easy to find and the latter difficult. Thus, it is not likely that large traps of the anticlinal or fault types have been missed in well-drilled areas. But there is a fair chance that some great "other" kinds are still to be found.

Several techniques have been available for a long time, but none is routine. Detailed gravity-meter and torsion-balance surveys come high on my list, providing that core density values are carefully and competently measured (and now checked with a borehole gravimeter). Another important tool is the reflection seismograph, without CDP(!)—for scattered events, usually very poor.

These are only beginnings. They are of little value unless management, and searching engineers and scientists, are together in the gamble that focuses on the "big sleeper." They must look backward as well as forward. If they have made errors, they must study them to improve future practice. If they have been lucky, they must find why, to improve future practice—or continue to rest on luck.

So, try to get *good* case histories (not only the parts that justified pride but also the errors). Look for observations that were not thought necessary (*luck* was too good to require them!) but might still be made. Try to decide how that giant (*e.g.*, East Texas) might have been found with a *minimum* of good luck. This requires a very careful analysis and understanding.

Recognize the simple fact that no technique can ever be regarded as *sufficient* for success in this venture. No routine package can be sold with a claim that if you manage your field teams and fine instruments according to directions you can have success.

However, there are certain *necessary* conditions—the kind of conditions you can look back on. Possibly the most important of these is "a high level of intellectual honesty, general competence, and a wish to know fact from fiction for the purpose of future productive use through the whole exploration and production group." Though the industry does seek new ideas and processes quite actively, it is not particularly noted for relinquishing mistaken ideas—especially when these ideas have been very expensive. Thus a kind of smokescreen is erected by many circumstances. The air needs to be cleared by critical reexamination of premises.

It is interesting and valuable to inquire "what measurable differences exist in an environment of a large petroleum accumulation that are due to this accumulation?" The effects may be a little subtle, but not completely absent.

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Title to be announced

(No abstract submitted)

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PORTABLE REFRACTION SEISMOGRAPHY SURVEY OF GOLD PLACER AREAS NEAR NOME, ALASKA[1]

A seismic refraction study of the beach and tundra gold placer areas near Nome, Alaska, was made using a small, light-weight, portable seismograph during the summer of 1967. Geophone configuration and type of energy source were determined during a preliminary experimental survey.

Because the beach study was successful, a short experimental seismic line was completed inland to determine the usefulness of a portable refraction seismograph in permafrost areas near Nome. Basic problems in permafrost areas are the high seismic velocities in the overburden, caused by increase in elastic modulus in frozen ground, and the acoustical absorption and variable thickness of the overlying tundra. The increase in sediment velocity reduces the possibility that there is a marked velocity contrast at the bedrock-overburden interface, and the organic material of the tundra absorbs returning seismic energy. These problems were reduced by detonating the explosive energy source on the permafrost surface and by placing the geophones in the thaw zone of silt beneath the spongelike matter of the tundra.

The beach survey results indicated that internal stratigraphy of the overburden could be interpreted and seismic velocities assigned to the different units. A very low-velocity, dry to damp layer of Holocene sands covering most of the beach has seismic velocity values of 0.15–0.73 km/sec. In other low-velocity layers included in the overburden, and especially conspicuous near river mouths, velocity values range from 0.62 to 1.00 km/sec. A poorly consolidated nearshore or estuarine silt, clay, and sand layer of Sangamon age (late Pleistocene) with velocity values of 1.20–1.80 km/sec is below the very low-velocity layer. Beneath the estuarine material is a till of Illinoisan age (middle Pleistocene) that has a velocity of 2.80–4.00 km/sec. Bedrock was well defined in all seismograms and exhibited velocity values from 4.20 to 5.60 km/sec.

A basement contour map of the beach was constructed from depth data obtained along the beach with the refraction seismograph, from offshore seismic-reflection data, and from onshore drillhole information. Several buried channels were identified which may be sites of possible gold placer deposits. Beneath the tundra a bedrock surface dips under Dry Creek from both sides, and a bedrock contour map was drawn from refraction-seismograph data and drillhole information. Results of the Nome tundra survey illustrate the feasibility of the portable seismograph as a placer prospecting tool for use in tundra-permafrost areas.

[1] Publication authorized by the Director, U.S. Geological Survey, Washington, D.C.

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Title to be announced

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STRUCTURE OF THE CONTINENTAL SHELF OFF SOUTHERN OREGON

A detailed continuous seismic-profiling survey was conducted on the continental shelf off southern Oregon between Cape Blanco and the Oregon-California border during the summers of 1967 and 1968. This part of the shelf is divided into northern and southern regions, which appear to be unrelated structurally. The surface trace of a prominent angular unconformity, which crosses the continental shelf in a WSW direction between Cape Sebastian and the Rogue River, is the dividing line between the two regions. A series of folds parallel or subparallel with the coastline characterizes