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Arctic Zoology

In the 'Advertisement' to this 1784 two-volume work, Thomas Pennant (1726–98), zoologist and traveller, explains that his original intention was to record the zoology of North America 'when the empire of Great Britain was entire'. After the War of Independence, he changed his focus to the zoology (and people, archaeology and geology) of the Arctic regions of America, Europe and Siberia. The content of the volumes, one of the earliest works of systematic zoology published in Britain, is based on the writings of earlier zoologists, information obtained by Pennant from his scientific correspondents all over Europe and America, and his studies in private museums and collections. It is embellished with engravings of animals, birds, landscapes and artefacts. Volume 1 begins with an account of the various Arctic habitats, and describes the quadrupeds of these regions. Other works by Thomas Pennant are also reissued in the Cambridge Library Collection.

Cambridge University Press
978-1-108-07365-3 - Arctic Zoology: Volume 1: Class I. Quadrupeds
Thomas Pennant
Frontmatter
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Arctic Zoology

VOLUME 1:
CLASS I. QUADRUPEDS

THOMAS PENNANT



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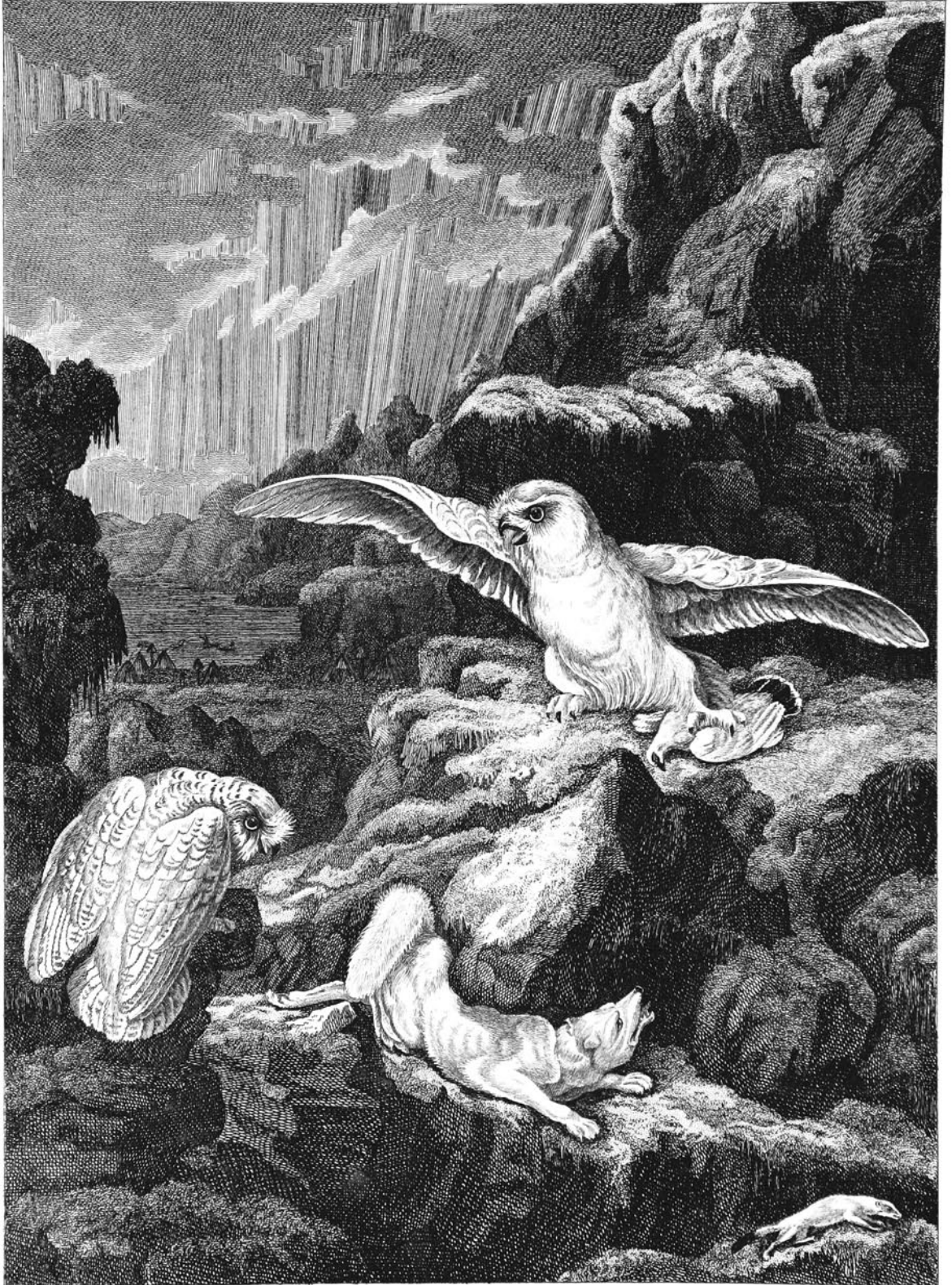
Thomas Pennant

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FRONTISPIECE

Vol. I



P. Paillone pinx.

P. Mazell sculp.

ARCTIC ZOOLOGY.

V O L. I.

I N T R O D U C T I O N.

C L A S S I. Q U A D R U P E D S.



L O N D O N :

P R I N T E D B Y H E N R Y H U G H S .

M. DCC. LXXXIV.

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A D V E R T I S E M E N T .

THIS Work was begun a great number of years past, when the empire of *Great Britain* was entire, and possessed the northern part of the New World with envied splendor. At that period I formed a design of collecting materials for a partial History of its Animals; and with true pains, by various correspondencies, made far greater progress in my plan than my most sanguine expectations had framed. Above a century ago, an illustrious predecessor in the line of Natural History, who as greatly exceeded me in abilities as he did in zeal, meditated a voyage to the New World, in pursuance of a similar design. The gentleman alluded to was FRANCIS WILLUGHBY, Esq; who died in 1672, on the point of putting his design in execution. Emulous of so illustrious an example, I took up the object of his pursuit; but my many relative duties forbade me from carrying it to the length conceived by that great and good man. What he would have performed, from an actual inspection in the native country of the several subjects under consideration, I must content myself to do, in a less perfect manner, from preserved specimens transmitted to me; and offer to the world their Natural History, taken from gentlemen or writers who have paid no small attention to their manners.

