

# INTRODUCTION TO GEOPHYSICAL PROSPECTING

FOURTH EDITION

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In characterizing the state of exploration geophysics today, I am prompted to refer to the first sentences of the prefaces of the second and third editions of this text. The lead sentence to the second edition reads "In the eight years since the first edition of *Introduction to Geophysical Prospecting* was published, there have been more extensive technical advances in the field of geophysical exploration than in any similar period since the earliest years of the art." The third edition reads "Revolutionary changes since 1960 in all aspects of geophysical technology have necessitated a much more thorough revision of this text than is usually required between successive editions of a book."

At the risk of being repetitious, I would begin this preface with the observation that the pace of technological advance in geophysical prospecting, like that in most other technical disciplines, is, if anything, accelerating. Even in so short a time as in the four years that this edition has been in preparation, whole sections have had to be revised, added, or omitted to keep pace with progress in technology.

In exploration geophysics, progress has been made along a broad and diversified front. More data are gathered in the field. For example, within the last 60 years, the number of bits of information gathered in a seismic survey per mile of line surveyed has increased more than 10,000-fold. A further 10-fold increase is in the offing. Additionally, more types of data are being acquired. An example is gradient information in potential fields or shear-wave information in seismic prospecting.

Because the power of computers (internal memory size multiplied by computation rate) has for 30 years or more been increasing 10-fold about every 2½ years, computers have almost kept abreast of geophysical data flow, but, more