

Dr. Latham, in order to read deeper down, wants to make a bigger tremor.

He and the National Aeronautics and Space Administration are now discussing the possibility of crashing the ascent stage of the Apollo 12 lunar module into the moon, once it has safely carried the astronauts up to the command module waiting in orbit. The resulting impact, about 18 miles from the seismometer that the crew will leave on the surface, would provide a shock that ought to sound out the moon at least six miles down.

"It would be an extremely valuable experiment," Dr. Latham says, adding that the seismologists are learning the lunar module's weight, fuel vent rates and other characteristics in detail to get the most from the crash. "I suspect that we're going to know better than the Grumman engineers (who build it) what the LM does."

Next summer, Apollo 14 is scheduled to carry an active seismometer that will automatically throw out hand grenades to create its own shocks, but these too will be small ones, good only for about a mile down. More useful will be the network of passive seismometers that will have evolved after several Apollo moon landings. Triangulation from widely spaced sites should make it possible to track tremors at great depths.

Also planning ahead is Dr. Carroll Alley of the University of Maryland, mentor of the laser reflector that has been left on the moon for a variety of measurements, including the earth-moon distance with an accuracy of six inches.

The device has already shown that its mirrors can survive the extreme temperature changes from lunar night to lunar day without crippling distortion, and Dr. Alley is now negotiating with NASA about sending additional reflectors on Apollos 16 and 17.

A reflector near each edge of the moon's visible face, together with one near one of the poles, could enable extremely accurate measurements of the moon's librations, Dr. Alley says, as well as providing reference points for lunar mapping. ◇

ORACLES NEEDED

For technology assessment

Television was once regarded as having no future, an atomic bomb was dismissed as ridiculous, Alaska was written off as folly and the airplane was either ruled out as a freight carrier or just ruled out period.

There are many more examples of where some oracle who, in retrospect, should have known better, got his visions mixed. And in retrospect, some miscast forecasts might seem amusing.

But a growing number of people believe the world can't afford to make more technological forecasting errors. They point to air and water pollution, riots, power shortages, jammed cities and highways and social alienation as some of the consequences of not foreseeing or foreseeing inaccurately.

As of now there are professional seers who make it their business to foresee technological possibilities. But last week the National Academy of Sciences entered the lists on the negative side. It issued a report urging that the Government get into the business of forestalling some of technology's side effects.

The report, prepared by a 17-member panel chaired by Dr. Harvey Brooks, dean of engineering and applied physics at Harvard University, comes three years after a proposal by the House Subcommittee on Science, Research and Development of a Federal early warning system to spot the dangers of technology (SN: 10/29/66, p. 345). The new report sees technology assessment, the term for technological forecasting, as important enough to warrant both Presidential and Congressional attention.

The report recommends that the assessment function be carried out by the Office of Science and Technology, either as a separate Technology Assessment Department within OST or distributed within an expanded OST along other lines. This would be better than a separate commission or board along the lines of the Council of Economic Advisors, since the assessment question would inevitably be tied up with other science-policy issues which are dealt with in OST, says the report.

The new Government operation, regardless of its organization in the executive branch, would also have roots in both Houses of Congress, either as a Joint Committee on Technology Assessment or a Technology Assessment Office serving Congress as a whole.

Although acknowledging the positive contributions of technology, the report admittedly concentrates on the negative, worrying not so much about what good technology can do but how to prevent it from doing harm.

As justification for the entry of the Government into technology assessment, the report notes that, "By the mid-20th century, largely as a result of the massive Federal support of research and development stimulated by World War II, Government policy had become at least as influential as the forces of the ordinary market in setting the environment for technological change. Today the Government finances nearly 50 percent of industrial research and development and virtually every Government agency is involved in one or more programs designed to further

the development and use of some technology by providing an outlet for its goods and services, or by stimulating it at its inception, or both."

Rep. Emilio Q. Daddario (D.-Conn.), chairman of the Subcommittee on Science, Research and Development, who requested the report, says his subcommittee will hold hearings to follow up the panel's recommendations.

"**I am certain** that this straightforward and lucid report will also result in concrete action," he says. "The report shows that Congress needs the capability for independent, objective analysis of all the potentials of new technology, a capability which does not now exist. While technology assessment is a very complicated affair involving many invested interests, it can be accomplished. Congress must make sure it is."

One area the panel admits it has not covered adequately is military technology. Although not passing judgment on it, the report points out that the military's policy of keeping information secret conflicts directly with technology assessment, which must have correct and adequate information if it is to work.

PSYCHOLOGISTS MEET

Relevance in Washington

Professional meetings have repeatedly been hit hard by the demands of activists both within and without the ranks of their organizations. In May of this year it was the National Conference on Social Welfare (SN: 6/7, p. 549) and in July it was the American Medical Association meeting (SN: 7/26, p. 76). This week the 77th annual meeting of the American Psychological Association in Washington, D.C., was the target of protest and dissatisfaction.

The psychologists had made a determined effort in the direction of relevance; fully half of their sessions were devoted to pressing social issues. But it wasn't enough.

The meeting began Sunday, and the public disturbances began Monday when a small group of radicals, many of them sporting red arm bands, comprising two newly organized and loosely knit organizations—Psychologists for Social Action and Psychologists for a Democratic Society—took over a session on student unrest.

They demanded that the APA change its political orientation and get research money for really pressing problems of society. Dr. Bertram Garstoff, a radical psychologist with capital city's experimental Federal City College, told his colleagues that slowly trying to change people's attitudes isn't going to help; action is necessary.

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