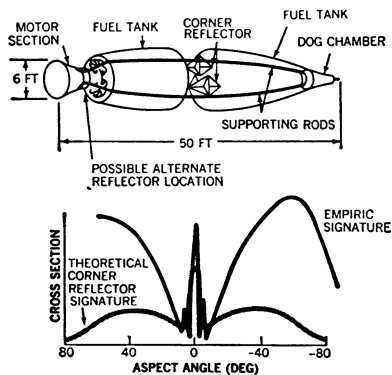


than 12,000 pounds for both the Apollo capsule and for Voskhod 2, the previous Soviet manned flight in 1965.

This means that it was far from the heaviest spacecraft ever launched by the Russians. Proton 1 and 2, described by the Soviet Union as "physics laboratories," each weighed some 27,000 pounds, and the Proton 3 mission is believed to have carried more than 60,000 pounds into orbit around the earth. This is about the combined weight of an Apollo capsule and the rocket that will carry it from its earth orbit to a lunar one. U.S. officials thus reason that a manned mission, perhaps in a Soyuz spacecraft, using the same kind of huge booster that carried Pro-



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Radar analysis pictured Sputnik 2.

ton 3, would be capable at least of making a non-landing flight around the moon.

Monitoring of Soviet communications also helps to cut holes in the secrecy screen. NORAD's tracking stations are located in Alaska, Greenland, England and Turkey, but even within the continental United States are listening posts which provide valuable information. Though there were no public Soviet announcements about trouble during the flight, one California outpost overheard a broadcast saying that Komarov fought for control of his spacecraft for three orbits before bringing it down into the atmosphere. The message said that there had been difficulties in attitude control and communications, and that the spacecraft had been using too much power.

The Russians did not announce where the spacecraft had crashed, except to say that it was somewhere in the Ural Mountains. But another listening post caught a piece of a message saying that it was near the city of Sverdlovsk, about 675 miles from the Baikonur space center from which it was launched and about 180 miles from the spot where the previous Soviet manned flight landed.

Though there is a lot of information thus unofficially available to the U.S. space analysts, there is one upcoming plum they'd like to have. Within a day

after the tragic end of the flight, Soviet space officials announced that an official review board would investigate the accident in detail. The results of the investigation, if it is indeed a rigorous one, will certainly not be made public, and if it provides the same exhaustive space program survey as appeared in NASA's report of its own tragedy on Jan. 27, the Russian report would be a prize indeed for U.S. spies.

Draft Changes

While draft legislation faces vocal opposition in Congress, the Pentagon is quietly preparing an executive order to do away with the draft deferments for graduate students.

It is not known exactly when the President will issue the order, which complies with recommendations the National Advisory Commission on Selective Service sent to the White House earlier this year (SN: 3/18), but Government officials believe it will not be retroactive.

Whether or not deferments will still be granted to undergraduates remains an open question, or a White House secret, officials say, but the President has definitely decided that when a man finishes college he should stand as much chance of being called into service as anyone else.

Social Science Study

Domestic programs have increasingly aimed at a base in the social sciences in the last five years. Poverty, crime, urban chaos, poor health and education—all will supposedly yield to a well-designed program based on social research.

The aim is fine, but the research is hard to find, a House subcommittee report said last week.

The report came in four volumes and represented the first major investigation into Federally sponsored social research. Put together by sociologist Dr. Harold Orlans of the Brookings Institution, the report charges that too much Federal research is trivial, repetitive or simply not applied to the burning domestic issues.

It also makes clear that both Government and social scientists are responsible for research whose quality and utility is questionable.

The report, however, only raises questions; it makes no recommendations. Public hearings will be held later to determine whether agencies can be prodded into action or if legislation must be proposed.

Federal support for social and behavioral research has increased five-

fold since 1960 and this year stands at \$380 million. Money is being spent not only by old line agencies, such as Health, Education and Welfare, Defense and Agriculture, but by the newer agencies—the Office of Economic Opportunity, the National Aeronautics and Space Administration, Arms Control and so forth.

Evaluations of how much good this money is doing are hard to come by, the report charges.

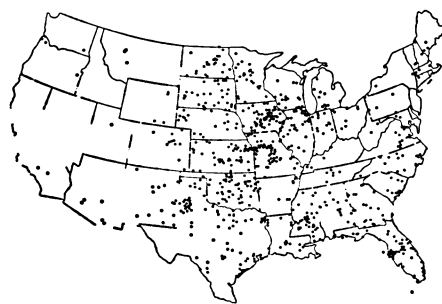
Of 21 agencies queried on the relevance and quality of their research, only two had answers of any consequence. Six others claimed they do have procedures for evaluation, but gave little information; seven did not bother to answer at all.

Besides Government agencies, the House investigators sent inquiries to well-known scientists, private researchers and foundations. Their views, published in full by the subcommittee, represent a span of opinions, from endorsement of the kind of research supported by Government to harsh criticism.

Tornadoes, a Mystery

Hundreds of tornadoes maul the surface of the earth every year, taking hundreds of lives and smashing all but the sturdiest of man's works, yet they remain one of the least understood of natural phenomena.

Those that killed more than 50 people and caused more than \$20 mil-



Tornadoes, 1966. And no solution.

lion worth of damage in Illinois alone on April 21 underscored man's total helplessness against their fury.

While meteorologists can predict with fair certainty the broad areas where tornadoes are likely to form, they can neither pinpoint the exact locations of future funnel clouds nor do anything about them once they have formed.

The best anyone can do—as was done in the eight states visited by the April 21 twisters—is issue a tornado watch, a warning to the community that atmospheric conditions are right