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XX. *An Essay on the periodical Appearing and Disappearing of certain Birds, at different Times of the Year. In a Letter from the Honourable Daines Barrington, Vice-Pref. R. S. to William Watson, M. D. F. R. S.*

DEAR SIR,

Read April 2, 9, 30,
and May 14, 1772.

AS I know, from some conversation we have had on this head, that you consider the migration of birds as a very interesting point in natural history, I send you the following reflections on this subject as they have occurred to me upon looking into most of the ornithologists who have written on this question.

It will be first necessary in the present, as in all other disputes, to define the terms on which the controversy arises. I therefore premise that I mean by the word Migration, a periodical passage by a whole species of birds across a considerable extent of sea.

I do not mean therefore to deny that a bird, or birds, may possibly fly now and then from Dover to
Vol. LXII. M m Calais,

Calais, from Gibraltar to Tangier, or any other such narrow strait, as the opposite coasts are clearly within the bird's ken, and the passage is no more adventurous than across a large fresh water lake.

I as little mean to deny that there may be a periodical flitting of certain birds from one part of a continent to another : the Royston Crow, and Rock Ouzel, furnish instances of such a regular migration.

What I mean chiefly to contend therefore is, that it seems to be highly improbable, birds should, at certain seasons, traverse large tracts of sea, or rather ocean, without leaving any of the same species behind, but the sick or wounded.

As this litigated point can only receive a satisfactory decision from very accurate observations, all preceding naturalists, from Aristotle to Ray, have spoken with much doubt concerning it.

Soon after the appearance of *Monf. Adanson's* voyage to Senegal, however, *Mr. Collinson* first, in the *Philosophical Transactions* *, and after him the most eminent ornithologists of Europe, seem to have considered this traveller's having caught four European Swallows on the 6th of October, not far from the African coast, as a decisive proof, that the common swallows, when they disappear in Europe, make for Africa during the winter, and return again to us in the spring.

It is therefore highly incumbent upon me, who profess that I am by no means satisfied with the account, given by *Monf. Adanson* of these European

* Part II. 1760, p. 459, & seq.

swallows, to enter into a very minute discussion of what may, or may not, be inferred from his observation according to his own narrative.

I shall first however consider the general arguments, from which it is supposed that birds of passage periodically traverse oceans, which indeed may be almost reduced to this single one, *viz.* we see certain birds in particular seasons, and afterwards we see them not; from which data it is at once inferred, that the cause of their disappearance is, that they have crossed large tracts of sea.

The obvious answer to this is, that no well-attested instances can be produced of such a migration, as I shall endeavour to shew hereafter; but besides this convincing negative proof, there are not others wanting.

Those who send birds periodically across the sea, being pressed with the very obvious answer I have before suggested, have recourse to two suppositions, by which they would account for their not being observed by seamen during their passage.

The first is, that they rise so high in the air that they become invisible*; but unfortunately the rising to this extraordinary height, or the falling from it, is equally destitute of any ocular proof, as the birds being seen during their passage.

I have indeed conversed with some people, who conceive they have lost sight of birds by their perpendicular flight; I must own, however, that I have

* It is well known that some ornithologists have even supposed that they leave our atmosphere for that of the Moon. See Harl. Misc. Vol. II. p. 561.

always supposed them to be short-sighted, as I never lost the sight of a bird myself, but from its horizontal distance, and I doubt much whether any bird was ever seen to rise to a greater height than perhaps twice that of St. Paul's cross*.

There seems to be but one method indeed, by which the height of a bird in the air may be estimated; which is, by comparing its apparent size with its known one, when very near us; and it need not be said that method of calculating must depend entirely upon the sight of the observer, who, if he happens not to see objects well at a distance, will very soon suppose the bird to be lost in the clouds.

There is also another objection to the hypothesis of birds passing seas at such an extraordinary height, arising from the known rarefaction of the air, which may possibly be inconvenient for respiration, as well as flight; and if this was not really the case, one should suppose that birds would frequently rise to such uncommon elevations, when they had no occasion to traverse oceans.

* Wild geese fly at the greatest height of any bird I ever happened to attend to; and from comparing them with rooks, which I have frequently looked at, when perched on the crosses of St. Paul's, I cannot think that a wild-geese was ever diminished, to my sight at least, more than he would be at twice the height of St. Paul's, or perhaps 300 yards. Mr. Hunter, F. R. S. informs me, that the bird which hath appeared to him as the highest flier, is a small eagle on the confines of Spain and Portugal, which frequents high rocks. Mr. Hunter hath first seen this species of eagle from the bottom of a mountain, and followed it to the top, when the bird hath risen so high as to appear less than he did from the bottom. Mr. Hunter however adds, that he could still hear the cry, and distinguish the bird.

The

The Scotch Ptarmigan frequents the highest ground of any British bird, and he takes but very short flights.

But it is also urged by some, that the reason why seamen do not regularly see the migration of birds, is because they choose the night, and not the day, for the passage *.

Now though it may be allowed, that possibly birds may cross from the coast of Holland to the Eastern coast of England (for example) during a long night, yet it must be dark nearly as long as it is within the Arctic circle to afford time for a bird to pass from the Line to many parts of Europe, which Mons. de Buffon calculates, may be done in about eight or nine days †.

If the passage happened in half the nights of the year, which have the benefit of moonlight, the birds would be discovered by the sailors almost as well as in the day time; to which I must add that several supposed birds of passage (the Fieldfare in particular) always call when on their flight, so that the seamen must be deaf as well as blind, if such flocks of birds escape their notice.

Other objections however remain to this hypothesis of a passage during the night.