Let me repeat, that this Work was designed as a sketch of the Zoology of *North America*. I thought I had a right to
A the

A D V E R T I S E M E N T.

the attempt, at a time I had the honor of calling myself a fellow-subject with that respectable part of our former great empire; but when the fatal and humiliating hour arrived, which deprived *Britain* of power, strength, and glory, I felt the mortification which must strike every feeling individual at losing his little share in the boast of ruling over half of the New World. I could no longer support my clame of entitling myself its humble Zoologist: yet, unwilling to fling away all my labors, do now deliver them to the Public under the title of the ARCTIC ZOOLOGY. I added to them a description of the Quadrupeds and Birds of the north of *Europe* and of *Asia*, from latitude 60 to the farthest known parts of the *Arctic* World, together with those of *Kamtshatka*, and the parts of *America* visited in the last voyage of the illustrious Cook. These additional parts I have flung into the form of an Appendix to each genus, and distinguished by a *fleur de lis*; and the species by literal instead of numeral marks, which distinguish those of *North America*. These will, in a great measure, shew the dilatation of Quadrupeds and Birds, and the migrations of the feathered tribe, within part of the northern hemisphere.

I have, whenever I could get information, given their respective residences, as well as migrations to far more northern parts, to shew to what very remote places the Author of Nature hath impelled them to retire, to breed in security. This wise provision preserves the species entire, and enables them to return by myriads, to contribute to the food or luxuries of southern climates. Whatever is wanting in the *American* part, I may foresee, will in time be amply supplied. The powers of literature will soon arise, with the other strengths of the new empire, and some native Naturalist give perfection to that

A D V E R T I S E M E N T.

part of the undertaking, by observations formed on the spot, in the uses, manners, and migrations. Should, at present, no one be inclined to take the pen out of my hand, remarks from the other side of the *Atlantic*, from any gentlemen of congenial studies, will add peculiar pleasure to a favorite pursuit, and be gratefully received.

I must reckon among my most valued correspondents on the New Continent, DOCTOR ALEXANDER GARDEN *, who, by his long residence in *South Carolina*, was enabled to communicate to me variety of curious remarks and subjects, as will appear in the following pages.

To the rich museum of *American Birds*, preserved by Mrs. ANNA BLACKBURN, of *Orford*, near *Warrington*, I am indebted for the opportunity of describing almost every one known in the provinces of *Jersey*, *New York*, and *Connecticut*. They were sent over to that Lady by her brother, the late Mr. *Ashton Blackburn*; who added to the skill and zeal of a sportsman, the most pertinent remarks on the specimens he collected for his worthy and philosophical sister.

In the foremost rank of the philosophers of the Old Continent, from whose correspondence I have benefited, I must place DOCTOR PETER SIM. PALLAS, at present Professor of Natural History in the service of the illustrious EMPRESS of *Russia*: he not only favored me with the fullest remarks on the Zoological part of that vast empire, most of which he formed from actual travel and observation, but collected for my use various other remarks from the manuscripts of his predecessors; especially what related to *Kamtshatka* from those

Now resident in *London*.

A 2

of

A D V E R T I S E M E N T.

of STELLER ; which have assisted me in the history of parts hitherto but very slightly understood.

From the correspondency and labors of Mr. EBERH. AUG. WILLIAM ZIMMERMAN, Professor of Mathematics at *Brunswick*, I have collected most uncommon instruction. His *Specimen Zoologicæ Geographicæ Quadrupedum** is a work which gives a full view of the class of Quadrupeds, and the progress they have made in spreading over the face of the earth, according to climates and latitudes. Their limits are described, in general, with uncommon accuracy. Much is said of the climates themselves; of the varieties of mankind; of the effects of heat and cold on them and other animals. A most curious map is joined to the work, in which is given the name of every animal in its proper climate; so that a view of the whole Quadruped creation is placed before one's eyes, in a manner perfectly new and instructive †.

To the following foreigners, distinguished for their literary knowledge, I must pay my best acknowledgement for variety of most useful communications: DOCTOR ANDERS SPARMAN, of *Stockholm*; DOCTOR CHARLES P. THUNBERG, of *Upsal*; MR. AND. J. RETZIUS, Professor of Natural History at *Lund*; MR. MARTIN THRANE BRUNNICH, Professor of Natural History, and MR. OTHO MULLER, Author of the *Zoologia Danica*, both of *Copenhagen*: and let me add my great obligations to the labors of the Reverend Mr. OTTO FABRICIUS, for his most finished *Fauna of Greenland*.

A quarto in *Latin*, containing 68; pages, printed at *Leyden*, 1777; sold in *London* by Mr. Faden, Geographer, *St. Martin's Lane*.

† A new edition of the map has been lately published by the learned Author; the geographical part is corrected according to the late voyages of Captain Cook, and great additions made to the zoological part. An explanation is given, in the third volume of the *Zoologia Geographicæ*, lately published in *German* by the Author.

To

A D V E R T I S E M E N T.

To many of my countrymen my best thanks are due for literary assistances. Sir JOSEPH BANKS, Baronet, will, I hope, accept my thanks for the free admittance to those parts of his cabinet which more immediately related to the subject of the following sheets.

To Sir ASHTON LEVER, Knight, I am highly indebted, for the more intimate and closer examination of his treasures than was allowed to the common visitors of his most magnificent museum.

To Mr. SAMUEL HEARN, the great explorer by land of the *Icy Sea*, I cannot but send my most particular thanks, for his liberal communication of many zoological remarks, made by him on the bold and fatiguing adventure he undertook from *Hudson's Bay* to the *ne plus ultra* of the north on that side.

Mr. ANDREW GRAHAM, long a resident in *Hudson's Bay*, obliged me with numbers of observations on the country, and the use of multitudes of specimens of animals transmitted by him to the late museum of the Royal Society, at the instance of that liberal patron of science, my respected friend the Honorable DAINES BARRINGTON.

