

Since satellite surveillance has been suggested by some countries as a complementary means of verifying compliance with a nuclear test ban treaty, it should be mentioned that the outward and visible signs of such an evasion operation may offer little of significance for a satellite to see. The accompanying aerial photograph of a surface facility used in a USA underground nuclear experiment shows that the surface installations for underground nuclear explosions are similar to those for conventional mining or other large-scale industrial activities.

### **The Problem of Discrimination**

Once seismic waves have been detected, the source must be identified as an earthquake, a chemical explosion or a nuclear explosion. The decisive factors will include location and depth below the surface of the Earth, taking into account the fact that the limit of practical drilling capability at present is about 10–15 kilometres.

Surface location is also important: seismic events occurring in some locales, such as the ocean floor, are unlikely to be man-made explosions.

It must also be borne in mind that many areas may seem to be seismically inactive because high magnitude events may oc-

cur only rarely. However, those areas may be quite active in terms of events of lower magnitudes. Parts of Canada and the USA, for example, may register only one earthquake of Richter magnitude 4.5 in a decade, yet may sustain an average of one shock a day in the range of Richter magnitude 2.0–3.9 that would go unrecorded, except by local networks. The same is presumably true for the many granitic regions in the USSR.

### **10 000 Shocks a Year**

Generally speaking, an additional Richter magnitude of 0.5 (equivalent to trebling the size of the shock, see Figure 14) is needed, above the detection threshold, before a pronouncement can be made that a specific event is an explosion. With some 10 000 earthquakes of magnitude greater than Richter 4 occurring around the world each year and countless thousands of smaller events, the challenge of identification is a formidable one.