in several azimuths, and the appropriate studies are made of the probability distributions of scatter about trend lines, we can see no scientific objection to taking advantage of this possibility in this context.

Negative criteria have been shown useful when applied to other seismic phases. Evernden (1969a) illustrates the possibilities of identification using long period S waves. He finds that earthquakes down to about m5.0 have observable long period S waves; whereas no explosions smaller than about m5.7 have observable long period S and, where explosion S waves are observed, they are about a factor of 10 smaller than those observed for similar magnitude earthquakes. Thus, the possibility of identification of explosions by absence or presence of long period S waves exists for any events greater than about m5.0 . A similar criteria has been discussed by Evernden using Love and long period P waves. For the long period body phases particularly, the greatest problem is the nearness of the dominant periods of the phases to the peak in the microseismic noise spectrum and the probability of applying the discriminant (i.e., of detecting the signals in highly variable noise fields) may be small.

Although negative criteria cannot, by definition, provide positive identification of an underground explosion, the argument is substantially a tautological one. There are no sources of seismic energy of the sizes under discussion other than natural earthquakes or underground or underwater explosions; hence the certain elimination of the possibility of an earthquake origin provides a positive identification of an explosive source. Multivariate combinations of such negative criteria as the absence of the expected level of R_g , 20-second, or longer, period Rayleigh waves, long period S waves, long period P waves, and Love waves requires regionalized control data for its optimum application. Much work remains to be done with these techniques, but it seems very clear that the minimum improvements possible should be $\delta m 0.5$ on existing generally applicable positive criteria such as 20-second M versus m and Rayleigh wave spectral ratios, and probably somewhat less on more restricted but more successful positive criteria such as M_{Rg} versus m .