Let me close the list with acknowledging the great assistance I have found in the Synopsis of Birds by Mr. JOHN LATHAM; a work now brought almost to a conclusion, and which contains a far greater number of descriptions than any which has gone before. This is owing not only to the assiduity of the Author, but also to the peculiar spirit of the *English* nation, which has, in its voyages to the most remote and most opposite parts of the globe, paid attention to every branch of science. The advantages are pointed out by the able pen of the Reverend Doctor DOUGLAS, in his Introduction to the last Voyage of our

A D V E R T I S E M E N T.

our great navigator, published (under the auspices of the Lords of the Admiralty) in a manner which reflects honor on our country in general, and will prove a most lasting monument to the memory of the great Officer who so unfortunately perished by savage hands, and his two able consorts, who at length sunk beneath the pressure of fatigue, in carrying the glory of discovery far beyond the attempts of every preceding adventurer.

DOWNING,
February 1, 1785.

THOMAS PENNANT.

PLATES.

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V O L. I.

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IV. Burgh of *Snaburgh* in *Unst*, one of the *Schetlands*.

V. Burgh of *Hogfeter*.

VI. Roman camp in *Felther*.

For the drawings from which these Antiquities were engraven, I am indebted to the Reverend Mr. *Low*, Minister of *Birfa* in *Orkney*, who, at my request, made the voyage of the *Orkney* and *Schetland* isles in 1778. He hath prepared his journal for the press: it is to be hoped, that the liberality of the public will enable him to give this addition to my labors, which will complete the account of the northern part of the *British* dominions.

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I N T R O D U C T I O N .

O F T H E

A R C T I C W O R L D .

A KNOWLEDGE of the geography, climate, and soil, and a general view of the productions of the countries, whose Zoologic History is to be treated of, are points so necessary, that no apology need be made for introducing them into a prefatory discourse.

It is worthy human curiosity to trace the gradual increase of the animal world, from the scanty pittance given to the rocks of *Spitzbergen*, to the swarms of beings which enliven the vegetating plains of *Senegal*: to point out the causes of the local niggardness of certain places, and the prodigious plenty in others. The Botanist should attend the fancied voyage I am about to take, to explain the scanty herbage of the *Arctic* regions; or, should I at any time hereafter descend into the lower latitudes, to investigate the luxuriancy of plants in the warmer climates.

The Fossilist should join company, and point the variations of primæval creation, from the solid rock of *Spitzbergen* through all the degrees of terrestrial matter: the steps it makes to perfection, from the vilest earth to the precious diamond of *Golconda*. The changes in the face of the globe should be attended to; the destructions by volcanoes; the ravages of the sea on some coasts, and the recompence it may have made to others, by the retreat of its waters.

The pursuit of these enquiries will also have a farther and more important object. History should be called in, and a brief account given of the population of the more remote countries—the motives which induced mankind to seek retreats in climates seemingly destitute of incitements to migration. Particular attention should be paid to the means of peopling the new world, and of stocking it with animals, to contribute to the support of mankind, after the first colonization—the increase of those animals, and their cessation, and giving place in a certain latitude to genera entirely different.

a

Here

Here the fine study of Geography should step in to our assistance. The outline of the terrestrial globe should be traced; the several approximations between part and part should be attended to; the nature of the oceans observed; the various islands pointed out, as the steps, the baiting-places where mankind might have rested in its passage from an overcharged continent.

The manners of the people ought not less to be attended to; and their changes, both mental and corporeal, by comparison of the present state of remote people with nations with whom they had common ancestors, and who may have been discovered still to retain their primæval seats. Some leading customs may still have been preserved in both; or some monuments of antiquity, proofs of congenial habitudes, possibly no longer extant in the savage than in the cultivated branches of the common stock.

STREIGHTS OF
DOVER.

Let me take my departure northward, from the narrow streights of *Dover*, the site of the isthmus of the once peninsulated *Britain*. No certain cause can be given for the mighty convulsion which tore us from the continent: whether it was rent by an earthquake, or whether it was worn through by the continual dashing of the waters, no *Pythagoras* is left to solve the *Fortuna locorum*:

Vidi ego, quod fuerat quondam solidissima tellus
 Esse fretum

CHALKY STRATA.

But it is most probable, that the great philosopher alluded to the partial destruction of the *Atlantica insula*, mentioned by *Plato* as a distant tradition in his days* It was effected by an earthquake and a deluge, which might have rent asunder the narrow isthmus in question, and left *Britain*, large as it seems at present, the mere wreck of its original size †. The *Scilly* isles, the *Hebrides*, *Orknies*, *Schetlands*, and perhaps the *Feroe* islands, may possibly be no more than fragments of the once far-extended region. I have no quarrel about the word *island*. The little isthmus, compared to the whole, might have been a junction never attended to in the limited navigations of very early times. The peninsula had never been wholly explored, and it passed with the antients for a genuine island. The correspondency of strata on part of the opposite shores of *Britain* and *France*, leaves no room to doubt but that they were once united. The chalky cliffs of *Blanc-nez*, between *Calais* and *Bologne*, and those to the westward of *Dover*, exactly tally: the last are vast and continued; the former short, and the termination of the immense bed. Between *Bologne* and *Folkstone* (about six miles from

* *Plato* died about the year 347 before CHRIST, aged 81. *Pythagoras*, about 497, aged 90.

† See this opinion farther discussed by Mr. *Somner*, *Pb. Trans. Abridg.* iv. 230.

E N G L A N D.

III

the latter) is another memorial of the junction of the two-countries; a narrow submarine hill, called the *Rip-raps*, about a quarter of a mile broad, and ten miles long, extending eastwards towards the *Goodwin Sands*. Its materials are boulder-stones, adventitious to many strata. The depth of water on it, in very low spring-tides, is only fourteen feet. The fishermen from *Folkstone* have often touched it with a fifteen feet oar; so that it is justly the dread of navigators. Many a tall ship has perished on it, and sunk instantly into twenty-one fathoms water. In *July 1782*, the *Belleisle* of sixty-four guns struck, and lay on it during three hours; but, by starting her beer and water, got clear off.

