

**ARISTOTLE'S
RESEARCHES IN
NATURAL SCIENCE**

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Aristotle's researches in natural science by Thomas East Lones

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THOMAS EAST LONES

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PREFACE.

ARISTOTLE'S researches in Natural Science are set forth in a series of his works, some of which have already received a great deal of attention, while the rest have been much neglected. Translations, with or without explanatory notes, of all these works have been produced in English, French, German, or Latin, and separate treatises or papers discussing Aristotle's researches in one or more branches of Natural Science have been published from time to time. Among such treatises and papers may be mentioned J. Müller's *Über den glatten Hai des Aristoteles, &c.*, Berlin, 1842, a folio volume with six plates, relating, in part, to the placental cartilaginous fishes of Aristotle; J. B. Meyer's *Aristoteles Thierkunde, Ein Beitrag zur Geschichte der Zoologie, Physiologie, und alten Philosophie*, Berlin, 1855; H. Aubert's *Die Cephalopoden des Aristoteles, &c.*, Leipzig, 1862, 39 pp.; C. J. Sundevall's *Die Thierarten des Aristoteles von den Klassen der Säugethiere, Vögel, Reptilien und Insekten*, Stockholm, 1863; G. H. Lewes' *Aristotle: A Chapter from the History of Science*, London, 1864; and Dr. J. Young's paper "On the Malacostraca of Aristotle," published in *The Annals and Magazine of Natural History*, 1865. There are also several works and papers which incidentally give valuable assistance in the study of Aristotle's researches in Natural Science, e.g. Cuvier and Valenciennes' *Histoire Naturelle des Poissons*, Paris, 1828-49; J. L. Ideler's *Meteorologia veterum Græcorum et Romanorum*, Berlin, 1832; Spratt and Forbes' *Travels in Lycia, &c.*, London, 1847; Hoffman and Jordan's "Catalogue of the Fishes of Greece, with Notes on the Names now in Use, and those Employed by Classical Authors," published in the *Proceedings of the Academy of Sciences of Philadelphia*, for 1892; D'A. W. Thompson's *Glossary of Greek Birds*, Oxford, 1895; and T. Gill's "Parental Care among Fresh-water Fishes," published in the *Annual Report of the Smithsonian Institution*, Washington, 1906.

A consideration of these and many other similar publications seems to show that a single work, re-examining Aristotle's statements, as far as possible by first-hand investigations, and utilizing the results attained by the above-mentioned and other scholars, would fill a gap in Aristotelian literature. The present work is intended to do this, and represents the nature and value of Aristotle's researches in subjects now considered to belong to physical astronomy, meteorology, physical geography, physics, chemistry, geology, botany, anatomy, physiology, embryology, and zoology. In those parts of the work relating to his anatomical, embryological, and zoological researches, I have tested his statements, whenever possible, by means of actual dissections of the parts of, and observations on, the animals to which he seems to refer.

Throughout this work full references are given to all passages from ancient and modern writers cited. It is hoped that these references will be sufficient to enable the reader to form his own estimate of the statements made or opinions expressed in the course of the work.

As the various Greek texts present differences in method of division as well as in reading, it is necessary to state that the numerous references to Aristotle's works are to the following Greek texts:—Schneider's edition of the *History of Animals*, Aubert and Wimmer's edition of the *Generation of Animals*, the Teubnerian editions of the *Parts of Animals*, *Parva Naturalia*, *De Anima*, *De Cælo*, and *De Generatione et Corruptione*, and, with very few exceptions, Didot's editions of the remaining works. The references to Aristotelian treatises, e.g. the *De Plantis*, not usually considered to have been written by Aristotle, are to Didot's editions.

The abbreviations *H.A.*, *P.A.*, and *G.A.*, have been used frequently to denote Aristotle's *History of Animals*, *Parts of Animals*, and *Generation of Animals*, respectively.

It should be understood that the identifications of animals, attempted in various parts of the work, are not necessarily complete, e.g. *Apous* or *Kypsellos* (see p. 245) probably included other birds besides the swift and house-martin, and *Tigris* (see p. 257) included other wild animals besides the tiger of western India. This is evident from passages in Arrian's *Historia Indica*, c. 15, ss. 1 and 3, which read: "Nearchus says that he has seen a tiger's skin, but not a real tiger. . . . and that every one of the

animals which we see and call 'tigers' are jackals, speckled and larger than common jackals."

Except in a few cases, *e.g.* that of the *Hippelaphos*, pp. 253-4, no attempt has been made to consider the possibility of identifying Aristotle's animals with those which may reasonably be assumed to have been unknown to the Ancients.

