

yet been constructed or tested." Other methods of decoupling or evading detection include exploding bombs in porous rock, where the signal is reduced due to less efficient energy transfer, or exploding bombs simultaneously with natural earthquakes, when detection is more difficult.

New developments. The verification programs sponsored by DOE and DARPA may contribute greatly to this technical debate. The US treaty verification effort now relies on analyses of seismic data received from remote stations outside the USSR. However, six regional seismic stations, developed by Sandia Corporation and operated by Livermore, are now in place in the US and Canada. These unmanned remote stations feed digital data by satellite link to, among others, Sandia, Livermore and a new seismic center in Washington run by DARPA. The stations comprise the US Regional Seismic Test Network and, in contrast to the teleseismic data now used for verification, the network provides information over much smaller geographic areas. Nordyke told us that research on the regional signals from the network and their application to verification issues has just begun. This research is part of what Herman Roser (Assistant Secretary of Energy for Defense Programs) described to Congress in March as a plan to ensure that we have proven technology on hand that will allow us to install in-country seismic detectors if we reach an agreement with the Soviet Union about them.

The stations are also making nine-channel digital data available for the first time. This fall, DARPA began using some of these data to test whether algorithms it developed would work on realtime data.

In addition, Kerr told us about ongoing efforts at DARPA to improve our ability to handle data, by developing new algorithms—including algorithms to pick up seismic signals from background noise at low magnitudes, to describe waveforms, and to discriminate "interesting" events from others. DARPA has just established a test-bed Center for Seismic Studies in Washington, where computer experts and seismologists are working together using computer-generated graphics to develop and test the ability of algorithms to improve verification. The center will also house a library of waveforms they are creating to serve as a reference when making discriminations. Simultaneously, Don Anderson (Caltech) is one of the geophysicists working with DARPA on developing a new nonhomogeneous Earth model to enhance our understanding of the physics of the Earth. It is hoped that this more realistic model will increase our understanding of wave propagation and of

how signals are affected by the geology of the underlying area. This, in turn, may address problems with regional bias corrections now needed for seismic magnitude estimates.

Politics. For many of the people we spoke to, however, the technical debate is only the tip of the iceberg. The whole issue of verification and what it means for a comprehensive test ban treaty is deeply submerged in politics.

Jack Evernden expressed the concern of many seismologists and geophysicists we spoke to when he said, "The problem today in getting on with even a low-threshold treaty, much less a comprehensive one, is political, not technical. You could get seismologists together right now and they could all agree that for some low-level magnitude we could build a network with total detection capability. They could also agree that at some yet lower limit we could not do this. But the critical question is 'what is good enough?' What yield must we be able to detect, not for weapons improvement, but for national security? We haven't been able to get this question answered by the defense establishment so that we can weigh our technical ability to do this against the value of a comprehensive treaty. The differences among seismologists are a minor issue compared to this question."

In April President Reagan accused the Soviets of not complying with the 150-kiloton limit. Subsequently, a panel was formed under the leadership of William C. Clark, head of the National Security Council, to consider verification issues and advise the President. Meanwhile, the Soviet Union, in a public letter from their embassy in Washington, reiterated its willingness to negotiate a comprehensive agreement and its unwillingness to consider further verification improvements before the ones already negotiated have been put into effect.

Nonetheless, the Reagan Administration policy is that verification achieved through these various negotiations is inadequate. A State Department spokesman told us that the Reagan Administration position is still that while negotiating a comprehensive test ban treaty remains a high priority, resuming such negotiations depends on verification improvements, as well as on other issues. In a recent interview, an Administration source who asked to remain anonymous told us that this Administration believes that "the near-term prospects are not encouraging for negotiating adequate verification. There is also some concern within the Administration about national security issues bearing on a comprehensive test ban treaty, as part of the process of modernizing the strategic forces requires nuclear testing." —JC

Terhune to edit augmented JOSA

Robert W. Terhune, a senior scientist at the Ford Motor Company and editor of *Optics Letters*, will become the editor of an augmented *Journal of the Optical Society of America* with the journal's January 1984 issue. A new editor of *Optics Letters* is being sought.

JOSA is to split into parts A and B, following a plan Terhune devised. JOSA A will resemble the present journal. Subtitled *Optics* and published twelve times a year, it will include research on such areas as Fourier optics and image science; image and signal processing; optical components and systems; coherence and statistical optics; propagation and scattering; atmospheric and terrestrial optics; and physiological optics. JOSA B, subtitled *Optical Physics*, will start with six issues per year. It will deal with optical aspects of broader topics in physics: interface and surface physics; solids; lasers; ultraviolet and x-ray physics; ultrafast phenomena; laser spectroscopy and nonlinear optics; atomic spectroscopy; molecular spectroscopy; interactions with matter and quantum optics.

There are to be other changes, which Terhune hopes will stimulate both JOSA journals to grow and satisfy better the interests of OSA members: Topical editors, who will communicate electronically with a centralized reviewer file, will be responsible for accepting papers.

Terhune received a BS at the University of Michigan in 1947, an MA at Dartmouth College in 1948 and a PhD in physics in 1957 at the University of Michigan. He worked at the University until 1960, when he started at Ford Motor Company as a research physicist. He was manager of the physical electronics department 1965-75 and became senior staff scientist in the engineering and research staff in 1976. His research has involved quantum electronics, nonlinear optics, optical properties of solids and surfaces, molecular spectroscopy and advanced instrumentation.

in brief

The American Crystallographic Association has formed a new special-interest group on neutron scattering, headed by Thomas F. Koetzle (Brookhaven National Lab) and reconstituted one on small-angle scattering, now headed by Paul W. Schmidt (University of Missouri). Special-interest groups, which now number five, organize sessions at ACA meetings. □