

**CIHM  
Microfiche  
Series  
(Monographs)**

**ICMH  
Collection de  
microfiches  
(monographies)**



**Canadian Institute for Historical Microreproductions / Institut canadien de microreproductions historiques**

**© 1997**

## Technical and Bibliographic Notes / Notes techniques et bibliographiques

The Institute has attempted to obtain the best original copy available for filming. Features of this copy which may be bibliographically unique, which may alter any of the images in the reproduction, or which may significantly change the usual method of filming are checked below.

- Coloured covers / Couverture de couleur
- Covers damaged / Couverture endommagée
- Covers restored and/or laminated / Couverture restaurée et/ou pelliculée
- Cover title missing / Le titre de couverture manque
- Coloured maps / Cartes géographiques en couleur
- Coloured ink (i.e. other than blue or black) / Encre de couleur (i.e. autre que bleue ou noire)
- Coloured plates and/or illustrations / Planches et/ou illustrations en couleur
- Bound with other material / Relié avec d'autres documents
- Only edition available / Seule édition disponible
- Tight binding may cause shadows or distortion along interior margin / La reliure serrée peut causer de l'ombre ou de la distorsion le long de la marge intérieure.
- Blank leaves added during restorations may appear within the text. Whenever possible, these have been omitted from filming / Il se peut que certaines pages blanches ajoutées lors d'une restauration apparaissent dans le texte, mais, lorsque cela était possible, ces pages n'ont pas été filmées.
- Additional comments / Commentaires supplémentaires:

L'Institut a microfilmé le meilleur exemplaire qu'il lui a été possible de se procurer. Les détails de cet exemplaire qui sont peut-être uniques du point de vue bibliographique, qui peuvent modifier une image reproduite, ou qui peuvent exiger une modification dans la méthode normale de filmage sont indiqués ci-dessous.

- Coloured pages / Pages de couleur
- Pages damaged / Pages endommagées
- Pages restored and/or laminated / Pages restaurées et/ou pelliculées
- Pages discoloured, stained or foxed / Pages décolorées, tachetées ou piquées
- Pages detached / Pages détachées
- Showthrough / Transparence
- Quality of print varies / Qualité inégale de l'impression
- Includes supplementary material / Comprend du matériel supplémentaire
- Pages wholly or partially obscured by errata slips, tissues, etc., have been refilmed to ensure the best possible image / Les pages totalement ou partiellement obscurcies par un feuillet d'errata, une pelure, etc., ont été filmées à nouveau de façon à obtenir la meilleure image possible.
- Opposing pages with varying colouration or discolourations are filmed twice to ensure the best possible image / Les pages s'opposant ayant des colorations variables ou des décolorations sont filmées deux fois afin d'obtenir la meilleure image possible.

This item is filmed at the reduction ratio checked below /  
Ce document est filmé au taux de réduction indiqué ci-dessous.

<b>10x</b>		<b>14x</b>		<b>18x</b>		<b>22x</b>		<b>26x</b>		<b>30x</b>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<b>12x</b>		<b>16x</b>		<b>20x</b>		<b>24x</b>		<b>28x</b>	<b>32x</b>

The copy filmed here has been reproduced thanks to the generosity of:

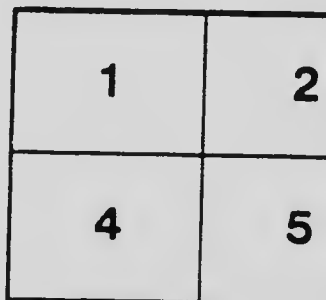
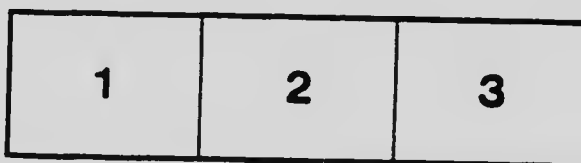
Stauffer Library  
Queen's University

The images appearing here are the best quality possible considering the condition and legibility of the original copy and in keeping with the filming contract specifications.

