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**A history of British animals : exhibiting the descriptive characters and systematical arrangement of the genera and species of quadrupeds, birds, reptiles, fishes, mollusca, and radiata of the United Kingdom; including the indigenous, extirpated, and extinct kinds, together with periodical and occasional visitants /**

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A

HISTORY  
OF  
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DESCRIPTIVE CHARACTERS AND SYSTEMATICAL  
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OF  
THE GENERA AND SPECIES OF QUADRUPEDS, BIRDS,  
REPTILES, FISHES, MOLLUSCA, AND RADIATA  
OF THE UNITED KINGDOM;

INCLUDING  
THE INDIGENOUS, EXTIRPATED, AND EXTINCT  
KINDS, TOGETHER WITH PERIODICAL  
AND OCCASIONAL VISITANTS.

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BY  
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MINISTER OF FLISK, FIFESHIRE;  
AND AUTHOR OF THE "PHILOSOPHY OF ZOOLOGY."

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## P R E F A C E.

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THE study of British Zoology is peculiarly attractive to the intelligent observer of nature in this country, by the facility with which many species, in the different groups of animals, can be procured for accurate examination. Their forms, structure, and successive developement, can be traced in detail, together with the functions which they exercise, and the various circumstances by which they are controlled. In this manner just conceptions of the laws of organization, and the limits to the distribution of the species, may be acquired, and the mind qualified for speculating on the more extended relations of the animal kingdom. A valuable collection of facts will likewise be secured, by which the most fascinating generalisations may be tested—those productions which, like a map, should always be received with suspicion, if inaccurate within the sphere of individual observation.

These views have long exercised an influence in this country, and given rise to those various attempts to enumerate and describe British animals, which, for more than a century, have been presented in succession to the public. During this extended interval, the science of zoology has experienced several remarkable changes, each producing a corresponding effect on the British Fauna. If anatomy and physiology be regarded as the basis of zoological science, the history of species will include a description of their structure and functions, along with their external characters. If anatomy and physiology be discarded as foreign to the subject, and the professed naturalist acknowledge, without a blush, his ignorance or his contempt of both, then the history of species will be chiefly occupied with the details of external appearance. Such different conditions have pre-

vailed in the science of zoology in this country, and justify the division of its history into two great eras, the general features of which it may be proper here briefly to notice.

The first of these periods in the history of zoological science in Britain, may be denominated the PHYSIOLOGICAL ERA. In this golden age WILLOUGHBY, RAY, LISTER and SIBBALD conspicuously distinguished themselves. These illustrious individuals duly appreciated the value of anatomy as a guide in zoological inquiries; and while they studied the forms of animals in connection with their structure, they were not unmindful of their functions and distribution. The whole extent of the animal kingdom occupied their attention, and they were induced to collect materials from every quarter. But while thus engaged, they were sedulous in the investigation of the productions of their own country. The number of indigenous species which they procured and described, is a proof of their diligence, and enabled them to impart a degree of maturity to the British Fauna at that early period, which is still calculated to excite our admiration.

The labours of these luminaries of the science in determining the characters of British Animals, were preceded by the publication in 1667 of the “*Pinax Rerum Naturalium Britannicarum*” of Dr CHRISTOPHER MERRET. This small work, which, though it claims little more than the merit of a catalogue, exhibits many proofs of great diligence, and rises in importance, when viewed as a first attempt at the construction of a British Fauna.

The history of MAMMIFEROUS Animals was undertaken by JOHN RAY, and the results published in 1693, in the *Synopsis methodica Animalium, Quadrupedum, et Serpentini generis*. In this work, the forms of the native species are described with much accuracy, together with many interesting anatomical details. Few opportunities had occurred to this author, or to his friend WILLOUGHBY, of examining the Cetaceous species. This deficiency, however, was well supplied by Sir ROBERT SIBBALD, a naturalist who, besides contributing greatly to the elucidation of the productions of his native country by his *Scotia Illustrata, sive*

*Prodromus Historiae Naturalis*, &c. Edin. 1684, and his *History ancient and modern of the Sheriffdoms of Fife and Kinross*, Edin. 1710 (the 8vo edition, Cupar, 1803, is the one now generally quoted), had bestowed much attention on the characters of the different kinds of whales which had been captured in the Scottish seas, or stranded on various parts of the coast. His *Phalainologia Nova*, Edin. 1692, rescued this department of zoology from the obscurity in which it had previously been involved. A reprint of this work, at the instigation of Mr PENNANT, took place in 1773, and is the edition now in general circulation.

The BIRDS of Britain were enumerated and described with great precision in the *Ornithologia* of FRANCIS WILLOUGHBY, a work edited, after the death of the worthy author, by RAY in 1676. An English translation was at the same time published, with some additions; and, in 1713, an abridgement made its appearance, under the title *JOANNIS RAI Synopsis methodica Avium; opus posthumum*; edited by the venerable DERHAM.

The native REPTILES are few in number, and are well described by RAY in the Synopsis already referred to. Few additions of any value by subsequent authors have hitherto been communicated.

FISHES occupied the attention of WILLOUGHBY. His *Ichthyologia*, as edited by RAY, Oxford 1686, is a work of great labour; and the descriptions, especially of British species, are models of precision. A few additions were afterwards made to this division of the British Fauna by RAY in his *Synopsis methodica Piscium*, London 1713, chiefly from the contributions of the Rev. GEORGE JAGO of Loo.

While the History of the Vertebral Animals was thus assiduously cultivated by individuals well qualified for the task, the Invertebral kinds were not overlooked. \*

The MOLLUSCA were diligently investigated by MARTIN LISTER, and the descriptions of many species in the *Cochlearum Angliae Historia*, which forms a part of his *Historia Animalium Angliae*, London 1678, are minute and illustrative. But the greatest service which LISTER rendered to this department of science arose from the publication in 1685 of his *Historia sive Synopsis methodica Conchyliorum*. The plates of this valuable

treatise exceed a thousand in number, and were executed with taste and accuracy by the author's accomplished daughters, ANN and SUSAN. Two editions of this work, the one by the Reverend WILLIAM HUDDESFORD, and the other more recently by MR DILLWYN, are those now generally referred to.

Among the Annulose animals, the SPIDERS had early attracted the notice of LISTER, and his descriptions of the species, as published in the first part of his *Historia Animalium Anglie*, are still unrivalled. The study of Entomology had been facilitated, to a certain extent, by the appearance of the *Theatrum Insectorum* of MOUFET, London 1634; but it is to the *Historia Insectorum* of RAY, London 1710, to which LISTER furnished a valuable contribution, that the science was chiefly indebted for its early success, and the popularity which it still maintains among the naturalists of England.