* Mr. Catesby supposes that they may thus pass in the night time, to avoid birds of prey. Phil. Trans. Abr. Vol. II. p. 887. But are not owls then stirring?

On the other hand, if they migrate in the day time, kites, hawks, and other birds of prey, must be very bad sportsmen not to attend (like Arabs) these large and periodical caravans.

† In the preface to the first volume of his lately published Ornithology, p. 32.

Most birds not only sleep during the night, but are as much incapacitated from distinguishing objects well as we are, in the absence of the sun: it is therefore inconceivable that they should choose owl-light for such a distant journey.

Besides this, the Eastern coast of England, to which birds of passage must necessarily first come from the continent, hath many light-houses upon it; they would therefore, in a dark night, immediately make for such an object, and destroy themselves by flying with violence against it, as is well known to every bat-fowler.

Having endeavoured to answer these two suppositions, by which it is contended that birds of passage may escape observation in their flight; I shall now consider all the instances I have been able to meet with of any birds being actually seen whilst they were crossing any extent of sea, though I might give a very short refutation to them, by insisting, that if this was ever experienced, it must happen as constantly in a sea, which is much navigated, as the return of the seasons.

I cannot do better than to follow these according to chronological order.

The first in point of time is that which is cited by Willoughby*, from Bellon, whose words are thus translated, “ When we sailed from Rhodes to
“ Alexandria, many quails flying from the North
“ towards the South, were taken in our ship, whence
“ I am persuaded that they shift places; for formerly, when I sailed out of the Isle of Zant to
“ Morea, or Negropont, in the spring, I had ob-

* B. II. c. 11. §. 8.

“ served

“ served quails flying the contrary way to N. and S.
 “ that they might abide there all summer, at which
 “ time also a great many were taken in the ship.”

Let us now consider what is to be inferred from this citation.

In the first place, Bellon does not particularize the longitude and latitude of that part of the Mediterranean, which he was then crossing; and in his course from Rhodes to Alexandria, both the islands of Scarpanto and Crete could be at no great distance: these quails therefore were probably flitting from one island of the Mediterranean * to another.

The same observation may be made with regard to the quails which he saw between Zant and Negropont, as the whole passage is crowded with islands, they therefore might be passing from island to island, or headland to headland, which might very probably lye East and West, so as to occasion the birds flying in a different direction, from which they passed the ship before.

I have therefore no objection to this proof of migration, if it is only insisted upon to shew that a quail shifts its station at certain seasons of the year; but cannot admit that it is fair from hence to argue that these birds periodically cross large tracts of sea.

Bellon himself states, that when the birds settled upon the ship, they were taken by the first person who chose to catch them, and therefore they must have been unequal to the short flight which they were attempting.

* One of the Mediterranean islands is supposed to have obtained its ancient name of Ortygia from the numbers of quails.

It is very true that quails have been often pitched upon as instances of birds that migrate across seas, because they are scarcely ever seen in winter: it is well known, however, to every sportsman, that this bird never flies 300 yards at a time, and the tail being so short, it is highly improbable they should be equal to a passage of any length.

We find therefore, that quails, which are commonly supposed to leave our island in the winter, in reality retire to the sea coasts, and pick up their food amongst the sea weeds *.

I have happened lately to see a specimen of a particular species of quail, which is described by Dr. Shaw†, and is distinguished from the other kinds by wanting the hind-claw.

Dr. Shaw also states that it is a bird of passage. Now if quails really migrate from the coast of Barbary to Italy, as is commonly supposed, whence can it have arisen that this remarkable species hath escaped the notice of Aldrovandus, Olina, and the other Italian ornithologists?

When I had just finished what I have here said with regard to the migration of quails, I have had an opportunity of seeing the second volume of Mons. de Buffon's ornithology‡; where, under this article, he contends that this bird leaves Europe in the winter.

It is incumbent upon me, therefore, either to own I am convinced by what this most ingenious and able naturalist hath urged, or to give my reasons why I

* See Br. Zool. Vol. II. p. 210. 2d Ed. octavo.

† *Phyf. Obs. on the kingdom of Algiers*, ch. 2.

‡ See p. 459, & seq.

still continue to dissent from the opinion he maintains.

Though M. de Buffon hath discussed this point very much at large, yet I find only the following facts or arguments to be new.

He first cites the Memoirs of the Academy of Sciences *, for an account given by M. Godeheu of quails coming to the island of Malta in the month of May, and leaving it in September.

The first answer to this observation is, that the island of Malta is not only near to the coast of Africa, but to several of the Mediterranean islands; it therefore amounts to no more than the flitting I have before taken notice of †.

Monf. de Buffon supposes that a quail only quits one latitude for another, in order to meet with a perpetual crop on the ground.

Now can it be supposed that there is that difference between the harvest on the coast of Africa, and that of the small quantity of grain which grows on the rocky island of Malta, that it becomes inconvenient to the bird to stay in Africa as soon as May sets in; and necessary, on the other hand, to continue in Malta from May till September.

Monf. de Buffon then supposes that quails make their passage in the night, as well as conceives them to be of a remarkably warm temperature ‡, and says

* Tom. III. p. 91 and 92.

† Both Monf. de Godeheu and M. de Buffon seem to conceive that the quail should fly in the same direction as the wind blows; but birds on the wing from point to point, which are at a considerable distance, fly against the wind, as their plumage is otherwise ruffled.

‡ As this is given for a reason why the African quails migrate Northward: Q. what is to become of the Icelandic quails during the summer?

that “ *chaud comme une caille*,” is in every one’s mouth *.

Now in the first place their migration during the night, is contrary to Belon’s account, which M. de Buffon so much relies upon, who expressly says, that the birds were caught in the day time †.