Original copies in printed paper covers are filmed beginning with the front cover and ending on the last page with a printed or illustrated impression, or the back cover when appropriate. All other original copies are filmed beginning on the first page with a printed or illustrated impression, and ending on the last page with a printed or illustrated impression.

The last recorded frame on each microfiche shall contain the symbol  $\rightarrow$  (meaning "CONTINUED"), or the symbol  $\nabla$  (meaning "END"), whichever applies.

Maps, plates, charts, etc., may be filmed at different reduction ratios. Those too large to be entirely included in one exposure are filmed beginning in the upper left hand corner, left to right and top to bottom, as many frames as required. The following diagrams illustrate the method:



L'exemplaire filmé fut reproduit grâce à la générosité de:

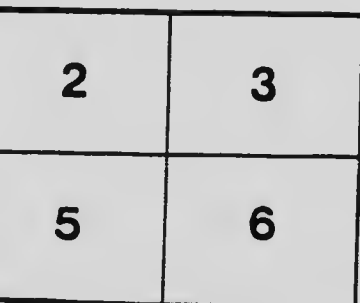
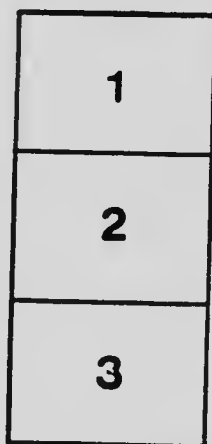
Stauffer Library  
Queen's University

Les images suivantes ont été reproduites avec le plus grand soin, compte tenu de la condition et de la netteté de l'exemplaire filmé, et en conformité avec les conditions du contrat de filmage.

Les exemplaires originaux dont la couverture en papier est imprimée sont filmés en commençant par le premier plat et en terminant soit par la dernière page qui comporte une empreinte d'impression ou d'illustration, soit par le second plat, selon le cas. Tous les autres exemplaires originaux sont filmés en commençant par la première page qui comporte une empreinte d'impression ou d'illustration et en terminant par la dernière page qui comporte une telle empreinte.

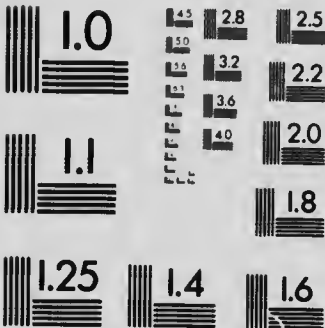
Un des symboles suivants apparaîtra sur la dernière image de chaque microfiche, selon le cas: le symbole  $\rightarrow$  signifie "A SUIVRE", le symbole  $\nabla$  signifie "FIN".

Les cartes, planches, tableaux, etc., peuvent être filmés à des taux de réduction différents. Lorsque le document est trop grand pour être reproduit en un seul cliché, il est filmé à partir de l'angle supérieur gauche, de gauche à droite, et de haut en bas, en prenant le nombre d'images nécessaire. Les diagrammes suivants illustrent la méthode.



# MICROCOPY RESOLUTION TEST CHART

(ANSI and ISO TEST CHART No. 2)



**APPLIED IMAGE Inc**

1653 East Main Street  
Rochester, New York 14609 USA  
(716) 482-0300 - Phone  
(716) 288-5989 - Fax

REPORT  
OF THE  
CANADIAN ARCTIC EXPEDITION  
1913-18

VOLUME IX: ANNELIDS, PARASITIC  
WORMS, PROTOZOANS, ETC.

PART C: HIRUDINEA

By J. PERCY MOORE

SOUTHERN PARTY, 1913-1916



G  
670  
1913 C2c  
v. 9, Pt. C.  
c. 3

OTTAWA  
THOMAS MULVEY  
PRINTER TO THE KING'S MOST EXCELLENT MAJESTY  
1921

Issued February 4, 1921.

G  
670  
1913  
C2t  
v. 009  
pt. C  
c. 3

# Report of the Canadian Arctic Expedition, 1913-18.

## VOLUME I: GENERAL INTRODUCTION, NARRATIVE, ETC.

- Part A: NORTHERN PARTY, 1913-18.  
Part B: SOUTHERN PARTY, 1913-16. By Rudolph Martin Anderson.....(In preparation).