The true nature of the ZOO PHYTES was but imperfectly comprehended by zoologists throughout the period in which the eminent individuals, now enumerated, continued to flourish. At length, however, this interesting group of animals received ample illustration from the meritorious labours of JOHN ELLIS, whose *Essay towards a Natural History of the Corallines*, London 1755, may be regarded as the last of the productions of the old school of British Physiologists.

It is painful to advert to the second era of British Zoology, during which the ARTIFICIAL METHOD of LINNÆUS occupied that place which physiology had so successfully filled. We must be careful, however, to make a distinction between the precepts and example of LINNÆUS himself, and the conduct of his blind admirers. LINNÆUS regarded the Natural Method, which contemplates form, structure, and function, as the ultimate object of the science of Zoology. His Artificial System, in which external appearances were exclusively employed, was devised as a convenient instrument of research to guide the student in attaining higher objects. Too many of the followers of the illustrious Swede, in this country, seem to have viewed the Artificial Method, not as the instrument, but the object aimed at,—overlooked results in physiology which industry had already secured, and presented the science under an aspect which a cultivated mind could not relish, and in which an or-

dinary observer could perceive little utility. In this retrograde movement of British naturalists Mr PENNANT led the way, and the completion of his *British Zoology*, in four volumes, in 1777, gave a new aspect to the science in this country. This naturalist possessed favourable means for study, and no inconsiderable share of industry; but being rather deficient in a knowledge of physiology, he unfortunately seems to have undervalued all that his predecessors had gleaned in that fruitful field, and confined his labours chiefly to an acquaintance with the external characters of animals. He succeeded in imparting to his writings a considerable degree of popularity, by avoiding all minute details, and introducing occasional remarks on the habits of particular species; and by allusions to Greek and Roman authors, he interested the classical reader. In his account of the Vertebral Animals, his materials were chiefly derived from the writings of WILLOUGHBY, RAY, and SIBBALD, while LISTER supplied the groundwork of the Shells. It is in the class Crustacea that Mr PENNANT appears chiefly as an original author, earning reputation in a department of the science which his predecessors had in a great measure neglected. The Spiders, Insects, and Zoophytes, did not engage his attention.

In order to facilitate the researches of the student of British zoology, Dr BERKENHOUT published abridged characters of the species in 1769, under the title “*Outlines*,” &c. and a third edition more enlarged, in 1795, included in the “*Synopsis of the Natural History of Great Britain and Ireland*.” In the first volume of this work, the characters of the species of British Animals are drawn up with a degree of care and accuracy unequalled in any subsequent publication of a similar kind. In 1802 Mr STEWART attempted a similar work, on a more enlarged plan, in two volumes, entitled *Elements of the Natural History of the Animal Kingdom*. This work includes, besides the British species, the characters of the more common genera of foreign animals. A new edition appeared in 1817, deficient, however, in the account of the more recently published species, and in some instances faulty by introducing the same species twice under different genera.

In the translation of GMELIN's edition of LINNÆUS's System of Nature, London 1802, Dr TURTON has marked with an asterisk all the species which he considered as indigenous to Britain. This list is by far the most extensive of any which has yet appeared. The same industrious naturalist commenced in 1807 a *British Fauna*, including the classes Mammalia, Birds, Amphibia, Fishes, and Worms. He has since still further illustrated the Shells of this country in his *Conchological Dictionary*, and his still more valuable *Bivalvia Britannica*.

Besides the authors now referred to, who aimed at the completion of systems of British Zoology, other naturalists, equally the followers of the Artificial Method, directed their attention to the elucidation of particular tribes of indigenous animals. As works of luxury in this department, may be noticed the figures published by ALBIN, EDWARDS, LEWIN, and last of all those of DONOVAN, whose various publications have greatly contributed to advance the interests of the science, by facilitating the *naming* of species.

But there were other labourers during this era, whose efforts assumed a more scientific aspect. The late GEORGE MONTAGU, Esq. of Knowle House, Devonshire, cultivated with zeal many departments of British Zoology. In 1802 he published his *Ornithological Dictionary*, which contained a few amended characters of species, and some new observations on their economy. In 1813 a *Supplement* to this Dictionary appeared, in which the author exhibited a more intimate acquaintance with his subject, traced the effects of age, sex, and season on the plumage of birds, and exposed many mistakes in the establishment of species, which had been committed from a want of attention to these circumstances. But Mr MONTAGU's labours were not confined to Ornithology. In 1803 the publication of his *Testacea Britannica* contributed greatly to extend a knowledge of the number and characters of the native Molluscous animals, and which was still further augmented by the *Supplement* to the same work, which appeared in 1808. It is but a just tribute to the candour of this naturalist to state, that in his writings he appears, progressively, to have been forsaking the Artificial Method, and acquiring a

keener relish for physiological researches. That truth was at all times eagerly sought after, a frequent correspondence with the author during several years furnished suitable opportunities for ascertaining.

In the science of Entomology, several meritorious efforts were at this time made to illustrate the characters of the native species. The *Entomologia Britannica* of MARSHAM, London, 1802, embraced the extensive tribes of Coleopterous Insects, and in which he described many new species, and greatly elucidated the characters of those previously known. In the following year, MR HAWORTH commenced his *Lepidoptera Britannica*, a work containing much important information; but now, from its scarcity, of difficult access to the student.

It was not to be expected in a country in which such anatomists as HARVEY and TYSON, and such zoologists as WILLOUGHBY, RAY, LISTER, and SIBBALD had flourished, that the Artificial Method would universally supersede the study of the anatomy and physiology of animals. During this dark age, one individual, JOHN HUNTER, upheld, in his own labours, the dignity of the science, and left behind him a *museum* which, to this period, is unrivalled as a display of zeal, patience, and physiological attainment. At the same period, the University of Edinburgh possessed, in Dr MONRO *secundus*, a comparative anatomist and physiologist, anxious to inspire a taste for the science in the minds of his numerous pupils, and to extend its boundaries by personal exertion.

Even among the naturalists of this country, there were always a few whom the fetters of the Linnean school could not bind; but whose labours were too confined in their object, to exercise any general influence on the spirit of the age. MR KIRBY, in his *Monographia Apum Angliae*, Ipswich, 1802, set an example to his countrymen of acuteness and patience in unfolding the structure and habits of those insects to which he had directed his attention; and he has recently increased his claims to the gratitude of British naturalists, by composing, along with MR SPENCE, the *Introduction to Entomology*. In another quarter of the island, MR DALYELL, in his *Observations on Planariæ*, Edin. 1814, exhibited a happy facility of investigating the habits of aquatic

animals, and many valuable results yet remain in his possession, which it is hoped he will soon communicate to the public.