In the next place, I apprehend that “ *chaud comme une caille*,” alludes to the very remarkable falaciousness of this bird, and not to the constant heat of its body.

Monf. de Buffon then observes, that if quails are kept in a cage, they are remarkably impatient of confinement in the autumn and spring, whence he infers that they then want to migrate ‡; he also adds, in the same period, that this uneasiness begins an hour before the sun rises, and that it continues all the night.

This great naturalist does not state this observation as having been made by himself, and it seems upon the face of it to be a very extraordinary one.

* All birds indeed are warmer by four degrees than other animals. See some ingenious thermometrical experiments by Mr. Martin of Aberdeen, Edinb. 1771, 12mo.

† Upon looking a second time into Belon, he does not indeed state whether it was in the day or the night; but if it had happened in the latter, this traveller and ornithologist could not well have omitted such a circumstance. Besides this, he mentions in what direction the quails were flying, which he could not have discerned in the night.

‡ It may also arise from this bird’s being of so quarrelsome a disposition, and consequently most likely to fight with its fellow prisoners when they are all in greatest vigour after moulting, and on the return of the spring.

M. de Buffon allows that they will fight for a grain of millet, and adds, “ *car parmi les animaux il faut un sujet reel pour se battre.*” M. de Buffon hath never been in a cockpit.

No.

No one (at least with us) ever keeps quails in a cage except the poulterers, who always sell them as fast as they are fat, and consequently can give no account of what happens to them during so long an imprisonment as this observation necessarily implies.

No such remarkable uneasiness hath ever been attended to in any other supposed bird of passage during its confinement; but, allowing the fact to be as M. de Buffon states, he himself supplies us with the real cause of this impatience.

He asserts, that quails constantly moult twice * a year, *viz.* at the close both of summer and winter; whence it follows, that the bird, in autumn and the spring, must be in full vigour upon its recovery from this periodical illness: it can therefore as little brook confinement, as the physician's patient upon the return of health after illness.

Thus much I have thought it necessary to say, in answer to M. de Buffon, who "dum errat, docet," who scarcely ever argues ill but when he is misinformed as to facts, and who often, from strength of understanding, disbelieves such intelligence as might impose upon a naturalist of less acuteness and penetration.

* I have often heard that certain birds moult twice a year, some of which I have kept myself without their changing their feathers more than once.

I should suppose that this notion arises from some birds not moulting regularly in the autumn every year; and when the change takes place in the following spring, they very commonly die: I can scarcely think that many of them are equal to two illnesses of so long a continuance, which are constantly to return within twelvemonths.

I should therefore rather account for the extraordinary briskness of a quail in autumn and the spring, from its recovery after moulting in the former, and from the known effects of the spring as to most animals in the latter.

The next instance of a bird being caught at any distance from land, is in Sir Hans Sloane's voyage to Jamaica, who says, that a lark was taken in the ship 40 leagues from the shore: this therefore was certainly an unfortunate bird, forced out to sea by a strong wind in flying from headland to headland, as no one supposes the skylark to be a bird of passage.

The same answer may be given to a yellow-hammer's settling upon Hasselquist's ship in the entrance of the Mediterranean, with this difference, that either the European or African coast must have been much nearer than 40 leagues*.

The next fact to be considered is what is mentioned in a letter of Mr. Peter Collinson's, printed in the Philosophical Transactions†.

He there says, " That Sir Charles Wager had frequently informed him, that in one of his voyages home in the spring as he came into soundings in our channel, that a great flock of swallows almost covered his rigging, that they were nearly spent and famished, and were only feathers and bones; but being recruited by a night's rest, they took their flight in the morning."

The first answer to this is, that if these were birds which had crossed large tracts of sea in their periodical migrations, the same accident must happen eternally, both in the spring and autumn, which is not however pretended by any one.

In the next place, the swallows are stated to be spent both by famine and fatigue; and how were they to procure any flies or other sustenance on the

* See Hasselquist's Travels, in princ.

† 1760. Part II. p. 461.

rigging of the admiral's ship, though they might indeed rest themselves?

Sir Charles, however, expressly informs us, that he was in the channel, and within soundings: these birds, therefore (like Bellon's quails) were only passing probably from headland to headland; and being forced out by a strong wind, were obliged to settle upon the first ship they saw, or otherwise must have dropped into the sea, which I make no doubt happens to many unfortunate birds under the same circumstances.

As the birds which thus settled upon Sir Charles Wager's rigging were swallows, it very naturally brings me now to consider the celebrated observation of Monf. Adanson, under all its circumstances, as it hath been so much relied upon, and by naturalists of so great eminence.

Monf. Adanson is a very ingenious writer, and the publick is much indebted to him for many of the remarks which he made whilst he resided in Senegal.

I may, however, I think, presume to say, that he had not before his voyage made ornithology his particular study; proofs of which are not wanting in other parts of his work, which do not relate to swallows.

For example, he supposes, that the Canary birds which are bred in Europe are white, and that they become so by our climate's being more cold than that of Africa.

“ J'ai remarqué que le serin qui devient tout blanc
 “ en France, est a Teneriffe d'un gris presque aussi
 “ foncé que celui de la linotte; ce changement de
 “ couleur provient vraisemblablement de la froidure
 “ de notre climat *.”

* Voyage au Senegal, p. 13.

Mr.

Mr. Adanson in this passage seems to have deduced two false inferences from having seen a few white Canary birds in France, which he afterwards compares with those of Teneriff, and supposes the change of colour to arise merely from alteration of climate : it is known, however, almost to every one, that there is an infinite variety in the plumage of the European Canary birds, which, as in poultry, arises from their being pampered with so much food, as well as confinement *.