RIP-RAPS.

These celebrated freights are only twenty-one miles wide in the narrowest part. From the pier at *Dover* to that at *Calais* is twenty-four. It is conjectured, that their breadth lessens, and that they are two miles narrower than they were in ancient times. An accurate observer of fifty years, remarks to me, that the increased height of water, from a decrease of breadth, has been apparent even in that space. The depth of the channel, at a medium, in highest spring-tides, is about twenty-five fathoms. The bottom, either coarse sand or rugged scars, which have for ages unknown resisted the attrition of the currents. From the freights, both eastward and westward, is a gradual increase of depth thorough the channel to a hundred fathoms, till soundings are totally lost or unattended to.

WIDTH OF THE
STREIGHTS.

DEPTH.

The spring-tides in the freights rise, on an average, twenty-four feet; the neap-tides fifteen. The tide flows from the *German sea*, passes the freights, and meets, with a great rippling, the western tide from the ocean, between *Fairleigh*, near *Hastings*, and *Bologne* *; a proof, that if the separation of the land was effected by the seas, it must have been by the overpowering weight of those of the north.

It is most certain, that *Britain* was peopled from *Gaul*. Similar customs, as far as can be collected, evince this fact. The period is beyond the reach of history.

BRITAIN, WHENCE
PEOPLED.

* All the intelligence respecting the tides, &c. in these parts, I received from Mr. *James Hammond* of the custom-house, *Dover*, and Mr. *William Cowly*, a veteran pilot of the same place.

Beyond the measure vast of thought,
 The works, the wizard TIME hath wrought!
 The *Gaul*, it's held of antique story,
 Saw *Britain* link'd to his now adverse strand;
 No sea between, nor cliff sublime and hoary,
 He pass'd with unwet feet through all our land.
 To the blown *Baltic* then, they say,
 The wild waves found another way. &c.

COLLINS'S *Ode to Liberty*.

If, after the event by which our island was torn from the continent, the migration over so narrow a strait might, in the earlier ages, have been very readily effected in the *vitilia navigia* or coracles, or the *monoxyla* or canoes in use in the remote periods; but the numerous species of Quadrupeds never could have swam into our island, even over such a contracted water, which at all times must have been possessed by tides so rapid, as to baffle their utmost efforts: their passage, therefore, must have been over the antient isthmus; for it is contrary to common sense to suppose, that our ancestors would have been at the trouble of transporting such guests as wolves and bears, and the numerous train of lesser rapacious animals, even had it been practicable for them to have introduced the domestic and useful species.

Would they on board or Bears or Lynxes take,
 Feed the She-adder, and the brooding Snake?

PRIOR.

QUADRUPEDS. Men and beasts found their way into *Great Britain* from the same quarter. We have no Quadrupeds but what are also found in *France*; and among our lost animals may be reckoned the *Urus*, p. 2; *Wolf*, N° 9; *Bear*, N° 20; *Wild Boar*; and the *Beaver*, N° 40: all which were once common to both countries. The *Urus* continued among us in a state of nature as late at least as the year 1466*: and I have seen some of their descendants, scarcely to be called tame, in confinement in the parks of *Drumlanrig* and *Chillingham*†. The *Caledonian Bears* were exported to *Rome*, and esteemed for their fierceness‡. They continued in *Scotland* till the year 1057. They existed in *Wales*, perhaps, till the same period; for our antient laws ranked them among the beasts of chase§. Wolves infested even the middle counties of *England* as late as the year 1281, and continued their ravages in *North Britain* in the reign of *Queen Elizabeth*; nor were they wholly extirpated till the year 1680. The *Wild*

* Six Wild Bulls were used at the installation feast of *George Nevil*, archbishop of *York*. *Leland's Collect.* vi, 2. † *Tours in Scotland*. ‡ *Martial*, *Plutarch*. § *Raj's Syn. Quad.* 214.

E N G L A N D.

v

Boars were common in the neighborhood of *London* in the reign of *Henry II.* and continued in our kingdom, in a wild state, till 1577: they were then only to be found in the woods of Lord *Latimer*, who, we are informed by Doctor *Moufet*, took great delight in their chase *. Let me add, from the same authority, that Roebucks were found at the same period in *Wales*, and among the *Cheviot hills*; they are now confined to the Highlands of *Scotland*. Finally, Beavers inhabited *Wales* in 1188, when our historian, *Giraldus*, made his progress through the principality. Every one of these animals are at this time to be found in *France*, the *Urus* excepted. *Theodebert*, king of *France*, perished in the chase of one about the year 548 †; but it is probable that the species must have existed in that vast kingdom long after that event.

The Elk, N° 3; Genet, *Hist. Quad.* N° 224; Lynx, N° 150; Fat Dormouse, *Hist. Quad.* N° 287; Garden Dormouse, *Hist. Quad.* N° 288; and the Bats *Serotine*, *Pipistrelle*, and *Barbastelle*, *Hist. Quad.* N^{rs} 408, 409, 410, either never reached our island, or if they did, perished so early, that even their very names in the *British* tongue, have perished with them. The *Ibex*, *Hist. Quad.* N° 13, and the *Chamois*, *Hist. Quad.* N° 17, inhabitants only of the remote *Gaulish Alps* and *Pyreneans*, probably never reached us. *France*, therefore, possesses forty-nine species of Quadrupeds; we only thirty-nine. I exclude two species of Seals ‡ in both reckonings; being animals which had at all times powers of making themselves inhabitants of the coasts of each kingdom.

Birds, which have the ready means of wafting themselves from place to place, have notwithstanding, in numbers of instances, their limits. Climate confines some within certain bounds, and particular sorts of food induce others to remain within countries not very remote from us; yet, by wonderful instinct, birds will follow cultivation, and make themselves denizens of new regions. The *Cross-bill* has followed the apple into *England*. *Glenco*, in the *Highlands* of *Scotland*, never knew the Partridge, till its farmers of late years introduced corn into their lands: nor did Sparrows ever appear in *Siberia*, till after the *Russians* had made arable the vast wastes of those parts of their dominions. Finally, the Rice Buntings, p. 360, natives of *Cuba*, after the planting of rice in the *Carolinas*, annually quit the island in myriads, and fly over sea and land, to partake of a harvest introduced there from the distant *India*.