The circumstance, however, which contributed, in the greatest degree, to restore the science to its former dignity, in this country, arose from the influence of the writings of the continental naturalists. Unrestricted by those trammels which had paralysed the exertions of British zoologists, they had followed in the track of the Natural Method, under the banners of REAUMUR, DEGEER, MULLER, DAUBENTON, and FABRICIUS; and more recently under the guidance of BLUMENBACH, RUDOLPHI, TEMMINCK, CUVIER, LATREILLE, and SAVIGNY. A comparison of the productions of these modern observers, with those of the disciples of the Linnean school, could not fail to exhibit the former in a favourable light, and gain converts to the pursuits of physiology. In this new field, Dr LEACH has occupied a prominent place. His situation as zoologist to the British Museum, furnished him with invaluable facilities; and there are few unacquainted with the successful results. He began by publishing several articles on annulose animals, in the Edinburgh Encyclopædia, and the Supplement to the Encyclopædia Britannica, which have been republished, under his inspection, by Mr SAMOUELLE, in the *Entomologist's Useful Compendium*, London, 1819. The *Zoological Miscellany* was begun by Dr LEACH, in 1814; and, in the following year, the *Malacostraca Podophthalmata Britanniæ*, imparted a new character to an obscure branch of British Zoology. He had likewise, in considerable forwardness, a *Mollusca Britannica*. It is deeply to be regretted, that indisposition has hitherto prevented its publication, since it is confidently believed that his labours in this field would have removed much of that uncertainty which still prevails in the classification of molluscous animals.

The Insects of Britain are at this moment receiving ample illustration, according to the modern improvements of the science, in two works, in the course of publication. In the *British Entomology* of Mr CURTIS, there is exhibited a fortunate dexterity in developing structure, accompanied with great accuracy of delineation. The *Illustrations of British Entomology*, by

Mr STEPHENS, is a work daily exhibiting the vast resources of his rich cabinet, and his discriminating acquaintance with the indigenous species.

Besides these displays of increasing attachment to the improvements which have been effected in the science, several circumstances have recently occurred in London, which seem calculated to promote the advancement of zoology in this country. The *Zoological Club*, instituted 29th November 1823, on the birth-day of RAY, will, it is hoped, give a new energy to those members of the Linnean Society, who devote their attention to the subjects of the animal kingdom. The establishment of a *Zoological Journal*, in 1824, is not without its interest, as indicating, we hope, an increasing demand for the truths of the science, and an anxiety to trace its progress. The *Zoological Institution*, organized 22d June 1825, under the auspices, and by the persevering exertions, of the late Sir STAMFORD RAFFLES, does honour to the spirit of the age. Botanic and Horticultural Gardens had long been established, and plants collected from various quarters for inspection, study, and application to purposes of utility or ornament. Now, the Animals of different countries will be subjected to similar treatment, and the happiest results may be anticipated. Nor can it be forgotten in this place, that a *Professorship of Zoology* has at last been instituted in the United Kingdom, and that the University of London has set the example.

Amidst so many displays of zoological zeal, it appeared to the author that a compendious view of the characters of British Animals would be useful in promoting the progress of the science, and as a substitute for more extended disquisitions. In 1822, he had ventured to publish the *Philosophy of Zoology*, in which it is attempted to collect and classify the truths of physiology, and to point out their importance in illustrating the characters of those groups into which animals have been divided. He there stated, that the FAUNA of a country should embrace Resident Animals, Periodical Visitants, Stragglers, together with the Extirpated, Extinct, and Naturalized Species. In the construction of the present Work, these important distinctions have been kept in view.

The *Resident Animals* are such as can accommodate them-

selves to all the changes of this variable climate. They are the only species which strictly merit the epithet *Indigenous*.

The *Periodical Visitants* chiefly belong to the class of Birds. Some of these come from more southern latitudes, to spend the summer, and bring forth their young; while others arrive from more northern latitudes, to escape the rigours of an arctic winter. The vernal shifting the author has denominated *Equatorial Migration*, the autumnal shifting the *Polar Migration*. All the species of these groups, though intimately connected with the country, by the regularity of their visits, enjoy a right of citizenship less perfect than the resident animals.

*Stragglers*, or irregular visitants, have hitherto occupied a higher rank in every British Fauna, than they seem entitled to possess. Driven from their native haunts to this country by some temporary calamity, the persecution of foes, or the fury of a storm, they have been recorded inconsiderately as indigenous species. Their occurrence, as serving to illustrate the distribution of species, should be recorded, but not in such a manner as to assimilate them with the resident kinds, and periodical visitors. Acting upon this principle, the author has been compelled to degrade to the rank of Stragglers, several Birds and Fishes which have long occupied a more distinguished place.

The *Extirpated Animals* are such species as still maintain their ground in other regions, but have been destroyed in this country by the long continued persecutions of man.

The *Extinct Animals* are such as once dwelt in this country, but which have disappeared, and, from various causes, seem to have perished from off the earth.

The remains of the extirpated animals, or such as history records to have lived in the country, are occasionally found imbedded in several of the superficial or modern strata, in company with the relics belonging to the yet indigenous species. Along with both of these, also occur the relics of several species, concerning which the voice of tradition is silent. Interred, however, in the same grave with the relics of individuals belonging to existing species, and such as have perished by human agency, and belonging to tribes which at all times have been the objects of the huntsman's pursuit; the author has referred their destruction to the *influence of the chase*, and has exhibited his views

on this subject in a paper in the 22d number of the Edinburgh Philosophical Journal, entitled "*Remarks illustrative of the Influence of Society on the Distribution of British Animals.*" Other observers, undervaluing the cause of extinction here assigned, have imagined, that the species referred to were destroyed by the agency of a violent DELUGE, which they consider as identical with the one recorded by MOSES. How this deluge could select a few species only as the objects of its vengeance, and leave in safety many species living in the same regions, and possessing nearly the same habits, is a difficulty which the abettors of the hypothesis have not yet ventured to explain. Should they attempt to account for the safety of the existing races, by supposing that they were preserved in the Ark, they have still to find proof of the law of exclusion, under the operation of which the now extinct kinds were denied protection. The extravagant pretensions of this hypothesis have been pointed out by the author, in a paper inserted in the 28th number of the Edinburgh Philosophical Journal, entitled "*The Geological Deluge, as interpreted by Baron CUVIER and Professor BUCKLAND, inconsistent with the Testimony of MOSES, and the Phenomena of Nature.*"

Among the extinct animals there are multitudes of species, the relics of which do not occur in the superficial strata, and are never associated with the remains of the extirpated or existing kinds. These are found imbedded in solid rock, and seem to have occupied the surface of the earth, when its physical condition and animal and vegetable productions differed greatly from the present order of things. By attending to the specific marks of these remains, the manner in which they are associated, and the strata in which they are imbedded, it is easy to discover that they do not all possess claims to the same degree of antiquity, and that they may be distributed into certain well marked *Zoological Epochs*. In the arrangement of the strata, inclosing these organic remains, there is a definite order of superposition, and there are characters likewise marking groups of different degrees of antiquity. Hence has arisen the idea of **GEOLOGICAL EPOCHS**, first distinctly intimated by LISTER and STENON, and elucidated by a host of subsequent observers.

