

**FIELDIANA GEOLOGY, NEW
SERIES, NO. 2. JULY 30, 1979;
ORGANIC BUILDUPS IN THE LOWER
ORDOVICIAN (CANADIAN) OF
TEXAS AND OKLAHOMA**

Published @ 2017 Trieste Publishing Pty Ltd

ISBN 9780649101665

Fieldiana geology, New series, No. 2. July 30, 1979; Organic buildups in the Lower Ordovician (Canadian) of Texas and Oklahoma by Donald Francis Toomey & Matthew H. Nitecki

Except for use in any review, the reproduction or utilisation of this work in whole or in part in any form by any electronic, mechanical or other means, now known or hereafter invented, including xerography, photocopying and recording, or in any information storage or retrieval system, is forbidden without the permission of the publisher, Trieste Publishing Pty Ltd, PO Box 1576 Collingwood, Victoria 3066 Australia.

All rights reserved.

Edited by Trieste Publishing Pty Ltd.
Cover @ 2017

This book is sold subject to the condition that it shall not, by way of trade or otherwise, be lent, re-sold, hired out, or otherwise circulated without the publisher's prior consent in any form or binding or cover other than that in which it is published and without a similar condition including this condition being imposed on the subsequent purchaser.

www.triestepublishing.com

DONALD FRANCIS TOOMEY & MATTHEW H. NITECKI

**FIELDIANA GEOLOGY, NEW
SERIES, NO. 2. JULY 30, 1979;
ORGANIC BUILDUPS IN THE LOWER
ORDOVICIAN (CANADIAN) OF
TEXAS AND OKLAHOMA**

FIELDIANA

Geology

Published by Field Museum of Natural History

New Series, Number 2

ORGANIC BUILDUPS IN THE LOWER ORDOVICIAN (CANADIAN) OF TEXAS AND OKLAHOMA

DONALD FRANCIS TOOMEY

*Senior Geological Associate
Cities Service Company
Midland, Texas*

and

MATTHEW H. NITECKI

*Curator, Fossil Invertebrates
Field Museum of Natural History
Chicago, Illinois*

July 30, 1979

Publication 1299

Library of Congress Catalog Card No.: 79-51552

ISSN 0096-2651

PRINTED IN THE UNITED STATES OF AMERICA



This work is dedicated in gratitude and
respect to our friend and colleague
the late
DR. WILLIAM EUGENE HAM
1917—1970

ABSTRACT

Organic buildups are conspicuous sedimentary features within various stratigraphic horizons of the Lower Ordovician of Texas and Oklahoma. Detailed examination and collecting of buildups exposed in the Franklin Mountains of West Texas, the Wichita Mountains of southwestern Oklahoma, and the Arbuckle Mountains of southern Oklahoma indicates that they are small-scaled features with a limited and relatively simple biotic assemblage, as are the consistently occurring accessory organisms that appear on the buildups. In some instances, a threefold vertical ecologic zonation may be apparent. The zonation seems to reflect organism response to changing physical conditions associated with progressive shallowing of the depositional environment. This zonation has been termed: (1) pioneer community, (2) mature community, and (3) climax community, with various organisms dominating the succession. Many organic buildups are not ecologically zoned, and this is believed to be a reflection of organisms growing and developing within a relatively unchanging shallow-water depositional environment.

Moundrock is unbedded, massive, and is characterized by *in situ* concentrations of organisms. Petrologically, moundrock can be described as burrowed, intraclastic, skeletal wackestone to boundstone. Intermound rock is darker in color, thin-bedded, and generally does not contain appreciable amounts of mound-shed debris. Erosional channels, either cutting into the mound or surrounding the organic buildups, are common in some mound intervals. The channels contain sorted calcarenites composed principally of mound-shed debris.

A feature common to all Lower Ordovician organic buildups is the almost complete absence of draping beds adjacent to the mounds. Intermound rock usually just laterally abuts into the organic buildups without significant dips.

The relative simplicity of Lower Ordovician organic buildups is to some extent explained on the basis of the rather primitive stage of development of the mound-building biota.

Coeval, faunally similar (algal/sponge) biostromal horizons in Texas are described in relationship to the buildup horizons and to their paleogeographic settings.

Comparisons of the Lower Ordovician organic buildups of West Texas and southern Oklahoma are made with reported occurrences of similar buildups in western Utah, western Canada, and western Newfoundland, and the similarities and differences noted.

Comparison is also made to temporally younger (Chazyan) organic buildups present in the Lake Champlain region of the north-eastern United States. Although the Chazyan buildups are similar in gross morphology, petrology, and basic biotic composition and sequence, they do contain evolutionarily more advanced organisms possessing a greater ecologic capability to further exploit niches on organic buildups.

TABLE OF CONTENTS

ABSTRACT	V
LIST OF ILLUSTRATIONS	IX
LIST OF TABLES	XIII
ACKNOWLEDGEMENTS	XV
INTRODUCTION	1
REGISTER OF LOCALITIES	3
SPONGE HORIZONS AND ORGANIC BUILDUPS IN THE LOWER ORDOVICIAN OF TEXAS . . .	6
ORGANIC BUILDUPS IN THE EL PASO GROUP OF WEST TEXAS AND SOUTHERN NEW MEXICO	10
Introduction	10
Definition and Regional Relationships of the El Paso Group	13
McKelligon Canyon Formation Organic Buildups	14
Moundrock Petrology	21
Channel Rock Petrology	34
Mound Foundation	35
Intermound Rock	37
Occurrence of <i>Ceratopea</i> within the Mound Interval	37
Conodonts	38
Role of <i>Pulchritamina</i> in West Texas Organic Buildups	41
Growth and Development of a McKelligon Canyon Formation Organic Buildup	42
Summary	46
MONUMENT SPRING MEMBER OF THE MARATHON FORMATION, MARATHON REGION, SOUTHWESTERN TEXAS	48
Stratigraphic History	48
Subsequent Findings	53
Petrology	53
Megafossils	53
Conodonts	55
Summary	55
ELLENBURGER SPONGE BEDS OF CENTRAL TEXAS	58
Stratigraphic Relationships	58
Lithology	59
Algal-Sponge Biostromal Units	60
Paleoecologic Setting of the Ellenburger Sponge Beds	68
SPONGE HORIZONS AND ORGANIC BUILDUPS IN THE LOWER ORDOVICIAN OF OKLAHOMA	72
SUMMARY OF THE GEOLOGY OF THE WICHITA MOUNTAINS	76