the Russian tests would, we would come off better than the Russians. But the world-wide concern over fallout is based not only on calculations of the damage it might cause, which after all is fairly small, but in large part on the revulsion against the development of more horrible nuclear weapons, of which the fallout danger is a by-product. To the extent this is true it does not follow that the world reaction against a possible Soviet resumption of fallout-producing tests would be greater than the reaction against the United States for being the first to resume testing at all, even though the U.S. tests produce no fallout. But no matter how awkward a resumption of testing may be, it remains true, as Administration officials have privately emphasized, that the decision cannot be avoided if it becomes clear that the risks of continuing the voluntary ban while the Russians may be secretly testing simply cannot be accepted.

It is in this connection that the public announcement of the organization of the scientific panel is significant, and it is a safe assumption that the review will be followed by a public report by the panel evaluating the risks of continuing the unpoliced moratorium indefinitely: in other words, the organization of the scientific panel, like the issuance of the White Paper (*Science*, 23 June) last month must be viewed primarily as a move intended to promote general understanding of the reasons for American policies in preparation for a possible resumption of testing, although the White Paper, ostensibly, was a diplomatic note to the Russians and the scientific panel is being set up, ostensibly, to produce an evaluation for the Administration. This does not necessarily mean that a decision to resume testing has yet been taken; it simply reflects the fact everyone now recognizes that there is no likelihood that the Russians are going to agree to a policed test ban in the near future, and therefore that the United States has no choice but to prepare the ground for a resumption of testing if that should prove necessary. Even if testing is not resumed, such steps as the issuing of the White Paper and the convening of the scientific panel would still be extremely useful in making clear to the world why, in our view, the Russians are clearly to blame for the collapse of hopes for reaching a formal agreement.

On the Soviet-American talks aimed at setting up the framework for the general disarmament negotiation which had been scheduled to begin 31 July, both sides promised to keep the exchanges entirely private. Although John J. McCloy, the American representative, refused, for this reason, to discuss this topic with reporters, no one who had talked with him could avoid the impression that very little progress was being made. The first phase of the negotiations ended last week. McCloy arranged for Valerian Zorin, the Soviet negotiator, to pay a call on the President, and it was announced that the negotiations would be broken off for 2 weeks, to resume in Moscow on 17 July.

Disarmament Agency

The Administration, nevertheless, followed through on its campaign commitment to organize a much-expanded Disarmament Agency. A high Administration official said that the outlook for disarmament is not very bright at the moment but "it's just as important to patch the roof when it's raining as when the sun is shining."

The draft legislation was a long way from the elaborate proposal for a Peace Agency put forth last year by the Democratic Science Advisory Committee. That agency would have pretty much taken over all research related to the world's economic and social problems, as well as its more obvious work on disarmament. The new agency, though, will still have broad research responsibilities, going beyond a narrow definition of disarmament, and, in addition, major operating functions: specifically, carrying on actual negotiations and running the control organization if and when a control agreement is signed.

The new agency will be authorized to sponsor research not only on problems directly involving disarmament and arms control, but in such matters as economic impact of disarmament and the problem of gradually developing a system of international law to provide for peaceful settlement of disputes.

A good deal of this could have been set up simply by making vigorous use of the present Disarmament Agency, which was organized last fall on the basis of a Presidential executive order. But the Administration chose to ask Congress to provide formal legislation, in part to emphasize the importance it attaches to the agency, in part to ease the way for getting appropriations for the agency through Congress.—H.M.

Salk, Sabin, and the AMA

The American Medical Association has endorsed the mass use of the Sabin oral vaccine against polio, stating that the Salk vaccine, the only one thus far licensed for use here, cannot eradicate polio in the United States. The AMA implied that the oral vaccine, still undergoing tests for safety and potency, should be given, when available, to everyone, even those who have received the full Salk series of three injections and booster.

Jonas Salk protested the implication that the oral vaccine should be given to everyone, including those who have received the Salk series, and termed the AMA endorsement "questionable and of doubtful practicality."

The AMA approval of the Sabin vaccine is the first ever given by the organization to an unlicensed product still being tested. The licensing by the Public Health Service has been delayed by uncertainties about (i) the interaction of the live poliovirus with other viruses in the intestinal tract; (ii) the possible effect of the virus on the central nervous system; and (iii) the dosage schedule for maximum effect. In addition, the PHS requires that five consecutive lots of the virus vaccines, all free of extraneous viruses or other matter, must be produced to assure continuous safety of all lots. The vaccine is produced in monkey tissue which not infrequently demonstrates the presence of other viruses, but manufacturers expect to be able to satisfy this requirement by fall.

The spread of polio in the United States has been markedly reduced by the use of the Salk vaccine. But the method of administration by injection, requiring trained personnel, as well as the time involved in getting the number of shots necessary to build up immunity, has had some limiting effect on the number of people benefiting from it. However, a significant advantage of the Salk vaccine is that it does not reintroduce live poliovirus into the population.

The oral or live-virus vaccine such as the Sabin product has been used with success in the Soviet Union, Great Britain, and in South America. The oral vaccine has been given by teaspoon in a cherry-flavored syrup. Ease in administration has meant wider and faster distribution than can be provided for Salk vaccine. The oral vac-

cine has another advantage in that it is more effective in epidemics. The type of poliovirus that may be involved in an epidemic situation can be isolated and then administered quickly and easily in the oral vaccine to those endangered. This protection cannot be afforded by the Salk vaccine. Neither product, however, is effective if administered to a person who already has been infected by poliovirus.

Space Pictures

Four photo records of the passage of cosmic rays in space, taken aboard Air Force Discoverer satellites and Atlas rockets, have been recovered, yielding data on the radiation exposure of space vehicles and on the effect such exposure may have on future travelers. The films were part of a series of rocket and satellite experiments planned by the Geophysics Research Directorate of the Air Force Cambridge Research Laboratories to try to find some clues to the source of cosmic rays and how they get their tremendous energies.

