surgeons, will become professor and chairman of the department of neurosurgery.

Valentino D. B. Mazzia, Cornell University Medical College, will become professor and chairman of the department of anesthesiology.

Milton Eisler, former senior scientist in Schering Corporation's research division, has been appointed president and laboratory director of Probio, Inc., in Nyack, N.Y., a newly formed company which produces biologicals for laboratory use.

Louis C. Zopf, dean of the State University of Iowa's College of Pharmacy, has received the 1961 E. R. Squibb and Sons distinguished service award.

Erratum: In the report "Formation of diamond by explosive shock" [*Science* 133, 1821 (9 June 1961)], by P. S. DeCarli and J. C. Jamieson, the unit of measure given in line 4 of the last paragraph in column 2, page 1821, should have been degrees of geometrical angle rather than temperature.

Erratum: In the news note, "Space discoverer recovery," on page 2002 of the 23 June issue, the statement in the 4th paragraph (lines 6 and 7) that the Discoverer program achieved "the first successful orbit and recovery of animals" is wrong. The statement should have been omitted, and the following sentence should have concluded the paragraph: "The Discoverer program also marked the first attempt by the United States to put animals in orbit."