PRESENT STATUS OF THE CARBON-RATIO THEORY

W. T. THOM, JR.¹
Princeton, New Jersey

INTRODUCTION

The "carbon-ratio theory" as generally understood assumes, first, that commercially important oil (and gas) pools are to be sought only within regions where heat and pressure have not induced more than certain amounts of rock metamorphism; and second, that coals (where present) can be used as indicating the position of the metamorphic "dead-line" limiting the occurrence of commercial oil pools. That these propositions are adequately substantiated in a broad way by accumulated geological observations is scarcely to be doubted. The accuracy and precision with which "carbon ratios" can be employed in estimating the promise of possible oil occurrence in unprospected territory is, on the other hand, by no means established, even though a number of geologists have assumed that the carbon-ratio "theory" has the validity of a "law," and have classed borderline areas as "impossible oil territory" on carbon-ratio evidence, when they should have merely reported "that the chance for making important oil discoveries within such specified areas is very seriously lessened by the indicated intensity of local metamorphism."

Because of current assumptions as to the utility and practical value of carbon ratios as guides in projected oil exploration, and because of the bearing of carbon-ratio evidence upon problems outside the field of the petroleum geologist, the writer has undertaken a comprehensive review of the facts and factors underlying the carbon-ratio theory in an endeavor to ascertain the scientific status it should now enjoy, and the degree of reliance which should be placed on it in practical petroleum geology. In this endeavor, the writer will consider in turn the evolution of the carbon-ratio theory; the evidence in favor of the theory; the objections which have been advanced against it; the factors limiting the precision with which it can be given practical application; and the general status and

¹ Walter B. Sharp research fellow of The Rice Institute (1931-32). Department of geology, Princeton University.