

NOTES

Abstract:

Gravity and Magnetism for the Geologist and Geophysicist,
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To a great many petroleum exploration people the words "geophysics" and "seismograph" are almost synonymous and there is a tendency to forget that other methods have their uses in petroleum exploration. While it is true that seismograph operations consume some 90 per cent of the total geophysical expenditures the other methods have a definite and useful place in the total exploration picture.

This talk reviews briefly the fundamental principles of gravity and magnetic methods and outlines the geological problems in which they are applicable.

The gravity method has had very wide application but the interpretation of results is still rather largely limited to outlining "anomalies" by inspecting or by some sort of numerical operation (such as a second derivative calculation), then running seismograph lines over the large proportion of the anomalies. Careful consideration of the fundamentals, particularly the geological factors involved in the sources of density contrasts, the application of quantitative factors, and the relation to other geophysical or geological data, can lead to great improvement in the utility of such surveys. This talk was illustrated with examples of various types of gravity anomalies and their interpretation. Also a brief outline of the possibilities and limitations of airborne gravity measurements was included.

The magnetic method and particularly its airborne variation can be very useful in general reconnaissance. Recent developments in instrumentation have lead to a degree of detail and dependability in the recordings which permits quantitative analysis of such surveys to a much higher degree than was possible from point-to-point measurements made on the ground. It is now possible to determine the thickness of the sedimentary section very reliably and in many areas to outline structural disturbances and locate faulting involving the basement rocks. Examples were illustrated showing applications of geological interpretation such as basement involvement in thrust movement.

(See illustrations - page 16.)

*Presented before the Society, April 10, 1961

