

PREFACE

The work on which this publication is based was initiated several years ago as a project for Shell Development Company, A Division of Shell Oil Company, while I was in their employ as a research geologist. Extensive revision of the original report prepared for Shell Development Co. (Shell EPR Publication 466), amplification of more recent concepts, and investigations of additional aspects have been done while in residence at Louisiana State University, Baton Rouge, Louisiana.

This volume of The International Sedimentary Petrographical Series is intended to be used as a manual by stratigraphers, sedimentologists and petrologists for the identification of fossil fragments in rock thin sections and polished rock samples. The criteria on which the identification procedures are based are selected to allow the geologist, not especially trained as a paleontologist, to make identification of most invertebrate fossils at the phylum and class levels. Some groups such as calcareous algae and Protozoa require special preparation techniques beyond the normal abilities of the non-specialist, consequently, these groups are not included. A few other groups are so rare as fossils that they also are excluded. For special studies of fossil algae reference can be made to the many well-illustrated publications of J. Harlan Johnson, particularly Johnson (1961). For special studies of the wall structure and mineralogy of Foraminifera, reference can be made to Loeblich and Tappan (1964).

The text and plates are arranged in sections, alphabetically by phylum and class. Each section of the text contains a generalized description of the organisms in that group, together with descriptions of morphologic features and microstructures which will aid in the recognition of the organisms from fragments exposed in thin section. More complete descriptions of invertebrate morphology can be found in The Geological Society of America *Treatise on Invertebrate Paleontology* published by The University of Kansas Press. Other selected references on shell mineralogy and microstructure are listed in the bibliography.

The plates include idealized drawings of common microstructures and organisms and are intended to show general characteristics of the major phyla of fossil invertebrates. The photomicrographs of thin sections and acetate peels have been selected to illustrate skeletal morphology and microstructures in oriented and random cuts through as many growth forms as practicable. With only a few exceptions, the organic fragment illustrated can be identified to the phylum level from the features in the field of view.

None of the fossils used for illustration is a type specimen. The structures which are shown are found in specimens which have been identified as a species, genus, or family from whole skeletons before thin-sectioning. A specific, generic, or family name accompanying the explanation of a photograph is used only for reference and does not necessarily imply that identifications can be made at these taxonomic levels from the features illustrated in the figure. Letter-number symbols in the captions refer to thin sections in the author's collection.

Many persons have graciously given of their time, their materials, and their talents in order to make this publication possible. I am pleased to acknowledge their assistance.

Dr. Bob F. Perkins, Associate Professor in The School of Geology, Louisiana State University, reviewed the original manuscript, supervised its revision, and generously provided the facilities, opportunity, and freedom to work. Dr. C. O. Durham, Jr., Director, and Dr. H. V. Anderson, Dr. John C. Ferm, Dr. James P. Morgan, and Dr. Adolph E. Sandberg, Professors in The School of Geology, read the manuscript. I am grateful for their comments as well as their understanding and cooperation. Dr. Henryk B. Stenzel, Visiting Professor in The School of Geology, contributed identifications of the oysters and information on their shell structures through the loan of specimens and many delightful hours of conversation.

An expression of gratitude is also due many former colleagues and associates at Shell Development Company who could not be acknowledged properly in a company report for putting forth their best efforts when something less would have sufficed. Mr. D. L. Parker, now owner of National Petrographic Service Co., prepared much of the initial study material and literally gave of himself

in producing some of the early thin sections. Mr. David S. Pettus later worked with the author in developing preparation techniques. Mr. Bruce Gray and photographers, Mr. Robert O. Girndt and Mr. James L. Cox are responsible for the quality of most of the low-magnification photographs which appear in this publication. The talent of Mr. Jack W. Moore enhanced the quality of all of the drawings. Mr. Jaime F. Laverde drafted the flow chart and aided in expediting this final product. Mrs. Judy G. Breeding and her staff edited the first manuscript and thereby minimized the effort involved in its revision. Mr. Bob Chester and his reproduction staff set the standard to be achieved for the revised form. The original manuscript was reviewed at Shell by Messrs. R. Wright Barker, Don Beard, S. D. Kerr, F. J. Lucia, Roger Swanson, Dr. Bob F. Perkins, and Dr. James Lee Wilson, who is also responsible for introducing it to the editors of The International Sedimentary Petrographical Series.

Finally, I should like to thank Dr. W. C. Bell, Professor at the University of Texas in Austin, for donating much of the early study material and for his constant, unrelenting encouragement through the many years of our friendship.

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