These two kinds of epochs coincide, and thus directly intimate, that the revolutions which have taken place in the animal kingdom, have been produced by the changes which accompanied the successive depositions of the strata. The value of these remarks will be better understood by the following tabular view of the Geological Epochs.

PRINCIPAL EPOCHS.	PRIMARY DIVISIONS.	CHARACTERISTIC DEPOSITIONS.
I. Modern Epoch.	1. Detritus, ..... 2. Silt, ..... 3. Diluvium, ..... 4. Ice, ..... 5. Spring Deposits, ..... 6. Volcanic Deposits, .... 7. Meteorolites,.....	Soil. Sand-drift. Peat. { a. Lacustrine Silt. aa. Marine Silt. { a. Lacustrine Diluvium. { aa. Marine Diluvium. Polar Ice. Glaciers. Winter Ice. Sinter. Marl. Iron-Ore. Lava. Ashes.
II. Penult Epoch.	1. Upper Lacustrine Formation, ..... 2. Upper Marine For- mation,..... 3. Middle Lacustrine Formation,..... 4. Lower Marine For- mation,..... 5. Lower Lacustrine Formation,.....	Argillaceous Marl. Friable Sandstone. ----- Argillaceous Marl. Gypsum. Sandstone. London Clay. Clay. Marl. Sandstone. Plastic Clay. Lignite. Sand- stone.
III. Cretaceous Epoch.	1. Upper Marine For- mation, ..... 2. Lacustrine Forma- tion,..... 3. Lower Marine For- mation, .....	Chalk. Grey Marl. Green Sand. Argillaceous Ironstone. Lime- stone. Sandstone. Lignite. Upper. Middle, and Lower Oolites. Lias.
IV. Saliferous Epoch.	1. Variegated Sand- stone,..... 2. Magnesian Lime- stone,.....	Red Marl. Gypsum. Rock- Salt. Arenaceous Limestone. Calca- reous Conglomerate.
V. Carbonife- rous Epoch.	1. Coal, ..... 2. Red Sandstone, ..... 3. Grey Wacke,.....	Bituminous Shale. Coal. Grey Limestone. Grey Sand- stone. Clay Ironstone. Sandstone-Conglomerate. Red Sandstone. Red Limestone. Porphyry. Grey Wacke. Alum-Slate. Limestone.
VI. Primitive Epoch.	1. Slate,..... 2. Granite, .....	Mica Slate. Clay Slate. Chlorite Slate. Graphite. Gneiss. Hornblende Slate. Serpentine. Sienite. Quartz.

VI. *Primitive Epoch*.—The strata of this group support all the others, and appear therefore to be of antecedent formation. They do not contain any organic remains, and have been considered as formed prior to the existence of animals and vegetables on the earth.

V. *Carboniferous Epoch*.—During this æra, in which appear many marine and fresh-water deposits, the earth seems to have been peopled with a variety of animals and vegetables, of genera similar to those of the subsequent epochs. There are some genera, however, which seem to be peculiar to this æra, as *Orthocera*.

IV. *Saliferous Epoch*.—There are few organic remains connected with this æra, and no genera peculiar to it.

III. *Cretaceous Epoch*.—This era is characterised by the absence of the *Producti*, shells which abound in the carboniferous, and even occur, though sparingly, in the saliferous epoch ; and by the presence of the remains of the *Paddled Reptiles* and *Belemnites*, which do not exist in the strata of any anterior or subsequent epoch. Here the display commences of *Ammonites*, *Crustacea*, and the carnivorous canaliculated molluscous animals ; and here, for the first time, are exhibited proofs of the existence on the earth of insects, reptiles, birds, and even quadrupeds.

II. *Penultimate Epoch*.—In this group there are several genera of quadrupeds peculiar to it, as the *Palæotherium* and *Anoplotherium*, in forms, however, approximating to such as occur in the following group, and paving the way for the last and noblest creation, over which Man was destined to bear the sway.

I. *Modern Epoch*.—This era, in a zoological point of view, embraces Man, the existing races of animals and vegetables, and the few species now extinct, as the *Mammoth* and *Mastodon*, of which there is proof that they once were the contemporaries of the yet indigenous species.

It may be supposed, by some, that the preceding statements are at variance with the generally received interpretation of the account of the Creation, as given by MOSES. Four successive creations and extinctions of animals and vegetables are here re-

presented as having taken place previous to the existing order of things, and it is assumed that the present races of animals and vegetables, the companions of Man, did not exist on the globe during any of the antecedent epochs. But the most sincere friend of Revelation need be under no alarm, even should he be anxious to establish the authority of his Bible over a wider field than the Moral History of our race. If the Sacred Historian be considered as referring to the earlier æras in the commencement of his narrative only, “*In the beginning, God created the Heaven and the Earth,*” and to have contemplated, in what follows, the creation of the animals and vegetables of the Modern Epoch, it will be found that the deductions of science and the records of inspiration harmonize,—as the Word and the Works of GOD must do, if rightly interpreted. The question, indeed, lies within very narrow bounds. Are the Zoological and Geological Epochs established as *true* in science? If those who are qualified to judge shall pronounce in the affirmative, then must every *interpretation* of that brief portion of the sacred page, inconsistent therewith, be rejected as spurious, and the advocates of error consigned to occupy a page in the History of Prejudice, along with the persecutors of GALILEO.

There is one bed occurring in England, and fruitful in the remains of animals, denominated *Crag*, the relations of which seem as yet imperfectly understood. By some it is supposed to be identical with the upper marine formation of the Penult Epoch; by others as a newer deposite, but still older than any of the members of the Modern Epoch. Even in the 99th Number of the Mineral Conchology, Mr SOWERBY, under the article *Pecten reconditus*, seems to view it as of the same zoological era with the London Clay. Judging from specimens of recent species of shells from the Crag, and the evidence of portions of the bones of the mammoth, an extinct quadruped of the Modern Epoch, having been found associated with the shells, the author is inclined to view it as a *Marine Diluvium* belonging to the present era.