## VOLUME II: MAMMALS AND BIRDS

- Part A: MAMMALS OF WESTERN ARCTIC AMERICA. By Rudolph Martin Anderson.....(In preparation).  
Part B: BIRDS OF WESTERN ARCTIC AMERICA. By R. M. Anderson and P. A. Taverner.....(In preparation).

## VOLUME III: INSECTS

- INTRODUCTION. By C. Gordon Hewitt.....(Issued December 10, 1920)  
Part A: COLLEMBOLA. By Justus W. Folsom.....(Issued July 10, 1919).  
Part B: NEUROPTEROID INSECTS. By Nathan Banks.....(Issued July 11, 1919).  
Part C: DIPTERA.  
Crane-flies. By Charles P. Alexander.  
Mosquitoes. By Harrison G. Dyar.  
Diptera (excluding Tipulidae and Culicidae). By J. R. Malloch.....(Issued July 14, 1919).  
Part D: MALLOPHAGA AND ANOPLURA.  
Mallophaga. By A. W. Baker.  
Anoplura. By G. F. Ferris and G. H. F. Nuttall.....(Issued September 12, 1919).  
Part E: COLEOPTERA.  
Forest Insects including Ipidae, Cerambycidae, and Buprestidae. By J. M. Swaine.  
Carabidae and Silphidae. By H. C. Fall.  
Coccinellidae, Elateridae, Chrysomelidae and Rhynchophora (excluding Ipidae).  
By C. W. Lenz.  
Dytiscidae. By J. D. Shorman, Jr.....(Issued December 12, 1919).  
Part F: HEMIPTERA. By Edward P. Van Duzee.....(Issued July 11, 1919).  
Part G: HYMENOPTERA AND PLANT GALLS.  
Sawflies. (Tenthredinoidea). By Alex. D. MacGillivray.  
Parasitic Hymenoptera. By Charles T. Brues.  
Wasps and Bees. By F. W. L. Sladen.  
Plant Galls. By E. Porter Felt.....(Issued November 3, 1919).  
Part H: SPIDERS, MITES AND MYRIAPODS.  
Spiders. By J. H. Emerton.  
Mites. By Nathan Banks.  
Myriapoda. By Ralph V. Chamberlin.....(Issued July 14, 1919).  
Part I: LEPIDOPTERA. By Arthur Gibson.....(Issued January 10, 1920).  
Part J: ORTHOPTERA. By E. M. Walker.....(Issued September 4, 1920).  
Part K: INSECT LIFE ON THE WESTERN ARCTIC COAST OF AMERICA. By Frits Johansen.....(In press).

## VOLUME IV: BOTANY

- Part A: FRESHWATER ALGAE AND FRESHWATER DIATOMS. By Charles W. Lowe.....(In preparation).  
Part B: MARINE ALGAE. By F. S. Collins.....(In preparation).  
Part C: FUNGI. By John Dearness.....(In preparation).  
Part D: LICHENS. By G. K. Merrill.....(In preparation).  
Part E: MOSSES. By R. S. Williams.....(In press).

## VOLUME V: BOTANY

- Part A: VASCULAR PLANTS. By James M. Macoun and Theo. Holm.....(In press).  
Part B: CONTRIBUTIONS TO THE MORPHOLOGY, SYNONYMY, AND GENERAL DISTRIBUTION OF ARCTIC PLANTS. By Theo. Holm.....(In press).  
Part C: GENERAL NOTES ON ARCTIC VEGETATION. By Frits Johansen. (In preparation)

## VOLUME VI: FISHES, TUNICATES, ETC.

- Part A: FISHES. By F. Johansen.....(In preparation).  
Part B: ASCIDIANS, ETC. By A. G. Huntsman.....(In preparation).

