

**BULLETIN OF THE UNITED STATES  
GEOLOGICAL SURVEY NO.  
31. SYSTEMATIC REVIEW OF  
OUR PRESENT KNOWLEDGE OF FOSSIL  
INSECTS, INCLUDING MYRIAPODS AND  
ARACHNIDS**

Published @ 2017 Trieste Publishing Pty Ltd

ISBN 9780649479009

Bulletin of the United States Geological Survey No. 31. Systematic Review of Our Present Knowledge of Fossil Insects, Including Myriapods and Arachnids by Samuel Hubbard Scudder

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](http://www.triestepublishing.com)

**SAMUEL HUBBARD SCUDDER**

**BULLETIN OF THE UNITED STATES  
GEOLOGICAL SURVEY NO.  
31. SYSTEMATIC REVIEW OF  
OUR PRESENT KNOWLEDGE OF FOSSIL  
INSECTS, INCLUDING  
MYRIAPODS AND ARACHNIDS**





DEPARTMENT OF THE INTERIOR

---

STANFORD LIBRARY  
BULLETIN

OF THE

UNITED STATES

GEOLOGICAL SURVEY

No. 31



WASHINGTON  
GOVERNMENT PRINTING OFFICE  
1886

46

UNITED STATES GEOLOGICAL SURVEY

J. W. POWELL, DIRECTOR

---

SYSTEMATIC REVIEW

OF OUR

PRESENT KNOWLEDGE OF FOSSIL INSECTS

INCLUDING

MYRIAPODS AND ARACHNIDS

BY

SAMUEL HUBBARD SCUDDER



WASHINGTON  
GOVERNMENT PRINTING OFFICE  
1886





## CONTENTS.

	Page.
LETTER OF TRANSMITTAL .....	7
MYRIAPODA .....	9
Bibliography .....	9
Characteristics and phylogeny .....	9
Table showing geological distribution .....	13
1. Order Protosyngnatha Scudder .....	13
2. Order Chilopoda Latreille .....	14
3. Order Archipolypoda Scudder .....	15
4. Order Diplopoda Gervais .....	17
ARACHNIDA .....	19
Bibliography .....	19
Characteristics and geological history .....	19
Table showing geological distribution .....	22
1. Order Acari Leach .....	22
2. Order Chelonethi Thorell .....	23
3. Order Anthracomarti Karsch .....	23
4. Order Pedipalpi Latreille .....	25
5. Order Scorpiones Thorell .....	26
6. Order Opiliones Sundevall .....	29
7. Order Araneæ Sundevall .....	29
INSECTA .....	32
Bibliography .....	32
Characteristics and development .....	34
A. Palaeodictyoptera Goldenberg .....	36
Bibliography .....	36
1. Section Orthopteroidea Scudder .....	38
2. Section Neuropteroides Scudder .....	41
3. Section Hemipteroidea Scudder .....	45
4. Section Coleopteroides Scudder .....	45
B. Heterometabola Packard .....	46
1. Order Orthoptera Olivier .....	46
Bibliography .....	46
2. Order Neuroptera Linné .....	51
Bibliography .....	51
3. Order Hemiptera Linné .....	58
Bibliography .....	58
4. Order Coleoptera Linné .....	65
Bibliography .....	65
C. Metabola Packard .....	85
5. Order Diptera Linné .....	85
Bibliography .....	85

	Page.
<b>INSECTA</b> — Continued.	
C. Metabola Packard — Continued.	
6. Order Lepidoptera Linné .....	94
Bibliography .....	94
7. Order Hymenoptera Linné .....	96
Bibliography .....	96
<b>HISTORY AND DISTRIBUTION OF FOSSIL INSECTS.</b> .....	102
Tables showing the geological distribution of insects .....	110
Table of comparative distribution of extinct and existing orders .....	111
Comparative histories of Myriapoda, Arachnida, and Hexapoda .....	111
Table indicating the chronological range of presumed ancestral and extinct stocks .....	113
<b>INDEX</b> .....	115

## LETTER OF TRANSMITTAL.

---

CAMBRIDGE, MASS., *January 13, 1886.*

SIR: I have the honor to transmit for publication as a bulletin of the Survey the inclosed systematic review of our present knowledge of fossil insects, including myriapods and arachnids.

While much fuller in the modern orders and families, the following pages represent the English text furnished to Dr. Zittel for his *Handbuch der Paläontologie*, where the section forms the closing pages of the second part of the first volume (pp. 721-831) and is accompanied by more than two hundred illustrations. The present bulletin is issued, with the concurrence of Dr. Zittel and the publisher of the *Handbuch*, for the convenience of English readers. A French version, under the auspices of M. Barrois, is also in course of simultaneous publication. The present is its original form and is the authoritative English edition.

I am, very truly, yours,

SAMUEL H. SCUDDER.

Hon. J. W. POWELL,  
*Director United States Geological Survey.*