In the enumeration of British Animals contained in this volume, the author has referred to the extinct or fossil species so

frequently, as probably to have excited surprise in those accustomed to consult the more modern of the British Faunas. He was led to adopt this course, not for the purpose of filling up the chasms in the fancied laws of continuity, but that the attention of zoologists may be directed to an examination of the extinct races, and that the geologist may connect with his studies a knowledge of the character and distribution of existing species. The evils which have arisen from the want of this union between zoology and geology, are too obvious to require any comment. The neglect of the fossil species first appeared in the writings of Mr PENNANT, who took no notice of the numerous fossil species of shells and *echinodermata*, which, before the commencement of his labours, had been satisfactorily established. LISTER (to whom we owe the discovery that organic remains are distributed according to a plan, and that certain rocks may be characterised by their imbedded fossils, or that the distribution of organic remains, like the order of superposition of the strata, is regulated by fixed laws) perceived the importance of connecting a knowledge of the characters of the existing and fossil species, and exhibited the union in his *Historia Animalium Angliæ*. Under the protection of such authority, the author of this treatise is fearless of censure. He even confidently believes, that if the example of LISTER had been followed by succeeding contributors to the British Fauna, geology would have presented at this day an aspect of far greater maturity and interest. Even the characters of the fossil species of plants attracted the attention of the early observers, and led DA COSTA to "recommend to the curious in botany, to take notice of them as an *Appendix Plantarum ad-huc incognitarum*," (Phil. Trans. 50, 231.) But this advice has not been followed; for the student may search in vain the published *Introductions* to Botany, or the various *Floras* which have appeared, and fail to meet with even a hint to inform him that the various strata afford remains of extinct species of plants.

In reference to Fossil Shells, the author has chiefly quoted the specific characters given in the *Mineral Conchology* of Mr SOWERBY. This work is of great value in the facilities which

it affords for identifying relics of this kind. It is probable, however, that many of those shells now reputed species, will be found to be only varieties, by those who have it in their power to compare specimens from the same localities in different stages of growth. Perhaps not a few corrections are still necessary in regard to the physical distribution of the species.

In quoting the various works in which have been illustrated the characters of the recent species, a reference has been made to those editions which represent the latest improvements of the authors. Thus the 12th edition of the *Systema Naturæ* of LINNÆUS is referred to, instead of the compilation by Gmelin, which not unfrequently supplies its place. A similar plan has been followed with the writings of PENNANT, PULTENEY, and others. By pursuing this plan, the author has avoided the somewhat awkward custom of quoting the authority of LINNÆUS and others for the names of species established subsequent to their decease. The works which are referred to have likewise been quoted in a chronological order, for the purpose of pointing out the priority of the claims of the different observers, and the grounds of the preference given to particular generic or specific names.

Though the author has undergone a very great degree of labour in the construction of the present work, he has much reason to fear that it will be found imperfect even in reference to *published* species. It would give him sincere pleasure to have either his mistakes or omissions pointed out, nor will he conceal his anxiety to obtain information respecting the discovery of new species. The great extent and variety of those publications in which the discoveries of observers may be recorded, forbid any compiler, however industrious, to fancy that he has collected all the scattered documents of the science. The author, however, has done his best, situate as he is at a great distance from personal intercourse with zoologists, and opportunities of consulting the journals of the day, and in a great measure confined to an examination of those works which constitute his own limited library. He is aware that, by employing the common practice of copying synonimes, he might have concealed these imperfections. He has made a different choice,

and quoted only the works which he has consulted ; except in a few instances, where it appeared requisite to refer to certain authors whose works he has not seen, but in such circumstances the reference is enclosed by ( ), and precedes the title of the work whence it was extracted, so as to leave no risk of mistake.

While the author, as a compiler, has cause to lament the infirmities under which he has laboured, he trusts to be forgiven, if he ventures, as a compensation for acknowledged defects, to prefer some claims on the confidence of the reader. He has received many valuable contributions from kind friends, whose favours he trusts he has not been reluctant to acknowledge. He has long been a practical observer of British Animals, or what a friend of the Honourable DAINES BARRINGTON used to term an Out-door Naturalist. This circumstance has enabled him to correct the specific characters of several animals, and to point out with greater accuracy their habits and distribution, to suppress several spurious species, and to give to the synonimes, in many cases, a greater degree of precision. He trusts the *additions* to the British Fauna which he has here contributed will not at the same time be overlooked.

In the description of species, the author has seldom indulged in physiological details or delineations of instinct. He refers to his Philosophy of Zoology, to which the present work is destined to serve as an adjunct, for ample illustrations on these subjects. To the same quarter he must direct the reader who wishes to comprehend more fully the principles of the *Dichotomous Method*, which he has followed throughout. He is aware that the *Quinary and Circular Disposition of Animals* proposed by Mr MACLEAY, has several followers. This novel method, however, seems to have originated in metaphysical prejudices, and by overlooking the fact, that, in the various organs and their numerous modifications, belonging to each species, there are characters which enable the physiologist to trace resemblances in structure and function with the organs of many other species : So that the same animal may occupy a place in many different physiological groups, and yield the most convenient facilities to those who intend to arrange the species according to any preconceived plan.

It is still the author's intention to proceed farther in the execution of the task which he has undertaken, and to communicate to the public a description of the remaining tribes of British Animals. In the mean time, he trusts that the present work, with all its imperfections, will increase the facilities of the student of British Zoology, and probably be the means of exciting those who are in possession of more accurate information to reveal their success to the public. Recollecting the difficulties which occurred to himself in the discrimination of species, the author has, in the course of his work, studied simplicity, precision, and brevity, that he might contribute to remove obstacles to an acquaintance with a science which has long yielded him gratifying instruction and amusement, and presented so frequently to his notice the brightest exhibitions of the wisdom of his MAKER.

MANSE OF FLISK,  
27th December 1827.

## ACALEPHA.

I. Sect.—Fixed; the base, opposite the mouth, adhering to other bodies.

A. *Tentacula surrounding uninterruptedly the oral disc.*

Actinea.

Mammaria.

AA. *Tentacula on the margin of the oral disc disposed in tufts.*  
Lucernaria.

II. Sect.—Free; the base opposite the mouth incapable of adhering to other bodies.

A. *Body closed opposite the mouth.*

a. Body strengthened internally by a cartilaginous plate.  
Veabella.

aa. Body destitute of an internal cartilaginous plate.

b. A mouth in the centre of the oral disc.

c. Destitute of lateral cavities.

Eulimena.

Geryonia.

cc. With four lateral cavities, or ovaries.

Cyanea.

bb. Destitute of a mouth in the centre.

Rhizostoma.

Cassiopea.

AA. *Body open at both extremities.*

Beroe.

Pleurobrachia.

GEN. XVI. ACTINEA.—Base with the disc capable of shifting place; mouth terminal, retractile; tentacula numerous.