BIRDS.

* *Health's Improvement.* † *Ecole de la Chasse*, clxi.

‡ The Common Seal, is common to the ocean and *Mediterranean* sea. Possibly the *Mediterranean* Seal, *Hist. Quad.* N° 376, may be so likewise.—This work is always intended, when the name of the work referred to is not added to the numbers,

FRANCE,

FRANCE, as it exceeds in variation of climate, so it exceeds us in the number of species of birds. We can boast of only one hundred and thirty-one kinds of land-birds, and one hundred and twenty-one of water-fowl. *France*, on the contrary, has one hundred and fifty-six of the first, and one hundred and thirteen of the last. This computation may not be quite accurate; for no one has as yet attempted its *Fauna*, which must be very numerous, in a kingdom which extends from *Calais*, in about lat. 51, to *Collioure* in the south of *Rouffillon*, on the *Mediterranean* sea, in about lat. 42. The northern parts possess the birds in common with *England*: and in all probability the provinces in the *Mediterranean* annually are visited by various species from northern *Africa*.

COASTS OF BRITAIN.

Stupendous and precipitous ranges of chalky cliffs attend the coast, from *Dover* eastward, and, from their color, gave the name of *Albion* to our island. Beneath one of them anchored *Cesar*, fifty-five years before CHRIST, and so near as to be capable of being annoyed by the darts of the *Britons*. After weighing anchor, he sailed up a bay, now occupied by meadows, and landed at *Rutupium*, *Richborough*, opposite to the present *Sandwich*. The walls of the former still evince its antient strength; and the vestiges of a quay, now bounded by a ditch, points out the anchorage of the *Roman* commerce. The adjacent *Thanet*, the *Thanatos* of the antients, at present indistinguishable from the main land, was in old times an island, separated by a deep channel, from a mile and a half to four miles in width, the site of *Roman* settlements; and, in 449, celebrated for having been the first landing-place of the invading *Saxons*; to whom it was assigned as a place of security by the imprudent *Vortigern*. But such a change has time effected, that *Thanet* no more exists as an island; and the *Britanniarum Portus*, in which rode the *Roman* navies, is now filled with marshy meads.

After passing the lofty chalky promontory, the *North Foreland*, opens the estuary of the *Thames*, bounded on each side by low shores, and its channels divided by numerous sand-banks; securely passed, by reason of the perfection of navigation, by thousands of ships frequenting annually *London*, our emporium, envied nearly to impending decline.

SUFFOLK AND NORFOLK.

On the projecting coasts of *Suffolk* and *Norfolk*, arise, in certain intervals, eminences of different matter. *Loamy* cliffs appear about *Leosloffs*, *Dunwich*, &c. The *Crag-pits* about *Woodbridge*, are prodigious pits of sea-shells, many of them perfect and quite solid; an inexhaustible fund of manure for arable lands. About *Yarmouth*, and from thence beyond *Wintertonefs*, the coast is low, flat, and composed of shingle, backed by sand. From *Hapsburgh* to *Cromer* are a range of lofty clayey precipices, rising from the height of forty to a hundred feet perpendicular; a prey to the ocean, which has effected great changes in these parts. About *Sherringham* and *Cley*, it rises into pretty and gentle hills, sloping down into a rough

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rough shore, of little rocks and stones. At *Holkham*, *Wells*, and *Wareham*, the sandy shores terminate in little hillocks of sand, kept together by the *Arundo Arenaria*, or *Bent*, the great preservative against the inundations of sand, which would otherwise destroy whole tracts of country, and in particular soon render useless the range of salt-marshes which these are backed with. *Hunstanton* cliff rises a distinguished feature in this flat tract. The surface is the usual vegetable mould, about a foot deep; beneath that are two feet of small broken pieces of chalk: the solid stratum of the same, after having been lost for numbers of miles, here again makes its appearance, and forms a solid bed thirty feet in thickness, resting on a hard red stone four feet deep, which is often ground and made into a red paint. Seven feet of loose friable dirty yellow stone succeeds, placed on a base of iron-colored plumb-pudding-stone, projecting into the sea, with vast fragments scattered over the beach. This cliff is about eighty feet high, lies on the entrance of the washes, the *Metaris Estuarium* of *Ptolemy*. From hence, all the coast by *Snettisham* to *Lynn* is low, flat, and shingly.

From *Holm*, the northern promontory of *Norfolk*, the sea advances deeply westward, and forms the great bay called the *Washes*, filled with vast sand-banks, the summits of which are dry at low water; but the intervening channels are the means of prodigious commerce to *Lynn* in *Norfolk*, seated on the *Ouze*, which is circulated into the very inland parts of our island, through the various rivers which fall into its long course. *Lynn* is mentioned in the *Doomsday Book*; but became considerable for its commerce with *Norway* as early as the year 1284.

The opposite shore is that of *Lincolnshire*. Its great commercial town, *Boston*, stands on the *Witham*, a few miles from the head of the bay. Spring-tides rise at the quay fourteen feet, and convey there vessels of above a hundred tons; but greater ships lie at the *Scap*, the opening of the estuary. Such is the case at *Lynn*; for the sluggish rivers of these tame tracts want force to form a depth of water.

Lincolnshire, and part of six other counties, are the *Pais-bas*, the *Low Countries* of *Britain*; the former bounded on the western part by a range of elevated land, which, in this humble county, overlooks, as *Alps* would the ocean, the remaining part. This very extensive tract, from the *Scap* to the northern headland opposite to *Hull*, presents to the sea a bow-like and almost unindented front; and so low as to be visible from sea only at a small distance; and churches, instead of hills, are the only landmarks to seamen. The whole coast is fronted with salt-marshes or sand-hills, and secured by artificial banks against the fury of the sea. Old *Holinhead* gives a long list of ports on this now inhospitable coast. *Waynfleet*, once a noted haven, is at present a mere creek. *Skegness*, once a large walled town, with a good harbour, is now an inconsiderable place a mile from the sea: and the port of *Grimsby*,

LINCOLNSHIRE.