A few words about the illustrative drawings may not be out of place. Of these, Fig. 3 is of a different kind from the rest. It is drawn according to specific directions given in Aristotle's *Meteorology*, and probably agrees with a drawing forming part of Aristotle's original MS. There are no drawings in the Greek texts, but in many passages there are clear references to drawings.

My thanks are due to Mr. A. R. Wright, Hon. Editor of *Folk-Lore*, for reading the MS. and proof, and for information chiefly relating to popular beliefs recorded by Aristotle; to Mr. F. W. Dunn, B.A., B.Sc., for reading a large part of the MS.; to Mr. F. J. Cheshire, Lecturer in Physics at Birkbeck College, and Mr. R. J. Sowter, B.Sc., for reading all parts of the MS. and proof of Chapters iii. and iv. relating to phenomena of light, heat, and sound; to Mr. F. Gossling, B.Sc., for reading the proof of Chapters v. and vi.; and to my son, Mr. P. E. Lones, for reading those parts of the MS. and proof of Chapters viii.-xiv., relating to human anatomy and physiology.

T. E. L.

DUDLEY HOUSE,
KINGS LANGLEY,
HERTS.

CONTENTS.

| CHAPTER | PAGE |
|---|------|
| I.—INTRODUCTORY - - - - - | 1 |
| II.—ARISTOTLE'S METHOD OF INVESTIGATING THE NATURAL SCIENCES - - - | 21 |
| III.—CELESTIAL, ATMOSPHERIC, AND TERRES- TRIAL PHENOMENA - - - - | 28 |
| IV.—PHENOMENA OF LIGHT AND COLOUR, HEAT AND SOUND - - - - - | 61 |
| -V.—DISTINCTION BETWEEN ANIMALS, PLANTS, AND INANIMATE MATTER - - - | 79 |
| -VI.—CONSTITUENTS OF ANIMALS, PLANTS, AND INANIMATE MATTER - - - - | 88 |
| VII.—ON PLANTS - - - - - | 95 |
| -VIII.—THE PROBABLE NATURE AND EXTENT OF ARISTOTLE'S DISSECTIONS - - - | 102 |
| IX.—ARISTOTLE'S HOMŒOMERIA - - - | 107 |
| X.—ARISTOTLE'S ANHOMŒOMERIA AND THEIR FUNCTIONS - - - - - | 118 |
| XI.—ARISTOTLE'S ANHOMŒOMERIA AND THEIR FUNCTIONS (<i>continued</i>) - - - - | 148 |
| XII.—ARISTOTLE'S ANHOMŒOMERIA AND THEIR FUNCTIONS (<i>continued</i>) - - - - | 173 |

| CHAPTER | PAGE |
|--|------|
| XIII.—ANIMAL MOTION - - - - - | 188 |
| XIV.—GENERATION AND DEVELOPMENT - - - | 195 |
| XV.—CLASSIFICATION OF ANIMALS - - - | 208 |
| XVI.—ARISTOTLE'S ANAIMA, OR ANIMALS WITH- OUT BLOOD - - - - - | 216 |
| XVII.—ARISTOTLE'S ENAIMA, OR ANIMALS WITH BLOOD - - - - - | 229 |
| XVIII.—ARISTOTLE'S ENAIMA, OR ANIMALS WITH BLOOD (<i>continued</i>) - - - - - | 250 |

ILLUSTRATIVE DRAWINGS.

- FIG. 1.—APPEARANCE OF RAINBOWS, AS SEEN AT ATHENS.
- „ 2.—ARRANGEMENT OF THE COLOURS OF RAINBOWS, ACCORD-
ING TO ARISTOTLE.
- „ 3.—ARISTOTLE'S COMPASS.
- „ 4.—GRADATION FROM INANIMATE MATTER THROUGH LOWER
TO HIGHER FORMS OF LIFE.
- „ 5.—ARISTOTLE'S ELEMENTS AND THEIR RELATIONS.
- „ 6.—LEFT ASTRAGALUS OF A SHEEP.
- „ 7.—BONES FROM THE HEART OF A THREE-YEAR OLD OX.
- „ 8.—HEART AND BLOOD-VESSELS, ACCORDING TO ARISTOTLE.
- „ 9.—EGG OPENED AFTER EIGHT DAYS' INCUBATION.
- „ 10.—CHICK REMOVED FROM EGG AFTER TEN DAYS' INCUBA-
TION.