## VOLUME VII: CRUSTACEA

- Part A: DECAPOD CRUSTACEANS. By Mary J. Rathbun.....(Issued August 18, 1911).  
Part B: SCHIZOPOD CRUSTACEANS. By Waldo L. Schmitt.....(Issued September 22, 1911).  
Part C: CUMACEA. By W. T. Calman.....(Issued October 15, 1920).  
Part D: ISOPODA. By P. L. Boone.....(Issued November 10, 1920).  
Part E: AMPHIPODA. By Clarence R. Shoemaker.....(Issued September 7, 1920).  
Part F: PYCNOGONIDA. Leon J. Cole.....(Issued January 3, 1921).  
Part G: EUPHYLLOPODA. By F. Johansen.....(In preparation).  
Part H: CLADOCERA. By Chancey Juday.....(Issued June 23, 1920).  
Part I: OSTRACODA. By R. W. Sharpe.....(In preparation).  
Part J: FRESHWATER COPEPODA. By C. Dwight Marsh.....(Issued April 21, 1920).  
Part K: MARINE COPEPODA. By A. Willey.....(Issued June 23, 1920).  
Part L: PARASITIC COPEPODA. By Charles B. Wilson.....(Issued August 6, 1920).  
Part M: CIRRIPELIA. By H. A. Pilsbry.....(In preparation).

REPORT  
OF THE  
CANADIAN ARCTIC EXPEDITION  
1913-18

VOLUME IX: ANNELIDS, PARASITIC  
WORMS, PROTOZOANS, ETC.

PART C: HIRUDINEA

By J. PERCY MOORE

SOUTHERN PARTY, 1913-1916



OTTAWA  
THOMAS MULVEY  
PRINTER TO THE KING & MOST EXCELLENT MAJESTY  
1921



670 17003

## Hirudinea of the Canadian Arctic Expedition, 1913-18.

By J. PERCY MOORE.

University of Pennsylvania.

The Canadian Arctic expedition from 1913 to 1916 collected very few leeches. These are contained in four bottles sent along with a few bottles of planarians by Mr. Frits Johansen. There are but two species already well known from the seas of northern Europe but as they have not been recorded previously from American waters it seems worth while to publish a notice of the extension of their known geographical range. Both belong to the family Ichthyobdellidae.

### Family ICHTHYOBDELLIDÆ.

#### *Abranchus scorpii* Malm.

This species, with which *A. brunneus* Johansson is probably identical, is represented by nineteen specimens varying from 14 mm. to 40 mm. long and from .8 mm. to 2.7 mm. in maximum diameter. All of the specimens are nearly terete or only very slightly flattened, the young ones most so. The greatest diameter is shortly behind the middle from which it tapers both ways but unequally. The anterior end is more slender and more gradually tapered but there is no distinct division into two regions. In the better preserved specimens both oral and caudal suckers are large, thin and widely expanded, the oral relatively less so on the larger examples.

On none of the specimens is the annulation strongly marked, the somites being dominantly triannulate with the secondary annuli more or less well differentiated. Thus in the widest part of the posterior region the neural or middle primary annulus is enlarged and clearly subdivided into secondary annuli which, however, are smaller than the entire first and third primary annuli so that we have the formula  $(b' + b'') < b^3 + b^1 > (b^2 + b^0)$ . In the anterior region development of annuli has gone less far, being recognizable only in the neural annuli. The formula is, therefore,  $A^1 < (b^3 + b^1) > .1^2$ . The sensillæ and larger non-segmental cutaneous sense organs are developed on annulus  $b^3$  and a few smaller ones on  $b^1$ ,  $b^2$  and  $b^0$ .

The fresh colour as described in the collector's notes is "a dark purple-brown main-color; strongest red in shape of segmental bands. The two terminal suctorial discs pale inside with the brown muscles shining through. Eyes black." The preserved specimens differ considerably chiefly as a result of size and fading. Those from station 42<sup>m</sup> are most deeply pigmented, being of a dark reddish brown above, paler below. The margins of both discs, two transverse bands on the oral disc and radiating lines and marginal spots on the caudal disc, several transverse bands on the body, and the region about the anus also paler. Those from station 49<sup>m</sup> are pale reddish brown above with whitish transverse bands especially conspicuous laterally on the first annulus ( $A^1$ ) of each somite. All of the parts indicated as pale reddish on the specimens from 42<sup>m</sup> are on these whitish. Small individuals are nearly colourless. The sensillæ and non-segmental sense-organs are clear white and very conspicuous on dark specimens. The three pairs of eyes are black and arranged as figured by Johansson. The caudal eye-spots also are black, small and arranged in a circle at the central ends of the pale marginal spots.