41. A. *equina*.—Body smooth, finely wrinkled transversely; margin of the disc with a row of tubercles.

A. *equina*, Linn. Syst. i. 1088.—*Hydra disciflora*, *tentaculis retractilibus, extimo disci margine tuberculato*. *Gaertner*, Phil. Trans. 1761, t. i. f. 5. *Dicgemare*, Phil. Trans. 1773, 364. t. xvi. f. 1.—A. *hemisphaerica*, *Penn. Brit. Zool.* iv. 50.—A. *mesembryanthemum*, *Turt. Brit. Fauna*, 131.—A. *rufa*, *Stewart's El.* i. 393.—Common, adhering to rocks.

Body, when contracted, hemispherical, red or brown, smooth; base blackish-grey, with unequal, tubercular, diverging ridges, the margin with a purple ring; tentacula numerous, lengthened, of the colour of the body, or variegated; exterior to which, there is a ring of about twenty purple tubercles; the margin of the mouth is slightly tinged with purple.

42. *A. senilis*.—Body rough, with numerous rows of glandular warts, tentacula shorter than the body.

*Hydra disciflora*, tentaculis retractilibus subdiaphanis; corpore cylindrico, miliaribus glandulis longitudinaliter striato, *Gaert. Phil. Trans.* 1761, 82. t. i. f. 4.—*A. senilis*, *Linn. Syst. i.* 1088. *Dicq. Phil. Trans.* 1773, 866. t. xvi. f. 10.—*A. verrucosa*, *Penn. Brit. Zool. iv.* 49.—*A. crassicornis*, *Adams, Linn. Trans. iii.* 252.—*A. equina*, *Sower. Brit. Misc. t. 4*.—*A. gemmacea*, *equina* and *crassicornis*, *Turt. Brit. Fauna*, 130, 131.—*A. crassicornis*, *Stewart's El. i.* 393.—In crevices of rocks and sand, common.

Body reddish, the tips of the glands pale, the glands themselves are disposed in vertical and transverse rows, to which adhere fragments of rock and shells; the feelers are numerous, conical, or lengthened, and variously annulated or variegated with white and red.

43. *A. sulcata*.—Body longitudinally sulcated, the tentacula exceeding its length.

*Hydra tentaculis denudatis*, numerosissimis; corpore longitudinaliter sulcato, *Gaert. Phil. Trans.* 1761, 78. t. i. f. 1.—*A. sul.* *Penn. Brit. Zool. iv.* 48.—*A. maculata*, *Adams, Linn. Trans. v.* 8.—*A. cereus*, *Turt. Brit. Fauna*, 131.—*A. sul.* *Stewart's El. i.* 394.—Rocks of Cornwall.

Body smooth, of a chesnut colour, the margin of the oral disc dentated; the tentacula, which the animal cannot wholly withdraw, are greenish, with a red tip, nearly 200 in number, and greatly exceed the body in length.

44. *A. pedunculata*.—Body lengthened, the lower part narrow, smooth, the upper enlarged, and glandularly warty; oral disc expanded, lobed; tentacula in several rows, variegated.

*Hydra calyciflora*, tentaculis retractilibus variegatis, corpore verrucoso, *Gaert. Phil. Trans.* 1761, 79. t. i. f. 2.—*A. ped.* *Penn. Brit. Zool. iv.* 49.—*A. bellis*, *Turt. Brit. Fauna*, 131.—*A. plumosa*, *Stewart's El. i.* 394.—Southern coast of England.

Stalk cylindric, body suborbicular, of a brown colour, with fragments of shells adhering to the warts; tentacula unequal, those nearest the mouth longest, variegated; a spotted space round the mouth variegated. A gregarious species.

45. *A. dianthus*.—Body cylindrical, oral disc expanded, five lobed imbricated, with short tentacula.

*Ellis, Phil. Trans.* 1767, 436. t. xix. f. 8.—*A. pentapetala*, *Penn. Brit. Zool. iv.* 50.—*A. senilis*, *Adams, Lin. Trans. v.* 9.—*A. dianthus*, *Turt. Brit. Fauna*, 131. *Stewart, El. i.* 394.—Gregarious in pools near low-water mark.

Body soft, pale bluish-white, diaphanous, with whitish veins, and numerous pores; oral disc lobed at the pleasure of the animal, covered with short narrow flat tentacula; mouth deeply striated, four of the striae on one side more deeply seated, forming prominent ridges.

46. *A. intestinalis*.—Body cylindrical, the upper half suddenly contracted, and narrow:

*Fab. Fauna Groen.* 351. t. i. f. 11.—Adheres to rocks at low-water mark, Zetland.

When contracted, the body seems like two broad rings, of nearly equal breadth, and about half an inch in diameter; when expanded to nearly two

inches, the body consists of two cylindrical portions, of different dimensions, smooth, pellucid, yellowish; a few longitudinal white streaks under the skin; oral disc not expanded, surrounded with about 18 filiform tentacula in two alternate rows.

47. "*A. anemonoides*.—Nearly cylindrical, rather short, red; interior tentacula ramified, outer ones conic, obtuse.

" Rocky coasts, *Shaw*, Nat. Misc. t. xxvi. 27.

" Body with a triple concentric row of tentacula, of a yellow colour, varied with red; stomach pale yellow, with red and pale sea-green stripes."—*Turt. Brit. Fauna*, 131.

48. "*A. caryophyllus*.—Red-brown, with small pencil-formed tentacula.

" *Martin's Marine Worms*, i. 1. t. i. f. 1."—*Turt. Brit. Fauna*, 131.

GEN. XVII. MAMMARIA.—Body smooth, mouth terminal, without tentacula.

49. *M. mamilla*.—Conical, ventricose, and white.

*Mull. Prod. Zool. Dan.* 224. *Jameson*, Wern. Mem. i. 557.—On fuci, Leith shore, Professor Jameson; Belfast, Mr Templeton.

GEN. XVIII. LUCERNARIA.—Body narrow towards the adhering extremity, expanding into an oral disc which is divided into lobes bearing the tentacula.

50. *L. auricula*.—Peduncle of the body short, tufts of tentacula equidistant, with one intervening oval vesicle.

*Fab. Fauna Groen.* 341. *Mull. Zool. Dan.* t. clii. *Mont. Linn. Trans.* ix. 113. t. vii. f. 5. *Lamouroux*, Mem. No. iii.—Adheres to fuci, near low-water mark, on different parts of the coast.

Body brownish, the portion next the adhering extremity cylindrical, short, terminating in a bell-shaped, wide, concave, oral disc, divided into eight lobes, each terminating in a tuft of short clavate tentacula.

51. *L. fascicularis*.—Peduncle of the body produced; tuft of tentacula in pairs, about a hundred in each.

*Flem. Wern. Mem.* ii. 248. t. xviii. f. 1, 2. *Lamouroux*, Mem. No. i.—On the broad leaves of fuci, Zetland.