Monf. Adanson, in another part of his voyage †, describes a Roller, which he supposes to migrate sometimes to the Southern parts of Europe.

This circumstance shews that he could not have looked much into books of natural history, because the principal synonym of this bird is *garrulus Argentoratenfis* ‡ ; and Linnæus informs us that it is found even in Sweden ||.

* In the same passage, he compares the colour of the African Canary bird to that of the European linnet, and says it is *d'un gris presque aussi foncé*, whereas the European linnet is well known to be brown, and not grey. The linnet affords a very decisive proof that the change of plumage does not arise from the difference of climate, but the two causes I have assigned. The cock bird, whilst at liberty, hath a red breast : yet if it is either bred up in a cage from the nest, or is caught with its red plumage, and afterwards moults in the house, it never recovers the red feathers.

That most able naturalist, Monf. de Buffon, from having seen some cock linnets which had thus moulted off, or perhaps some hen linnets (which have not a red breast) considers them as a distinct species, and compares their breeding together in an aviary, to that of the Canary bird and goldfinch. Ornith. p. xxii.

† P. 16. ‡ Or of Strasburgh.

|| Faun. Suec. 94.

The strong characteristic mark of this bird, is the outermost feathers of the tail, which able naturalists describe as three fourths of an inch longer than the rest *. Monsf. Adanson, however, compares their length, not with the other feathers of the tail, but with the length of the bird's body, which is by no means the natural or proper standard of comparison.

The reason of my taking notice of these more minute inaccuracies in Monsf. Adanson's account of birds, arises from Mr. Collinson's relying upon his observations with regard to swallows being so absolutely decisive, because he is represented to be so able a naturalist.

I shall now state (very minutely) under what circumstances these swallows were caught, and what seems to be the true inference from his own account.

He informs us, that four swallows settled upon the ship, not 50 leagues from the coast of Senegal, on the 6th of October; that these birds were taken, and that he knew them to be the true swallow of Europe†, which he supposes were then returning to the coast of Africa.

I shall now endeavour to shew that these birds could not be European swallows; nor, if they were, could they have been on their return from Europe to Africa.

* Willoughby, p. 131. Br. Zool. Vol. II. in append.

† I have before endeavoured to shew that Monsf. Adanson does not always recollect with accuracy the plumage of the most common European birds, by what he says with regard to the linnet.

The word *hirondelle*, in French, is used as a general term for the four * species of these birds, as the term *swallow* is with us.

Now the four swallows thus caught and examined by Monf. Adanson were either all of the same species, or intermixed in some other proportion.

Would not then any naturalist in stating so material a fact (as he himself supposes it to be) have particularized of what species of swallow these very interesting birds were?

Should not Monf. Adanson also have taken care to distinguish these supposed European swallows from two species of the same tribe, which bear a general resemblance to those of Europe, and are not only described, but engraved by Brisson, under the name of *Hirondelle de Senegal* & *Hirondelle de rivage du Senegal* †?

Though Monf. Adanson was above a year on this part of the African coast, paid so much attention to swallows, and was so immediately acquainted with the different species on the first inspection, yet he seems never to have discovered that there were such African swallows as are thus described and engraved by Brisson, though he must have seen them daily.

Monf. Adanson however concludes his account of the supposed European swallow, whilst it continues on the coast of Senegal, by a circumstance which

* *Viz.* the swallow καὶ ἐξοχόν, the martin, the sand martin, and the swift: I omit the goatsucker, because this bird, though properly classed as a species of swallow by ornithologists, is not so considered by others.

† See Brisson, Tom. II. pl. xiv.

seems to prove to demonstration of what species the four swallows caught in the ship really were.

He says that they roost on the sand either by themselves, or at most only in pairs, and that they frequent the coast much more than the inland parts *.

These swallows therefore, if they came from Europe, must have immediately changed at once their known habits: and is it not consequently most clear that they were of that species which Brisson describes under the name of *Hirondelle de rivage du Senegal*?

But though it should be admitted, notwithstanding what I have insisted upon, from Mons. Adanson's own account, that these were really swallows of the same kind with those of Europe; yet I must still contend that they could not possibly have been on their return from Europe to Africa, because the high road for a bird from the most Western point of Europe to Senegal, is along the N. West coast of Africa, which projects greatly to the Westward of any part of Europe.

What then could be the inducement to these four swallows to fly 50 leagues to the Westward of the coast of Senegal, so much out of the proper direction?

It seems to me therefore, very clear, that these swallows (whether of the European kind or not) were flitting from the cape de Verde islands to the

* Voyage au Senegal, p. 67. I wish Mons. Adanson had also informed us whether these swallows had the same notes with those of Europe, which is a very material circumstance in the natural history of birds, though little attended to by most ornithologists.

coast of Africa, to which short flight, however, they were unequal, and were obliged from fatigue to fall into the sailors hands.

Monf. Adanson likewise mentions * that the ship's company caught a Roller on the 26th of April, which he supposes was on its passage to Europe, though he was then within sight of the coast of Senegal: this bird, however, must be admitted not to have had sufficient strength to reach the first stage of this round-about journey, and was therefore probably forced out to sea by a strong wind, in passing from head-land to head-land.

But I must not dismiss what hath been observed with regard to the swallows seen by Monf. Adanson at Senegal, without endeavouring also to answer what M. de Buffon hath not only inferred from it, but hath endeavoured to confirm by an actual experiment †.

M. de Buffon, from the many instances of swallows being found torpid even under water, very readily admits, that all the birds of this genus do not migrate, but only that species which was seen by Monf. Adanson in Africa, and which he generally refers to as the chimney swallow ‡; but from the outset, seems

* Voyage au Senegal, p. 15.