Following is a list of the specimens with labels and collector's notes quoted in full:

"Station 41x, C.A.E. On just dead *Cottus scorpius* L. Bernard harbour, Northwest Territories. End of August, 1915. F. Johansen, coll." Four small ones.

"Station 42m, C.A.E. On just dead *Cottus scorpius* L. Bernard harbour, Northwest Territories. Dark purple. F. Johansen, coll." Three full grown specimens.

"Station 49g, C.A.E. On skin of dead *Cottus scorpius* L. Bernard harbour, Northwest Territories. June 15, 1916. F. Johansen, coll." Twelve specimens of various sizes.

#### *Oxytonostoma typica* Malm.

A single specimen having exactly the appearance of Malm's figure of *Pontobdella granulifera* with which this species is probably identical.

Length 22.5 mm., maximum width (behind middle) 4 mm. The body is strongly fusiform and in the posterior region slightly flattened but strictly terete anteriorly. Much enlarged caudad of the middle and tapered to the very narrow anterior region which immediately behind the oral disc measures only one-tenth of the greatest diameter. Posteriorly it tapers less, the width at the anus being about one-fourth of the maximum. Oral sucker small and very deeply cupped. No eyes. Caudal sucker neither deeply concave nor strongly expanded, being about one-half the maximum diameter.

Somites in the middle region are strongly marked, as though the body cavity were extensively developed and subdivided by dissepiments, as in earthworms. Twelve such are very distinct but the constrictions fade out toward the caudal end. There is here no trace of annulation. In the slender anterior region the somites are less distinct but there is some trace of annulation which extends onto the head also. On the ventral surface of the anterior half of the posterior region are six pairs of rather conspicuous, low, rounded elevations situated just behind the constrictions. In the center of each appears a small orifice (nepriopore?).

The integument presents a peculiar shiny surface as though covered by a thick cuticle like a tapeworm on which no papillae, granules or sensillae are visible. It is of a dirty brownish color, stained dark purple or slaty at the slight constrictions. The peculiar appearance is probably due to the stretching of the integuments as a result of extreme gorging of the digestive tract with blood.

"Station 41. C.A.E. Bernard harbour, Northwest Territories. 3-5 fathoms. July 20, 1915 (dark purple). F. Johansen, coll." One specimen.

#### *Platybdella* sp.

The Victoria Memorial Museum at Ottawa also contains a fish leech from the *Neptune* Expedition. It is poorly preserved and cannot be determined by me.

Length 13.5 mm., width at middle 1.4 mm., diameter of caudal sucker 1.5 mm. No eyes. Caudal sucker prominent, thin and repand. No eye-spots. Somite appear to be triannulate with traces of the secondary furrows.

"From *Schrocrangon boreas* (Phipps). *Neptune* Exp. 1903-04."

ADQ7359



3 9004 02404499 9

# Report of the Canadian Arctic Expedition, 1913-18.

## VOLUME VIII: MOLLUSKS, ECHINODERMS, COELENTERATES, ETC.

- Part A: MOLLUSKS, RECENT AND PLEISTOCENE. By William H. Dall. *(Issued September 24, 1919).*
- Part B: CEPHALOPODA AND PTEROPODA.
  - Cephalopoda. By S. S. Berry-Berry.
  - Pteropoda. By W. F. Clapp. *(In preparation).*
- Part C: ECHINODERMS. By Austin H. Clark. *(Issued April 8, 1920).*
- Part D: BRYOZOA. By R. C. Osburn. *(In preparation).*
- Part E: ROTATORIA. By H. K. Harring. *(In preparation).*
- Part F: CHAETOGNATHA. By A. G. Huntsman. *(In preparation).*
- Part G: ACTINOZOA AND ALCYONARIA. By A. E. Verrill. *(In press).*
- Part H: MEDUSAE AND CTENOPHORA. By H. B. Bigelow. *(Issued June 30, 1920).*
- Part I: HYDROIDS. By McLean Fraser. *(In preparation).*
- Part J: PORIFERA.

