

# U.S. Softens Claims on A Detection

By Martin Berger

The report has rewritten the original scientific paper, showing substantial improvements in the ability to differentiate between underground nuclear tests and earthquakes. The effect of the changes is to weaken the report's conclusions.

The findings of the original report suggested virtually to eliminate the need for on-site inspection to check suspicious to improve significantly the earth vibrations and prepare reports for negotiating a ban on underground nuclear testing, given a political decision to do so. The revised summary in effect undercuts the scientific strides that had been reported less definitive.

The original report stated that with appropriate instrumentation, earthquakes registering 4 on the Richter Scale could be differentiated with accuracy from underground nuclear tests of an equivalent magnitude—meaning as low as one to two kilotons. That would cover just about every weapons test by the Soviet Union and the United States since atmospheric testing was banned in 1963.

The revised summary says it is only possible to distinguish earthquakes from underground tests below a Richter magnitude of 4.5.

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That is equivalent to approximately 5 to 10 kilotons.

The original report grew out of a conference held at Woods Hole last summer, sponsored by the Pentagon's Advanced Research Projects Agency (ARPA). A scientist in ARPA explained the revisions in the report's summary by saying the original failed to reflect a "consensus" of the conference but instead represented the views of only one unnamed man.

### Based on Measurements

The technique for discriminating between earthquakes and underground tests discussed at the conference was based on measurements of two kinds of waves that are produced both by explosions and earthquakes: those that pass along the surface (surface waves) and those that pass through the body of the earth (body waves).

In more than 400 seismic events measured, it had been observed that at least down to a certain level of magnitude, an earthquake will almost always produce substantially more surface waves relative to its body waves than will a nuclear explosion.

The original report showed a 20-fold gain over what scientists were able to do five years ago in differentiating explosions from earthquakes. When the question of a ban on underground nuclear testing was discussed 10 years ago U.S. scientists could detect underground tests in the Soviet Union equivalent in earthquake force to 4.75 on the Richter scale, which is about equal to a 20-kiloton explosion.

Since many tests were below this magnitude, the United States felt on-site inspections were necessary for an underground test ban to be reliable. The Soviet Union rejected on-site inspection, although at one point offered to accept three inspections annually.

Sen. Clifford P. Case (R-N.J.) said recently that the gains reported in the ARPA paper should make it possible to monitor a ban on underground testing with the number of inspections Moscow was at one time prepared to accept.

### Within Competence

And former arms control director William C. Foster said last February that "it is fully within our scientific competence to monitor adequately... a total test ban."

While there are a number of

differences between the original summary in the ARPA report and the newly revised summary that was cleared for publication on May 24, the critical divergence is in the magnitude of explosion that may be differentiated by the seismic discrimination technique.

When The Washington Post on April 11 carried an article on the scientific findings based on the full two-volume report and the original summary, a number of senators and foreign embassies requested copies from the Pentagon.

The Pentagon's sensitivity to the report was apparent to Case, who said that the volumes he received had the summary ripped out. Only after he sent a telegram to Defense Secretary Melvin R. Laird did he get the original summary. He later received the revised summary.

One diplomat from a country allied with the United States says he got a run-around from the Pentagon and even had one man tell him that the report did not exist. When he finally got the two hefty volumes he received a copy of the revised summary. When reached Friday he said he was "unaware" that an earlier version existed.

### Called Incomplete

A Pentagon spokesman, asked about the alterations in the summary, said: "The original summary had not been cleared for open publication. Apparently, the original summary was done by a man who had chaired only about half of the meetings so it was not complete."

The spokesman said the revised summary contains "everything that is essential" in the original summary plus the substance of another summary from the person who chaired the other half of the meeting.

Informed that the whole thrust of the revised summary was different from the original, the spokesman allowed a scientist for ARPA to try to explain the discrepancies.

This scientist, who declined to be identified, essentially repeated the spokesman's words but added that the new summary reflects the "consensus" of the entire meeting while the original reflected the views of one man. He declined to say whether that one man was on the staff of ARPA.

The scientist acknowledged that the major difference was in the ability to discriminate explosions of a magnitude as

low, as 4 as in the original or 4.5 as in the revised summary.

The ARPA scientist said: "The difference between 4 and 4.5 is the difference between an enthusiastic scientific sort of feeling and a considered Department of Defense opinion that reflects what we think is possible in real world conditions. Everything we can do in the laboratory can't be done in real life."

### 400 Quakes Covered

The report, however, showed that experiments were carried on in the last four years in the "real world." According to the report, seismometer arrays in Norway and in four states in the United States were used to study the seismic motions of more than 400 earthquakes, many of them outside the United

States and at least 20 of them inside the Soviet Union.

At the same time, the seismometers measured more than 50 underground explosions at all five United States and Soviet sites, the two in Nevada, one at Amchitka Island in Alaska, at Semipalatinsk in Siberia and Novaya Zemlya Island in the Arctic Ocean.

When the existence of the report was disclosed, Sen. Edmund S. Muskie (D-Maine), chairman of the Senate subcommittee on arms control, said he would schedule hearings on the matter. Case said it should now be possible to enter into a treaty prohibiting all nuclear tests.

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