Grimesby, which in the time of *Edward III.* furnished him with eleven ships, is now totally choaked with sand.

The *Great Level*, which comprehends *Holland* in this county, with part of *Northamptonshire*, *Norfolk*, *Suffolk*, *Cambridge*, and *Huntingdon*, a tract of sixty computed miles in length, and forty in breadth, had been originally a wooded country. Whole forests of firs and oaks have been found in digging, far beneath the moor, on the solid ground; oaks fifteen feet in girth, and sixteen yards long, mostly burnt at the bottoms, the antient method of falling them: multitudes of others entirely rooted up, as appears, by the force of the sea bursting in and overwhelming this whole tract, and covering it with *silt*, or the mud which it carried with it from time to time. *Ovid's* beautiful account of the deluge was here verified; for under *Conington Down*, in *Huntingdonshire*, was found the skeleton of a whale near twenty feet long, which had once swam secure to this distance from its native residence.

Et modo quæ graciles gramen carpere capellæ,
 Nunc ibi deformes ponunt sua corpora phocæ.
 ————— sylvaque tenent delphines, et altis
 Incurfant ramis, agitataque robora pulsant.

In process of time this tract underwent another revolution. The *silt* or mud gained so considerably as to leave vast spaces dry, and other parts so shallow as to encourage the *Romans* to regain these fertilized countries from the sea. Those sensible and indefatigable people first taught us the art of embanking, and recovered the valuable lands we now possess. It was the complaint of *Galgacus*, that they exhausted the strength of the *Britons*, in *sylvis et paludibus emuniendis* *, 'in clearing woods and draining marshes.' After the *Romans* deserted our island, another change took place. Neglect of their labors succeeded: the drains were neglected, and the whole became fen and shallow lake, resembling the present east fen: the haunt of myriads of water-fowl, or the retreat of banditti. *Ely* and many little tracts which had the advantage of elevation, were at that period literally islands. Several of these in early times became the retreat of religious. *Ely*, *Thorney*, *Ramsfey*, *Spiney*, and others, rose into celebrated abbies, and by the industry of their inhabitants first began to restore the works of the *Romans*. The country above *Thorney* is represented by an old historian † as a paradise. Constant visitations, founded on wholesome laws, preserved this vast recovered country: but on the rapid and rapacious dissolution, the removal of numbers of the inhabitants, and the neglect of the laws of the *Sewers*, the drains were filled, the cultivated land overflowed, and

* *Vita Agricola.*

† *Malmshury*, lib. iv. 294.

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the country again reduced to a useless morass*. In the twentieth of *Elizabeth* the state of the country was taken into consideration †; no great matters were done till the time of *Francis*, and *William* his son, earls of *Bedford*, who attempted this *Herculean* work, and reclaimed this vast tract of more than three hundred thousand acres; and the last received, under sanction of parliament, the just reward of ninety thousand acres. I speak not of the reliques of the antient banks which I have seen in *Holland*, *Lincolnshire*, now remote from the sea, nor yet of the *Roman* tumuli, the coins, and other evidences of the residence of that nation in these parts; they would swell a mere preface to too great a length: and, it is to be hoped, will be undertaken by the pen of some native, who will perform it from his actual survey.

The vast fenny tracts of these counties were in old times the haunts of multitudes of water-fowl; but the happy change, by attention to draining, has substituted in their place thousands of sheep; or, instead of reeds, made those tracts laugh with corn. The Crane, which once abounded in these parts, has even deserted our island. The Common Wild Duck still breeds in multitudes in the unreclaimed parts; and thousands are sent annually to the *London* markets, from the numerous decoys. The Grey Lag Goose, *Br. Zool.* ii. N^o 266, the origin of the Tame, breeds here, and is resident the whole year: a few others of the Duck kind breed here. Ruffs, Redshanks, Lapwings, Red-breasted Godwits, and Whimbrels, are found here during summer; but, with their young, in autumn, disperse about the island. The Short-eared Owl migrates here with the Woodcock, and is a welcome guest to the farmer, by clearing the fields of mice. Knots swarm on the coasts in winter: are taken in numbers in nets: yet none are seen during summer ‡. The most distant north is probably the retreat of the multitude of water-fowl of each order which stock our shores, driven southward by the extreme cold: most of them regularly, others, whose nature enables them to brave the usual winters of the frigid zone, are with us only accidental guests, and in seasons when the frost rages in their native land with unusual severity.

From *Clea Nefs*, the land retires westward, and, with the opposite shore of *Yorkshire*, bounds the great estuary of the *Humber*, which, winding deep into the country, is the receptacle of the *Trent*, and all the considerable rivers of that vast province; some of which arise in its most remote parts. All these coasts of *Lincolnshire* are flat, and have been gained from the sea. *Barton* and *Barrow* have not at present the least appearance of ports; yet by *Holinshed* were styled good ones §. Similar

* Compare Sir *W. Dugdale's* maps of this tract, in its morassy and drained state. *Hist. Embank.* p. 375. 416. † Same, p. 375.

‡ See *Tour in Scotland*, 1769; *Lincolnshire*, where the fen birds are enumerated.

§ *Descr. Britain*, 108.

accidents have befallen the upper part of the low tract of *Holderness*, which faces the congruent shores. *Hedon*, a few miles below *Hull*, several hundred years ago a port of great commerce, is now a mile and a half from the water, and has long given way to the rising fortune of the latter (a creation of *Edward I.* in 1296) on account of the excellency of its port. But in return, the sea has made most ample reprisals on the lands of this hundred: the site, and even the very names of several places, once towns of note upon the *Humber*, are now only recorded in history: and *Ravensthorpe* was at one time a rival to *Hull**; and a port so very considerable in 1332, that *Edward Baliol* and the confederated *English* barons failed from hence with a great fleet to invade *Scotland*; and *Henry IV.* in 1399, made choice of this port to land at, to effect the depofal of *Richard II.* yet the whole of it has long since been devoured by the merciless ocean: extensive sands, dry at low water, are to be seen in their stead; except *Sunk Island*, which, till about the year 1666, appeared among them like an elevated shoal, at which period it was regained, by embankments, from the sea; and now forms a considerable estate, probably restored to its pristine condition.