† See the two prefatory discourses to his sixteenth volume of natural history.

‡ So little do naturalists know of this very common bird, that I believe it hath never yet been observed by any writer, that the male swallow hath only the long slender feathers in the tail, which are considered as its most distinguishing marks. I venture to make this remark upon having seen the difference in two swallows which are in Mr. Tunstall's collection, F. R. S. as also in two others, which have lately been presented to the Museum

to shew that he hath himself confounded this species with the martin.

“ Prenons un seul oiseau, par exemple, l'hirondelle, celle que tout le monde connoit, qui paroît au printems, dispaeroit en automne, & fait son nid avec de la terre contre les fenetres, ou dans les cheminées.” p. 23.

It is very clear that the design in this period is to specify a particular bird in such a manner that no doubt could remain with any one about the species referred to; and from other passages which follow, it is as clear that Monf. de Buffon means to allude to the swallow *κατ' ἐξοχην*.

Though this was certainly the intention of this most ingenious naturalist, it is to me very evident that the martin, and not the swallow, was in his contemplation, because he first speaks of the bird's building against windows, before he mentions chimneys, and therefore supposes that either place is indifferent; which is not the case, because the swallow seldom builds on the sides of windows, or the martin in chimneys.

There are perhaps three or four martins to one swallow in all parts; and from their being the more common bird of the two, as well as from the circumstance of their building at the corner of windows (and consequently being eternally in our sight), nine-

of the Royal Society, by the directors of the Hudson's Bay company.

These long feathers would be very inconvenient to the hen during incubation; and they are likewise confined to the cock *widow-bird*, as, from their more extraordinary length, they would be still more so.

teen out of twenty, when they speak of a swallow, really mean a martin*.

I only take notice of this supposed inaccuracy in *Monf. de Buffon*, because, if that able naturalist does not speak of the different sorts of swallows with that precision which is necessary upon such an occasion, why should he rely so intirely upon the impossibility of *Monf. Adanson's* being mistaken?

I shall now state the experiment of *Monf. de Buffon*, to prove that the swallow is not torpid in the winter, and must therefore migrate to the coast of Senegal†.

He shut up some swallows (*hirondelles*) in an ice house, which were there confined “plus ou moins de temps;” and the consequence was, that those which remained there the longest died, nor could they be revived by exposing them to the sun; and, that those “qui n’avoient souffert le froid de la “glaciere que pendant peu de tems” were very lively when permitted to make their escape.

* In the same manner the generical name in other languages, for this tribe of birds, always means the martin, and not the swallow.

Thus *Anacreon* complains of the *χελιδων* for waking him by its twittering.

Now if it be considered that there was only the kitchen chimney in a Grecian house, it must have been the martin which built under the eaves of the window, that was troublesome to *Anacreon*, and not the swallow.

Ovid also speaking of the nest of the *hirundo*, says,

— luteum sub trabe figit opus.

by which he necessarily alludes to the martin, and not the swallow.

† *Plan de l'ouvrage*, p. 15.

Monf.

Monf. de Buffon does not, in this account of his experiment, state the time during which the birds were confined; but as the trial must have been made in France, the swallows which he procured could not be expected to be torpid either in an ice-house * or any other place, because the season for their being in that state was not yet arrived.

I cannot also agree with M. de Buffon that those birds which were shut up the longest time died through cold, as he supposes, but for want of food, as he neither supplied them with any flies, nor, if he had, could the swallows have caught them in the dark: a very short fast kills these tender animals, which are feeding every instant when on the wing.

It therefore seems not to follow from this, or any other experiment, that swallows must necessarily migrate (as Monf. de Buffon supposes) to the coast of Senegal.

* The very name of an ice-house almost strikes one with a chill; I placed, however, a thermometer in one near Hyde Park Corner, on the 23d of November, where it continued 48 hours, and the mercury then stood at $43\frac{1}{2}$ by Fahrenheit's scale.

This is therefore a degree of cold which swallows sometimes experience whilst they continue in some parts of Europe, without any apparent inconvenience; and it should seem that the cold vapours which may arise from the included ice, sink the thermometer only 7 or 8 degrees, as the temperature in approved cellars is commonly from 50 or 51 throughout the year.

Sir William Hamilton informs me, that he hath frequently seen swallows in the winter between Naples and Puzzuoli, when the weather was warm; as does Mr. Hunter, F. R. S. that he hath observed them during the same season, on the confines of Spain and Portugal. It should seem from this, that very mild and warm weather for any continuance always wakes these birds from their state of torpidity.

Swallows

Swallows are seen during the summer, in every part of Europe from Lapland to the Southern coast of Spain; nor is Europe vastly inferior in point of size to Africa.

If swallows therefore retreat to Africa in the winter, should not they be dispersed over the whole Continent of Africa, just as they are over every part of Europe?

But this most certainly is not so: Dr. Shaw, who was a very good naturalist and attended much to the birds in the neighbourhood of Algiers (as appears by his account of that country), makes no mention of any such circumstance, nor have we heard of it from any other traveller*.

It must be admitted indeed, that Herodotus speaking of a part of upper Egypt (which he had never seen) says, that kites and swallows never leave it†; this, however, totally differs from Mons. Adanson's account, who informs us that they disappear in Senegal on the approach of summer.

It seems to follow therefore, from this silence in others, that swallows cannot be accommodated for their winter residence in any part of that vast continent, but in the neighbourhood of Senegal.

But this is not the whole objection to such an hypothesis.

* It may also be observed here, that credit is in some measure given to M. Adanson's eyesight, against that of all the English, French, Dutch, Portugeze, and Danes, who have been settled not far from Senegal for above a century, many of which have spent the greatest part of their lives there, and whose notice, swallows seen during the winter, must have probably attracted.