## VOLUME IX: ANNELIDS, PARASITIC WORMS, PROTOZOANS, ETC.

- Part A: OLIGOCHAETA.
  - Lumbriculidae. By Frank Smith.
  - Enchytraeidae. By Paul S. Welch. *(Issued September 20, 1919).*
- Part B: POLYCHAETA. By Ralph V. Chamberlin. *(In press).*
- Part C: HIRUDINEA. By J. P. Moore. *(In preparation).*
- Part D: GEPHYREA. By Ralph V. Chamberlin. *(Issued June 20, 1920).*
- Part E: ACANTHOCEPHALA. By H. J. Van Cleave. *(Issued April 7, 1920).*
- Part F: NEMATODA. By N. A. Cobb. *(In preparation).*
- Part G-H: TREMATODA AND CESTODA. By A. R. Cooper. *(In press).*
- Part I: TURBELLARIA. By A. Hassell. *(In preparation).*
- Part J: GORDIACEA.
- Part K: SPOROZOA. By J. V. Mavor. *(In preparation).*
- Part M: FORAMINIFERA. By J. A. Cushman. *(Issued February 6, 1920).*

## VOLUME X: PLANKTON, HYDROGRAPHY, TIDES, ETC.

- Part A: PLANKTON. By Albert Mann. *(In preparation).*
- Part B: MARINE DIATOMS. By L. W. Bailey. *(In preparation).*
- Part C: TIDAL OBSERVATIONS AND RESULTS. By W. Bell Dawson. *(Issued October 1, 1920).*
- Part D: HYDROGRAPHY. *(In preparation).*

## VOLUME XI: GEOLOGY AND GEOGRAPHY

- Part A: THE GEOLOGY OF THE ARCTIC COAST OF CANADA, WEST OF THE KENT PENINSULA. By J. J. O'Neill. *(In preparation).*
- Part B: MAPS AND GEOGRAPHICAL NOTES. By Kenneth G. Chipman and John R. Cox. *(In preparation).*

## VOLUME XII: LIFE OF THE COPPER ESKIMOS

- THE LIFE OF THE COPPER ESKIMOS. By D. Jenness. *(In press).*

## VOLUME XIII: PHYSICAL CHARACTERISTICS AND TECHNOLOGY OF THE COPPER ESKIMOS

- Part A: THE PHYSICAL CHARACTERISTICS OF THE COPPER ESKIMOS. By D. Jenness (in part). *(In preparation).*
- Part B: TECHNOLOGY OF THE COPPER ESKIMOS. *(To be prepared).*

## VOLUME XIV: ESKIMO FOLK-LORE AND LANGUAGE

- Part A: FOLK-LORE, WITH TEXTS, FROM ALASKA, THE MACKENZIE DELTA, AND CORONATION GULF. By D. Jenness. *(In preparation).*
- Part B: COMPARATIVE GRAMMAR AND VOCABULARY OF THE ESKIMO DIALECTS OF POINT BARROW, THE MACKENZIE DELTA, AND CORONATION GULF. By D. Jenness. *(In preparation).*

## VOLUME XV: ESKIMO STRING FIGURES AND SONGS

- Part A: STRING FIGURES OF THE ESKIMOS. By D. Jenness. *(Ready for press)*
- Part B: SONGS OF THE COPPER ESKIMOS. By D. Jenness (in part). *(In preparation).*

## VOLUME XVI: ARCHAEOLOGY

- CONTRIBUTIONS TO THE ARCHAEOLOGY OF WESTERN ARCTIC AMERICA. *(To be prepared).*



