which prepared the draft report, Robert van den Bosch, a professor of entomology at the University of California, Berkeley, has charged that he and his colleagues have been subjected to "stonewalling, deceit, treachery and harassment" throughout the study.

One of van den Bosch's charges is that the Council for Agricultural Science and Technology (CAST) violated the confidentiality of the peer review process by making available to the agricultural trade press copies of a review of the report prepared by a CAST task force. This became an issue in the vote by members of the Entomological Society of America on whether to join other scientific societies as CAST members (*Science*, 20 August). Spokesmen for CAST reject the charges, insisting that it is CAST policy and EPA policy as well to give maximum public access to reviews and that the van den Bosch report was treated no differently from many other CAST publications. Van den Bosch's main complaint seems to be that the version was, after all, a draft, and shouldn't have been treated like a completed study.

For EPA, the report, which is still not out of the draft stage, has elicited exceptional interest and intensity of feeling. EPA officials hope that the report will provide "background for rulemaking" in an area which is regarded as important but where little analytical work had been done. The contract, worth $54,701, was awarded to the van den Bosch group effective June of 1974. EPA officials soon became aware that the matter was a complex and controversial one and circulated the draft widely for review across the full spectrum of pro-pesticide and anti-pesticide interest. Although the title of the report is "Investigation of the Effects of Food Standards on Pesticide Use," it is concerned specifically with "cosmetic damage which is actually caused by or attributed to insect pests" and deals almost exclusively with insecticides. It concentrates on California agriculture.

In the report the authors argue that state and federal quality standards reinforce the cosmetic requirements imposed by the big buyers of produce. A major legal mechanism underlying the system is the marketing orders which set criteria on quantity and quality for fruits and vegetables. Under these orders, limits can be set on the total quantity of a particular variety to be marketed over a season or a shorter period. Market advisory committees make the decisions and can set standards for quality as well as quantity. The system operates through the vote of producers and handlers.

The report contends that existing food quality standards and the quality standards imposed by growers cooperatives achieve high cosmetic standards at the cost of unnecessarily heavy use of insecticides. The authors also say that the standards restrict the volume of produce reaching the market, thus raising prices and benefiting growers more than consumers.

The van den Bosch group acknowledges that consumers are conditioned to "equate size and color with good taste and quality," but argue this connection is not necessarily valid and that consumers could be educated to accept less impeccable fruit at lower cost and with lighter use of pesticides. Some agricultural scientists argue that the consumer penchant for unflawed produce is a cultural preference with deep roots, but the subject is not discussed in any detail in the report.

Similarly, in discussing processed food, for which standards are set by the Food and Drug Administration, the report argues that there would be no hazard to health if levels of "insect debris" permitted to be left in processed food were to be raised somewhat. The argument again is that consumers would benefit from the reduced use of insecticides by growers, but the report's statement that the "long history of human ingestion of insects suggests this food is nontoxic to humans" is unlikely to make many instant converts.

One section of the long report (323 pages in typescript) is devoted to a review of the results of exposure of farmworkers to pesticides. The authors argue that because pesticides for cosmetic purposes are often applied shortly before harvesting in order to prevent the presence of insect debris in the produce, farmworkers are particularly vulnerable to their use.

The report is sharply critical of the in-

Checking on Nuclear Blasts

In July, the teleseismic network by which the United States monitors Soviet underground nuclear explosions registered two Soviet blasts, each of which appeared to be 200 kilotons in yield—or well above the 150-kiloton limit agreed to in a pair of treaties signed but not yet ratified by both sides. The Soviets have denied that they exceeded the 150-kiloton limit, but, nonetheless, political shock waves have been felt in the United States, amplified by the President's campaign defensiveness about détente. The incident illustrates the problems of verifying the 150-kiloton limit set by the threshold test ban treaty and its companion, the Peaceful Nuclear Explosions Treaty.

Since the disclosure, government seismic experts have begun admitting that methods for estimating underground nuclear blasts are so imprecise that they cannot tell whether each blast was indeed 200 kilotons, or some other yield, possibly as low as 100 kilotons or as high as 400 kilotons. Work is under way to narrow the range of the estimate, but experts say it is unlikely it will be narrowed by very much. The geology of a blast site affects the magnitude of the shock waves the blast transmits through the earth; hence, there are inherent uncertainties in estimating the yield of a given blast. This problem highlights the usefulness of the local geological information which each side must provide to the other in advance of any blast under both treaties (see page 743).

In the meantime, these uncertainties pose difficulties in accusing the Soviet Union of a violation, even if the Administration wanted to make such a charge. Perhaps reflecting its embarrassment on this point, the Energy Research and Development Administration, which has always estimated yields of Soviet detonations, has suddenly changed its policy and is now keeping this information secret.

A seismic expert who did not participate in the negotiations notes that, scientifically, a more precise limit would have been the size of the shock wave produced, which can be measured with great accuracy. But, however attractive technically, this approach was rejected for political reasons because the geology of the two countries' weapons test sites is different. Hence, the two sides could fire explosions of different yields, yet produce shocks of the same magnitude. Whether the fuzziness of measuring the 150-kiloton yield limit makes the two treaties unenforceable and unacceptable is for the Senate to judge when it considers ratification later this year.—D.S.