† *Ἰκτίνες δὲ καὶ χελιδόνες δι' ἐλῆος ἐοῦτες ἐκ ἀπολειπῆσι.* Euterpe, p. 98. ed. Gale.

If

If the swallows of Europe, when they disappear in those parts, retreat to the coast of Senegal, what necessarily follows with regard to a Lapland swallow?

I will suppose such a bird to have arrived safely at his winter quarters upon the approach of that season in Lapland; but he must then, according both to Monsr. Adanson's and de Buffon's account, return to Lapland in the spring, or at least some other swallow from Senegal fill his place*.

Such a bird immediately upon its arrival on the Southern coast of Spain would find the climate and food which it desired to attain, and all proper conveniences for its nest: what then is to be its inducement for quitting all these accommodations which it meets with in such profusion, and pushing on immediately over so many degrees of European continent to Lapland, where both martin and swallow can procure so few eaves of houses to build upon? What also is to be the inducement to these birds, when they have arrived at that part of the Norwegian coast which is opposite to the Ferroe islands, to cross degrees of sea, in order

* Mr. Stephens, A. S. S. informs me, that there was a nest of martins for twenty years together in the hall of his house in Somersetshire (near Bath); nor could the old birds procure food either for themselves, or their young, till the door was opened in the morning.

Can it be supposed that the same birds or their descendants could have so long fixed upon so very inconvenient a spot, to which they constantly returned from the coast of Africa, neglecting so many others, which they must have always passed by? Does it not also afford a most strong presumption, that they were torpid during winter in the neighbourhood of this old hall?

to build in such small spots of land, where there are still fewer houses?

The next fact I have happened to meet with of a bird's being seen at a considerable distance from the shore, is in Mr. Forster's lately published translation of Kalm's account of N. America*.

We are there informed that a bird (which Kalm calls a swallow) was seen near the ship on the 2d of September, and, as he supposes, 20 degrees from the continent of America†.

It appears however, by what he before states in his journal, that the ship was not above 5 degrees from the island of Sable.

Besides, if it is contended that this was an European swallow on its passage across the Atlantic on the 2d of September, it is too early even for a swift, to have been on its migration, which disappears with us sooner than the three other species of European swallows‡.

Only two more instances have occurred of birds being seen in *open* sea that have been described

* Vol. I. p. 24.

† It may not be improper here to observe, that in all instances of birds being seen at sea any great distance from the coast, it is not improbable that they may have before settled on some other vessel, or perhaps on a piece of floating wreck.

By accidents of this sort, even butterflies have sometimes been caught by the sailors at 40 leagues distance from any land. See Mons. l'Abbé Courte de la Blanchadiere's Voyage to Brazil, Paris, 1759, 21mo. p. 169.

‡ The bird mentioned by Kalm was probably an American swallow, forced out to sea by some accidental storm: there are several species of them and they seem to bear a general affinity to those of Europe.

with any sort of precision, which I shall just state, as I would not decline giving the best answer I am able to every argument and fact which may be relied upon, by those who contend that birds periodically migrate across oceans.

On the 30th of March, 1751, Osbeck, in his voyage from Sweden to China *, met with a single house swallow near the Canary Islands, which was so tired that it was caught by the sailors: Osbeck also states, that though it had been fine weather for several preceding days, the bird was as wet as if it had just emerged from the bottom of the sea.

If this instance proves any thing, it is the submersion and not the migration of swallows so generally believed in all the northern parts of Europe. It would swell this Letter to a most unreasonable size, to touch only upon this litigated point; and I shall, for the present, suppress what hath happened to occur to me on this controverted question †.

* See the lately published translation of this voyage.

† I will, however, mention one most decisive fact on this head.

Mr. Stephens, A. S. S. informs me, that, when he was fourteen years of age, a pond of his father's (who was vicar of Shrivenham in Berkshire) was cleaned, during the month of February; that he picked up himself a cluster of three or four swallows (or martins), which were caked together in the mud, and that he carried them into the kitchen, on which they soon afterwards flew about the room, in the presence of his father, mother, and others. Mr. Stephens also told me, that his father (who was a naturalist) observed at the time, he had read of similar instances in the northern writers. This fact is also confirmed to me by the Reverend Dr. Pye, who was then at school in Shrivenham, as also by a very sensible land-surveyor, who now lives in the village.

Osbeck afterwards, in the course of his voyage, mentions, that a swallow (indefinitely) followed the ship, near Java, on the 24th of July, and another on the 14th of August, in the Chinese sea, as he terms it.

After what I have observed before with regard to other instances of the same sort, I need scarcely say that this naturalist does not state of what species these swallows were; and that, from the latitudes in which they were seen, they must have been some of the Asiatic kinds.

I cannot, however, dismiss this article of the swallow, without adding some general reasons, which seem to prove the great improbability of this or any other bird's periodically migrating over wide tracts of sea; and I the rather do it in this place, because

There are several reasons why swallows should not be frequently thus found; ponds are seldom cleaned in the winter, as it is such cold work for the labourers; and the same instinct which prompts the bird thus to conceal itself, instructs it to choose such a place of security, that common accidents will not discover it.

But the strongest reason for such accounts not being more numerous, is, that facts of this sort are so little attended to; for though I was born within half a mile of this pond, and have always had much curiosity with regard to such facts, yet I never heard a syllable about this very material and interesting account, till very lately.

To this fact I must also add, that swallows may be constantly taken in the month of October, during the dark nights, whilst they sit on the willows in the Thames, and that one may almost instantaneously fill a large sack with them, because at this time they will not stir from the twigs, when you lay your hands upon them. This looks very much like their beginning to be torpid before they hide themselves under the water.