Nuclear emulsions much thicker than ordinary photographic emulsions and stacked to provide a three-dimensional pattern were used to trace the path of the rays and measure their flux. The special emulsion stops cosmic rays entering it at angles before they pass completely through, thus capturing a complete record in the form of tracks (see cut).

The first pictures were taken from an Atlas nose cone recovered in July 1959. Emulsions were carried to an altitude of 700 miles, entering the lower Van Allen belt of trapped radiation that encircles the earth. Another Atlas nose cone, recovered in October 1960, also went into the Van Allen region and also carried emulsion packages inside the vehicle near a cage containing three mice that provided data necessary to the design of shielding for astronauts. Cosmic ray tracks on emulsions carried on board Discoverers XVII and XVIII, recovered in November and December 1960, still are being studied. Those from Discoverer XVIII are providing data on cosmic radiation entering the atmosphere over the arctic and antarctic regions.

These photographic records provide detailed analyses of single events; but for over-all pictures of cosmic-ray behavior, instrumentation that does not need to be recovered is carried into space, and the data are telemetered back. Geiger counters and proton spectrometers of the solid-state, scintillation, and Cerenkov types are some of the devices flown.

Neutron experiments are being conducted to provide data on the formation of the lower Van Allen belt. It is believed that this trapped radiation consists of protons produced by the decay of cosmic-ray produced albedo neutrons. Blue Scout rockets and satellites to be launched this year will carry boron trifluoride detectors to measure neutron density at various altitudes.

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Daylight pictures of planets, rockets, and missiles, previously unattainable, may now be transmitted to indoor screens, for continuous viewing, by the Facet-Eye camera, developed at the Air Force Missile Development Center, Holloman Air Force Base, N.M. This camera has taken clear daylight pictures of Venus and Jupiter that previously could be taken only at night. Astronomers have expressed interest in the system, according to an Air Force spokesman, although it was designed primarily to make possible a 24-hour viewing of rockets, missiles, and satellites in space. An array of 19 long-barreled telescopes, each focused on the same point in the sky, is used, and the resulting images are then superimposed on one another. The magnification is as great as it would be if one large telescope were used, but the amount of stray light is greatly reduced, and this makes it possible to obtain clear images even in the daytime.

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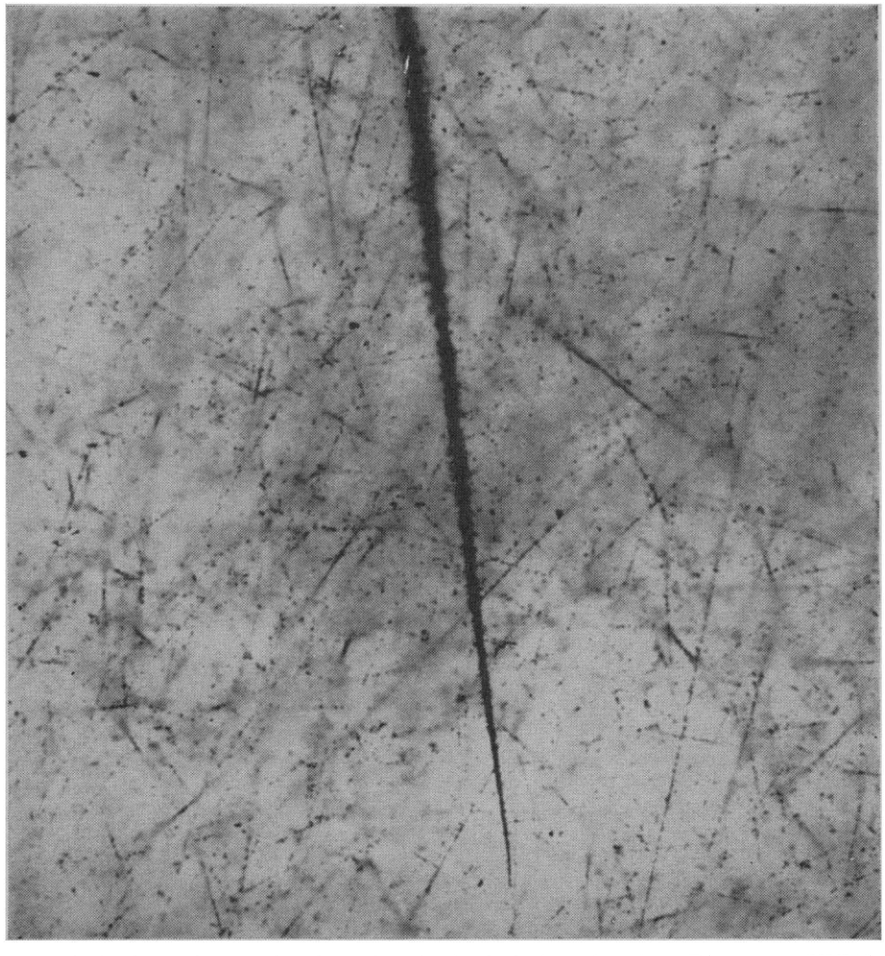
A missile-tracking ship, the *American Mariner*, carrying more than $30 million worth of radar, infrared, and optical devices, will take up station in the Atlantic Ocean to study launchings from Cape Canaveral. The 90 technicians aboard will concentrate largely on getting records of missiles returning from the upper atmosphere in order to learn more about re-entry behavior. The unarmed vessel is under the Army's operational control.



A typical photomicrograph of tracks obtained during the time Discoverer XVIII's re-entry capsule was in orbit. [Cambridge Research Laboratories, U.S. Air Force]