SPURN HEAD.

Spurn Head, the *Ocelum Promontorium* of *Ptolemy*, terminates this side of the *Humber*, at present in form of a fickle, near which the wind-bound ships anchor securely. The place on which the lighthouses stand is a vast beach near two miles long, mixed with sand-hills flung up by the sea within the last seventy years.

The land from hence for some miles is composed of very lofty cliffs of brown clay, perpetually preyed on by the fury of the *German* sea, which devours whole acres at a time, and exposes on the shores considerable quantities of beautiful amber. Fine wheat grows on the clay, even to the edge of the cliffs. A country of the same fertility reaches from *Kilnsey*, near this place, as far as the village of *Sprottly*, extending, in a waved form, for numbers of miles; and, when I saw it, richly clothed with wheat and beans.

From near *Kilnsey* the land bends very gently inward, as far as the great promontory of *Flamborough*; and is a continuance of high clayey cliff, till about the village of *Hornsey*. Near it is a mere, noted for its Eels and Pikes, at present separated from the sea by so small a space as to render its speedy destruction very probable. A street, called *Hornsey Beck*, has long since been swallowed: and of *Hide*, a neighboring town, only the tradition is left.

BRIDLINGTON BAY.

The country grows considerably lower; and, near the base of the promontory, retires so far in as to form *Bridlington* bay, antiently called *Gabrantovicorum Sinus*, to which the Geographer adds $\text{Ευλιμεν}\text{\textcircled{C}}$, on account of the excellency and

* *Madox. Ant. Exch.* i. 422.

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safety of its port, where vessels ride in full security under the shelter of the lofty head-land. *Smithie* sand, the only one between *Flamborough* and *Spurn Head*, stretches across the entrance into *Bridlington* bay, and, in hard gales from the north and north-east, adds to the security of that noble asylum for the coasting vessels. *Sureby*, an adjacent village, seems no more than a translation from the old appellation. The *Romans*, in all probability, had a naval station here; for here ends the road, visible in many places between this place and *York*, and named, from its founders, the *Roman ridge*.

The head is formed of lime-stone, of a snowy whiteness*, of a stupendous height, and vast magnificence, visible far at sea. If we may depend on *Richard of Cirencester*, the *Romans* named it *Brigantum Extrema*, and the bay *Portus Felix*. The *Saxons* styled the cape *Fleamburg*, perhaps from the lights which directed the great *Ida*, founder of the *Northumberland* kingdom, to land here, in 547, with a great body of their countrymen.

FLAMBOROUGH
HEAD.

The vast height of the precipices, and the amazing grandeur of the caverns which open on the north side, giving wide and solemn admission, through most exalted arches, into the body of the mountain; together with the gradual decline of light, the deep silence of the place unless interrupted by the striking of the oar, the collision of a swelling wave against the sides, or the loud flutter of the pigeons affrighted from their nests in the distant roof; afford pleasures of scenery which such formations as this alone can yield. These also are wonderfully diversified. In some parts the caverns penetrate far, and end in darkness; in others are pervious, and give a romantic passage by another opening equally superb. Many of the rocks are insulated, of a pyramidal form, and soar to a great height. The bases of most are solid; but in some pierced through and arched. All are covered with the dung of the innumerable flocks of migratory birds which resort here annually to breed, and fill every little projection, every hole, which will give them leave to rest. Multitudes were swimming about; others swarmed in the air, and stunned us with

* Soft near the top, and of a crumbling quality when exposed long to the frost. At the foot of the cliff it is hard, solid, and smooth. Boats are employed every summer in carrying great quantities to *Sunderland*, where it is burnt into excellent lime. Most of the lime-stone used at *Scarborough* is made from stones flung up by the sea. It may be remarked, that whatsoever degree of hardness any lime-stone possesses in the quarry, the mortar made from it, by proper management, may be made as hard, but by no means harder. Most of the houses in and about *London* are built with lime made of chalk; hence the many miserable casualties there, by the fall of houses. The workmen, sensible of the weakness of that kind of mortar, endeavour to keep the walls together by lodging frames of timber in them; which being consumed in cases of fire, the whole building tumbles suddenly, and renders all attempts to extinguish the fire very dangerous.—*Mr. Travis*.

the variety of their croaks and screams. Kittiwakes and Herring Gulls, Guillemots and Black Guillemots, Auks, Puffins, Shags, and Corvorants, are among the species which resort hither. The notes of all sea-fowl are most harsh and inharmonious. I have often rested under rocks like these, attentive to the various sounds over my head; which, mixed with the deep roar of the waves slowly swelling, and retiring from the vast caverns beneath, have produced a fine effect. The sharp voice of the Gulls, the frequent chatter of the Guillemots, the loud notes of the Auks, the scream of the Herons, together with the deep periodical croak of the Corvorants, which serves as a basis to the rest, have often furnished me with a concert, which, joined to the wild scenery surrounding me, afforded in an high degree that species of pleasure which results from the novelty and the gloomy majesty of the entertainment.

ROCKY COASTS
 BEGIN.

At *Flamborough* head commence the hard or rocky coasts of this side of *Great Britain*, which continue, with the interruption of a few sandy bays and low land, to the extremity of the kingdom. It often happens, that the bottom of the sea partakes of the nature of the neighboring element: thus, about the head, and a few miles to the northward (in places) the shores are rocky, and the haunts of lobsters and other crustaceous animals. From these strata a tract of fine sand, from one to five miles in breadth, extends sloping eastward, and from its edge to that of the *Dogger-bank* is a deep bottom, rugged, rocky, and cavernous, and in most parts overgrown with corallines and submarine plants.