Colour dark brown; peduncle cylindrical, flexuous, wrinkled, with a narrow base; body bell-shaped, subquadrangular, concave; margin divided into four pairs of arms, concave within; mouth central, tubular, consisting of a loose membrane, four notched at the tip, and also expanded circular or striated at the pleasure of the animal, the inside with numerous white filaments.

**GEN. XIX. VELELLA.**—Body gelatinous, with an obliquely inserted prominent dorsal crest ; oral disc flat.

52. *V. limbosa*.—Body oval, blue ; oral disc with numerous short white filiform tentacula, those of the margin long, unequal, filiform.

Holothuria spirans, *Forskael*, Desc. On. 104.—*V. lim.* *Lamarck*, Hist. ii. 482.—Barnstaple, *Dr Leach*.

Body attenuating dorsally, bluish ; the crest is suborbicular, compressed, veined ; the oral tentacula are thickest in the middle. An imperfect example of a *Velella*, which Dr Leach considered as the *limbosa* of Lamarck, was obligingly communicated many years ago.

53. *V. pocillum*.—Body round, white, with a broad striated bluish border ; oral disc with unequal clavated blue tentacula ; the margin crenulated.

Medusa pocillum, *Mont. Linn. Trans.* xi. 201, t. xiv. f. 4.—Coast of Devon.

Body campanulate ; crest subovate, striated, compressed, and extremely thin ; there are about 10 large clavated tentacula, and many intermediate smaller ones.

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Dr Walker, in his *MS. adversaria* for 1771 states the *Medusa velella* of Linnaeus, as having been found at Ose in Sky ; and Mr Pennant in his " Caledonian Zoology," prefixed to Lightfoot's " Flora Scotica," vol. i. 66. notices the same animal without any remark. It is impossible to determine with certainty to which of the modern species these references belong.

**GEN. XX. EULIMENA.**—Body pouch-like, the mouth large, with a simple margin.

54. *E. quadrangularis*.—Lengthened, subquadrangular, the oral extremity truncated, the opposite end rounded.

*Flem. Edin. Phil. Journ.* viii. 302.—Pentland Frith.

Length about an inch, breadth half an inch ; transparent ; 8 minute ciliated ribs from the crown to the margin ; the oral disc smooth, having the mouth in the form of a transverse slit, leading into an apparently simple central cavity. When active, the ciliæ are in constant motion, and the body frequently assumes the form of a quadrangular prism.

**GEN. XXI. GERYONIA.**—Hemispherical, margin with tentacula, the mouth central.

55. *G. equorea*.—Orbicular, depressed, with a villous inflected margin, bearing tentacula.

Medusa eq. *Mull. Prod.* 233. *Jameson, Wern. Mem.* i. 558.—North of Scotland.

56. *G. hemisphœrica*.—With four transverse ribs, enlarged towards the circumference.

Medusa hemis. *Mull. Zool. Dan.* t. vii.—Medusa, *Cordiner's Ruins*, No. xi.—M. hem. *Macartney*, *Phil. Trans.* 1810, 268. t. xv. f. 5.

Minute, campanulate, the mouth subpedunculated, with five very short arms.—This species is one of those which are remarkably luminous at night, and is very common.

57. *G. octona*.—Body round subconical, blunt at the summit, and slightly acuminate.

*Flem. Edin. Phil. Journ.* viii. 299.—At the Bell Rock.

About an eighth of an inch in diameter; margin furnished with eight similar tentacula, equal to the diameter of the body; oral disc concave, with the central mouth slightly pedunculated.

GEN. XXII. CYANÆA.—Body hemispherical; mouth with arms; margin of the body with tentacula.

58. *C. aurita*.—Convex, translucent, with four incurved semicircular central markings; mouth with four long crenulated and ciliated arms.

Medusa aurita, *Linn. Syst.* 1197. *Mull. Zool. Dan.* t. lxxvi.—M. cruciata, *Turt. Brit. Fauna*, 139.—M. cruciata and aurita, *Stewart's El.* i. 399.—Not uncommon.

On the dorsal aspect the body is depressedly convex, smooth; the marginal tentacula are thick at the base, interrupted in the circle by eight globular organs, with two arms, having a perforated middle process with a black point; the arms do not appear in very young specimens.

59. *C. fusca*.—A brown circle in the centre of the dorsal disc, with 16 rays, of the same colour, converging from the circumference.

*Urtica marina*, *Borl. Corn.* 256. t. xxv. f. 7.—Medusa fusca, *Penn. Brit. Zool.* iv. 57.—Shores of Cornwall.

Convex, the circumference with 16 knobs, the termination of the rays with intermediate crooked fangs between each; mouth cruciform.

60. *C. purpurea*.—A pale purple cross in the centre, with 4 incurved semicircular marks, and 16 diverging deep purple rays.

*Borl. Corn.* 257. t. xxv. f. 9.—Medusa purpurea, *Penn. Brit. Zool.* iv. 57.—Common.

Margin more incurved than the preceding; rays of the cross pointed; mouth cruciform, with 4 arms.

61. *C. tuberculata*.—A granulated central spot, with 16 diverging simple rays.

*Borl. Corn.* 257. t. xxv. f. 11.—M. tuberculata, *Penn. Brit. Zool.* iv. 58.—Shores of Cornwall.

The margin has two tubercles between each ray. The arms are narrow, and longer than the body.

62. *C. capillata*.—Convex, the margin divided into 16 segments.

M. cap. *Bast.* Op. ii. 60. t. v. f. 1. *Turt. Brit. Fauna*, 139. *Stewart's El.* i. 399.—Not uncommon.

Colour brownish, with a central mark, from which 16 rays diverge; oral disc with numerous capillary filaments.

**GEN. XXIII. RHIZOSTOMA.**—Four cavities beneath, with a central peduncle divided into arms.

**63. R. undulata.**—Circumference waved, with fangs in the projecting parts.

*Borl. Corn.* 257, t. xxv. f. 15.—M. und. *Penn. Brit. Zool.* iv. 58.—Shores of Cornwall.

Margin thin; peduncle divided into eight arms, with a pair of lobes at the base of each.

**GEN. XXIV. CASSIOPEA.**—Eight cavities beneath, with eight arms.

**64. C. lunulata.**—Margin with numerous semicircular fangs tipped with blue.

*Borl. Corn.* 258, t. xxv. f. 16.—M. lun. *Penn. Brit. Zool.* iv. 58.—Shores of Cornwall.

On the oral disc there are eight semicircular openings, with eight arms having jagged edges, and sixteen jagged processes at the base.

The characters of the preceding species of the Linnean genus *Medusa*, require revision, and the species should be studied with reference to the changes in form which they experience by age. The *Medusa simplex* of Pennant and *M. scintillans* of Macartney, are probably the fry of some of the established species.