A man near Brentford says, that he hath caught them in this state in the eyt opposite to that town, even so late as November.

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the swallow is commonly pitched upon as the most notorious instance of such a regular passage.

This seems to arise first from its being seen in such numbers during the summer, from its appearing almost always on the wing, and from its feeding in that position; from which two latter circumstances it is supposed to be the best adapted for such distant migrations.

And first, let us consider, from the few facts or reasons we have to argue from, what length of flight either a swallow or any other bird is probably equal to.

A swallow, it is true, seems to be always on the wing; but I have frequently attended, as much as I could, on a particular one; and it hath appeared to me, that the bird commonly returned to its nest in eight or ten minutes: as for extent of flight, I believe I may venture to say, that these birds are seldom a quarter of mile from their mate or young ones; they feed whilst on the wing, and are perpetually turning short round to catch the insects, who endeavour to elude them as a hare does a greyhound.

It therefore seems to me, that swallows are by no means equal to long flights, from their practice during their summer residence with us.

I have long attended to the flight of birds; and it hath always appeared to me, that they are never on the wing for amusement (as we walk or ride), but merely in search of food.

The only bird which I have ever observed to fly without any particular point of direction, is the rook: these birds will, when the wind is high,

“ Ride in the whirlwind, and enjoy the storm.”

They never fly, however, at this time, from point to point, but only tumble in the air, merely for their diversion.

It seems, therefore, that birds are by no means calculated for flights across oceans, for which they have no previous practice : and they are, in fact, always so fatigued, that, when they meet a ship at sea, they forget all apprehensions, and deliver themselves up to the sailors.

Let us now consider another objection to the migration of the swallow, which *Monf. de Buffon* supposes may cross the Atlantic to the Line in eight days * ; and this not only from the want of rest, but of food, during the passage.

A swallow, indeed, feeds on the wing : but where is it to find any insects, whilst it is flying over a wide expanse of sea ? This bird, therefore, if it ever attempted so adventurous a passage, would soon feel a want of food, and return again to land, where it had met with a constant supply from minute to minute.

I am aware it may be here objected, that the swallow leaves us on the approach of winter, when soon no flying insects can be procured : but I shall hereafter endeavour to shew, that these birds are then torpid, and, consequently, can want no such food.

Another objection remains to the hypothesis of migration, which is, that birds, when flying from

* *Discours sur la nature des oiseaux*, p. 32.

point to point, endeavour always to have the wind against them *, as is periodically experienced by the London bird-catchers, in March and October, when they lay their nets for finging birds †.

The reason, probably, for birds thus flying against the wind is, that their plumage may not be ruffled, which indeed I have before had occasion to mention.

Let us suppose, then, a swallow to be equal to a passage across the Atlantic in other respects; how is the bird to be insured of the wind's continuing for days in the same quarter; or how is he to depend upon its continuing to blow against his flight with moderation? for who can suppose that a swallow can make his way to the point of direction, when buffeted by a storm blowing in the teeth of his intended passage ‡?

Lastly, can it be conceived that these, or any other birds, can be impelled by a providential instinct, regularly to attempt what seems to be attended with such insuperable difficulties, and what most frequently leads to certain destruction?

But it will still be objected, that as swallows regularly appear and disappear at certain seasons, it is incumbent upon those who deny their migration, to

* Kalm, in his voyage to America, makes the same observation, with regard to flying fish, and Valentine says, that if the wind does not continue to blow against the bird of paradise, it immediately drops to the ground.

† These birds, as it should seem, are then in motion; because, at those seasons, the ground is plowed either for the winter or lent corn.

‡ I have myself attended to swallows during a high wind, and have observed that they fly only in sheltered places, whilst they almost touch the surface of the ground.

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shew what becomes of them in Europe during our winter.

Though it might be answered, that it is not necessary, those who endeavour to shew the impossibility of another system or hypothesis, should from thence be obliged to set up one of their own; yet I shall, without any difficulty, say, that I at least am convinced swallows (and perhaps some other birds) are torpid during the winter.

I have not, I must own, myself ever seen them in this state; but, having heard instances of their being thus found, from others of undoubted veracity, I have not scarcely the least doubt with regard to this point.

It is, indeed, rather difficult to conceive why some ornithologists continue to withhold their assents to such a cloud of witnesses, except that it perhaps contradicts a favourite hypothesis which they have already maintained.

Why is it more extraordinary that swallows should be torpid during the winter, than that bats are found in this state, and so many insects, which are the food of swallows?

But it may be said, that as the swallows have crowded the air during the summer, in every part of Europe since the creation, and as regularly disappear in winter, why have not the instances of their being found in a torpid state been more frequent?

To this it may be answered, that though our globe may have been formed so many centuries, yet the inhabitants of it have scarcely paid any attention to the study of natural history, but within these late years.

As for the ancient Greeks and Romans, their dress prevented their being so much in the fields as we are; or, if they heard of a rather extraordinary bird in their neighbourhood, they had not a gun to shoot it: the only method of attaining real knowledge in natural history, depends almost entirely upon the having frequent opportunities of thus killing animals, and examining them when dead.

If they did not stir much in their own country, much less did they think of travelling into distant regions; want of bills of exchange, and of that curiosity which arises from our being thoroughly acquainted with what is near us at home, probably occasioned this; to which may also be added, the want of a variety of languages: scarcely any Greek seems to have known more than his own tongue, nor Roman more than two*.

Aristotle, indeed, began something like a system of natural history, and Pliny put down, in his common place-book, many an idle story; but, before the invention of printing, copies of their works could not be so generally dispersed, as to occasion much attention to what might be interesting facts for the natural historian.