This disposition of shore gives to the inhabitants of this coast the advantageous fishery which they possess; for the shore on one hand, and the edges of the *Dogger-bank* on the other, like the sides of a decoy, give a direction to the immense shoals of the Cod genus, which annually migrate from the northern ocean, to visit, reside, and spawn, in the parts adjacent to our coasts. They find plenty of food from the plants of the rocks, and the worms of the sand, and secure shelter for their spawn in the cavernous part of the scarry bottom. It is in the channel between the banks and the shores, in which the Cod are taken, or in the hollows between the *Doggers* and *Well-bank*; for they do not like the agitation of the water on the shallows. On the contrary, the Skates, the Holibuts, Flounders, and other flat fish, bury themselves in the sand, and secure themselves from the turbulence of the waves.

An amazing shoal of Haddocks visit this coast periodically, generally about the tenth of *December*, and extend from the shore near three miles in breadth, and in length from *Flamborough* head to *Tinmouth* castle, perhaps further north. An army of a small species of Shark, the PICKED, *Br. Zool.* iii. N^o 40, flanks the outside of this shoal to prey upon it; for when the fishermen cast their lines
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beyond the distance of three miles from land, they never catch any but those voracious fish*.

Between *Flamborough* head and *Scarborough* projects *Filey Brig*, a ledge of rocks running far into the sea, the cause of frequent shipwrecks. *Scarborough* castle, seated on a vast rock projecting into the water, succeeds. The spring-tides, at the time of the equinoxes, rise here twenty-four feet; but at other times only twenty: the neap-tides from twelve to sixteen. Then *Whitby*, noted for its neighboring allum-works, and more for its fine harbour, the only one on the whole coast: the admittance into which is a narrow channel between two high hills: it expands largely within, and is kept clean by the river *Esk*. From hence to the mouth of the *Tees*, the boundary between this county and that of *Durham*, is a high and rude coast, indented with many bays, and varied with little fishing villages, built strangely among the cliffs, filling every projecting ledge, in the same manner with those of the peasants in the picturesque and rocky parts of *China*.

FILEY BRIG.

The *Tees*, the northern limit of this great county, opens with a wide mouth and mudded bottom into the sea. This was the *Dunum Estuarium* of *Ptolemy*; and serves as a brief entrance for navigators into the country. Almost all the northern rivers descend with a rapid course, from their mountainous rise and supply; and afford but a short navigation. From hence the lead of the mineral parts of *Durham*, and the corn of its more level parts, are imported. In the mud of this estuary, more particularly, abounds the *Myxine Glutinosa* of *Linnaeus*, the *Hag* of the neighboring fishermen; a worm, which enters the mouths of the fish taken on hooks, that remain a tide under water, and devours the whole, leaving only the skin and bones. This also is the worm which converts water into a sort of glue.

TEES.

From *Seaton Snook*, in the bishoprick of *Durham*, to *Hartlepool*, is a series of sand-banks, and the shore a long-continued sandy shallow. From the *Ness Point* of *Hartlepool* to *Blackhalls* is a rocky lime-stone coast, with frequent intervals of sand-bank, and a stony beach; but *Seham* and *Hartlepool* is so very rugged, that no enemy could land, or even stand off the shore, without the most imminent danger: in particular, the coasts about *Hawthorn Hive* are bold, excavated, and formed into grotesque figures, for several miles, and the shores rough with a broken and heavy sea, by reason of the hidden rocks and spits of sands which run out far.

DURHAM.

* Consult vol. iii. of the *Br. Zoology* for an account of the fish on this coast: also the *Tour in Scotland*, 1769. To Mr. *Travis*, Surgeon in *Scarborough*, I am indebted for the most curious articles.

FROM

NORTHUMBER-
LAND.

from land. From *Seham* to *Sunderland* are sand-hills and shallow sandy beaches. From *Weremouth* to near *Cleadon*, low rocks of lime-stone form the coast, here and there intersected with sand-hills and stony beaches. From thence to the mouth of the *Tyne*, and even to *Dunstanbrough* in *Northumberland*, the shore is sandy, and the land in a few places rocky; but from thence to *Bamborough*, the coasts are high and rocky, in many places run far into the sea, and at low tides shew their heads above water.

Bamborough castle stands on the last of the range of rocky cliffs. This fortress was founded by the Saxon monarch *Ida*. After various fortunes it, has proved in its dismantled state of more use to mankind than when it boasted some potent lord and fierce warders. A charitable prelate of the see of *Durham* purchased the estate, and left it for the use of the distressed seamen who might suffer shipwreck on this dangerous coast, and to unconfined charitable purposes, at the discretion of certain trustees. The poor are, in the dearest seasons, supplied with corn at a cheap rate; the wrecked, found senseless and benumbed with cold, are taken instantly into these hospitable walls, and restored to life by the assistance of food, medicine, and warm beds; and if the ship is capable of relief, that also is saved, by means of machines always ready for the purpose*.

FARN ISLES.

The *Farn islands*, or rather rocks, form a group at no great distance from shore; the nearest a mile and sixty-eight chains; the farthest about seven. These probably, at some remote period, have been convulsed from the land, but now divided from it by a furious tide, rushing through a channel from five to twelve fathoms in depth. The original sea, to the east of the *Staples*, the remotest rocks, suddenly deepens to forty or fifty fathoms. *St. Cuthbert* first made these rocks of note: he occasionally made the largest of them the seat of his devotion and seclusion from the world; expelling, says superstition, the malignant spirits, the pre-occupants. Some remains of a chapel are still to be seen on it. For ages past, the sole tenants are a few cows, waisted over from the main land in the little cobbles, or boats of the country; and the Eider Ducks, *Arch. Zool.* ii. N^o 480, still distinguished here by the name of the Saint. Numberless sea-fowls, and of great variety of kinds, possess the remoter rocks, on which they find a more secure retreat than on the low-cliffed shores. To the marine feathered tribe the whole coast from *Flamborough* head to that of *St. Ebb's* is inhospitable. They seek the loftiest promontories. Where you hear of the haunts of the Razor-bills and Guillemots, Corvorants and Shags, you may be well assured, that

* *Tour in Scotland*, 1769; and fuller in *Mr. Hutchinson's Northumberland*, ii. 176.

† *Adair. Hammond. Thompson.*