**GEN. XXV. BEROE.**—Body with vertical ciliated ribs; tubular vessels traverse the axis of the body, with lateral and terminal apertures.

**65. B. ovatus.**—The body orbicular, slightly depressed at the summit, and a little protuberant at the base.

*Bast. Op. i.* 123, t. xiv. f. 5.—B. infundibulum, *Fab. Fauna Groen.* 360.—*Beroe, Flem. Wern. Mem.* iii. 401, t. xviii. f. 3, 4.—Frith of Tay.

The following observations were made from an inspection of the only specimen of this animal which I have had an opportunity of seeing: “There were eight vertical bands or ribs, extending from the summit to the base. These were narrow, denticulated on the margin, confined to the surface, and of a denser substance than the gelatinous interior. From the central surface of the ribs, a number of filaments proceeded, which were lost in the substance of the body. The mouth, or the opening at the base, had some appearance of having its margin divided into four lobes. The tube which conducts from the mouth to the centre of the body, and is prolonged in its axis to the summit, had on each side a compressed organ adhering to its walls.

These terminated in the centre, each in an ovate head, apparently containing air. Immediately below each head, there were numerous twisted vessels, some of which contained a reddish fluid. The tube which descended from the summit, as it approached the centre, suddenly expanded, and sent off a branch to a vesicle on each side; after which it appeared to unite with the one from the mouth. Each of the lateral vesicles terminated below in a blind cavity, which contained a glandular body, to the upper surface of which, several white threads were attached. The upper extremity of each vesicle was open, and terminated on the surface, on each side, in the space between two ribs. From each side of the vesicle, near its connection with the central vessel, there arose a tube, which, after dividing, sent a branch to each contiguous rib. The cavity of these tubes, at their union with the ribs, appeared to be filled with a whitish coloured pulp. Each rib is furnished with a tube, uniting with it near the middle. In consequence of this peculiar structure, I could easily observe the water enter the tube at the summit, pass into the lateral vesicles, and go out at their external openings; and, in some cases, the motion of the current was reversed. There did not appear to be any external opening at the extremity of the tubes joining with the ribs, although water obviously moved backwards and forwards in them. While the animal was active, there were numerous small spaces in the different tubes where the contained fluid circulated in eddies. This was particularly observable towards the centre, and in the tube which descends from the summit. I was unable to detect, with the naked eye, any structure in the tubes which could produce these partial motions; and the orbicular form of the animal prevented the application of high magnifiers. The species here described approaches, in many respects, to the *Beroe ovata* of Baster, *Opuscula subseciva*, vol. i. p. 123. tab. xiv. f. 5. It differs, however, in having only eight ribs, apparently smooth on the surface, with denticulated margins; whereas the species which Baster notices has nine ribs, thickly set with moveable hairs. The season in which ours was found, would likewise intimate that it is distinct from Baster's species, provided we attach much importance to his remarks. "In nostris hæc *Beroe* invenitur littoribus, et in ipsis hujus urbis portibus, Aprili potissimum mense; singularis enim variarum Medusæ specierum proprietas est, quod aliæ aliis frequentissime inveniuntur mensibus." Ellis appears to have been acquainted with this species, when he says, "The *Beroe* is a marine animal found on our coasts; of a gelatinous transparent nature; and of an oval or spherical form; about half an inch to an inch diameter; divided, like a melon, into longitudinal ribs, each of which is furnished with rows of minute fins, by means of which this animal, like the *animalia infusoria*, can swim in all directions with great swiftness."—Phil. Trans. vol. lix. p. 144.

### 66. *B. cucumis*.—Body oblong, the oral aperture wide.

*Fab. Fauna Groen.* 361.—*B. fulgens*, *Macartney*, *Phil. Trans.* 1810, 264. t. xv. f. 1–8.—Shore of Kent.

"This most elegant creature" (says Mr Macartney) "is of a colour changing between purple, violet, and pale blue; the body is truncated before and pointed behind; but the form is difficult to assign, as it is varied by partial contractions, at the animal's pleasure. I have represented the two extremes of form that I have seen this creature assume. The first is somewhat that of a cucumber, which, as being the one it takes when at rest, should perhaps be considered as its proper shape. The other resembles a pear, and is the figure it has in the most contracted state. The body is hollow, or forms internally an infundibular cavity, which has a wide opening before, and appears also to have a small aperture posteriorly, through which it discharges its excrement. The posterior two-thirds of the body are ornamented with eight longitudinal ciliated ribs, the processes of which are kept in such a rapid rotatory motion, while the animal is swimming, that they appear like the continual passage of a fluid along the ribs. The ciliated ribs have been described

by Professor Mitchell as arteries, in a luminous *Beroe*, which I suspect was no other than the species I am now giving an account of. When the *Beroe fulgens* swam gently near the surface of the water, its whole body became occasionally illuminated in a slight degree; during its contraction, a stronger light issued from the ribs; and when a sudden shock was communicated to the water, in which several of these animals were placed, a vivid flash was thrown out. If the body were broken, the fragments continued luminous for some seconds, and, being rubbed on the hand, left a light like that of phosphorus. This, however, as well as every other mode of emitting light, ceased after the death of the animal." Mr Macartney observed this species in Hearne Bay, on the northern coast of Kent, in October 1804. None were to be found in the same place in the month of September in the following year, although some Medusæ occurred which had been the companions of the *Beroe* in the preceding season.

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There is a third animal, nearly related to the genus *Beroe*, which is figured by the late Rev. Charles Cordiner of Banff, in his "Remarkable Ruins," No. xi. Patella, fig. g G. The magnified representation which he has given, appears to intimate a subcylindrical animal, open at both ends, with a raised disc near one of the extremities, surrounded with diverging spines, and exhibiting two spots, whence probably issue tentacula. The author has failed in this, as in many other instances, to give descriptions in illustration of the designs of his pencil.

GEN. XXVI. PLEUROBRACHIA.—Body suborbicular, with eight ciliated ribs and two ciliated arms, one on each side.

67. *P. pileus*.—The lateral arms equal.

*Beroe*, *Bast. Op.* i. 124, t. xiv. f. 6.—*B. pileus*, *Fab. Fauna Groen.* 361.  
*Scoresby*, *Arctic Reg.* i. 549, t. xvi. f. 4.—In the British seas, rare.

The late George Montagu, Esq. in a letter to me, dated 22d November 1812, says, "I have lately added *Beroe pileus* to the British Fauna." My friend Dr Leach, who subsequently met with the same animal, sent me in 1819 an outline drawing of its form. I have since been informed by my friend John Graham Dalyell, Esq. advocate, that it occurs in the Frith of Forth.