In the sixteenth century, Gesner, Belon, and Aldrovandus, published some materials, which might be of use to future naturalists; but, in the seventeenth, Ray and Willoughby first treated this extensive branch of study, with that clearness of method,

*. It need be scarcely here mentioned also, that their navigation was confined to the Mediteranean, from the compass not having been then discovered.

perspicuity of description, and accuracy of observation, as hath not, perhaps, been since exceeded.

The works of these great naturalists were soon dispersed over Europe, and the merit of them acknowledged; but it so happened, that Sir Isaac Newton's amazing discoveries in natural philosophy making their appearance about the same time, engaged entirely the attention of the learned.

In process of time, all controversy was silenced by the demonstration of the Newtonian system; and then the philosophical part of Europe naturally turned their thoughts to other branches of science.

Since this period, therefore, and not before, natural history hath been studied in most countries of Europe; and consequently, the finding swallows in a state of torpidity, or on the coast of Senegal, during the winter, begins to be an interesting fact, which is communicated to the world by the person who observes it.

To this I may add, that the common labourers, who have the best chance of finding torpid birds, have scarcely any of them a doubt with regard to this point; and consequently, when they happen to see them in this state, make no mention of it to others; because they consider the discovery as neither uncommon or interesting to any one.

Molyneux, therefore, in the Philosophical Transactions *, informs us, that this is the general belief of the common people of Ireland, with regard to land-rails; and I have myself received the same answer from a person who, in December, found swallows torpid in the stump of an old tree.

* Phil. Trans. abr. Vol. II. p. 853.

Another reason why the instances of torpid swallows may not be expected so frequently, is, that the instinct of secreting themselves at the proper season of the year, likewise suggests to them, it's being necessary to hide themselves in such holes and caverns, as may not only elude the search of man, but of every other animal which might prey upon them; it is not therefore by any common accident that they are ever discovered in a state of torpidity.

Since the study of natural history, however, hath become more general, proofs of this fact are frequently communicated, as may appear in the *British Zoology* *.

That it may not be said, however, I do not refer to any instance which deserves credit, if properly sifted, I beg leave to cite the letter from Mr. Achard to Mr. Collinson, printed in the *Philosophical Transactions* †, from whence it seems to be a most irrefragable fact, that swallows ‡ are annually discovered in a torpid state on the banks of the Rhine. I shall also refer to Dr. Birch's *History of the Royal Society* ||, where it is stated, that the celebrated Harvey dissected

* See Vol. II. p. 250. *Brit. Zool. ill.* p. 13, 14. As also Mr. Pennant's *Tour in Scotland*, p. 199.

† 1763, p. 101.

‡ "Swallows or martins," are Mr. Achard's words, which I the rather mention, because Mr. Collinson complains that the species is not specified.

Mr. Collinson himself had endeavoured to prove, that sand martins are not torpid, *Phil. Transf.* 1760, p. 109. and concludes his letter, by supposing that all the swallow tribe migrates, therefore the swift is the only species remaining; for his friend Mr. Achard shews to demonstration, that swallows or martins are torpid; he does not, indeed, precisely state which of them.

|| Vol. IV. p. 537.

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some, which were found in the winter, under water, and in which he could not observe any circulation of the blood *.

Assuming it, therefore, from these facts, that swallows have been found in such a state, I would ask the partisans of migration, whether any instance can be produced where the same animal is calculated for a state of torpidity and, at the same time of the year, for a flight across oceans ?

But it may be urged, possibly, that if swallows are torpid when they disappear, the same thing should happen with regard to other birds, which are not seen in particular parts of the year.

To this I answer, that this is by no means a necessary inference : if, for example, it should be insisted that other birds besides the cuckow are equally careless with regard to their eggs, it would be immediately allowed that the argument arising from

* As the swallows were found in the winter, they must have been in a state of torpidity, as otherwise the animals must have been putrid.

I shall likewise here refer to *Phil. Trans. abr.* Vol. V. p. 33. where Mr. Derham says, that he heard a swift squeak in an hole of his house on the 17th of April ; but that, the weather being cold, it did not stir abroad for several days.

This seems to be a strong instance of a bird's first waking from a state of torpidity, but resuming its sleep on the weather being severe.

I shall close the proofs on this head (which I could much enlarge) by the oigned testimony of Sigismond, King of Poland, who affirmed on his oath, to the cardinal Commendon, that he had frequently seen swallows, which were found at the bottom of lakes. See the life of cardinal Commendon, p. 211. Paris, 1671. 4to.

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such supposed analogy could by no means be relied upon *.

It is possible, however, that some other birds, which are conceived to migrate, may be really torpid as well as swallows; and if it be asked why they are not sometimes also seen in such a state during the winter, the answer seems to be, that perhaps there may be a thousand swallows to any other sort of bird, and that they commonly are found torpid in clusters.

* I here suppose the common notion about the cuckow to be true; because both learned and ignorant seem equally to agree in the fact.

During the present summer, however, a girl brought a full feathered young cuckow to a gentleman's house, where I happened to be, who said, that it had been for several days before fed by another bird of equal size with itself; which therefore could not be a hedge-sparrow, or other small bird, but the parent cuckow.

I have also lately been favoured, by Mr. Pennant, with the following extract from a manuscript of Derham's on instinct.

“ The Rev. Mr. Stafford was walking in Glossop-dale in the Peak of Derbyshire, and saw a cuckow rise from its nest, which was on the stump of a tree, that had been some time felled, so as much to resemble the colour of the bird. In this nest were two young cuckows, one of which he fastened to the ground, by means of a peg and line, and very frequently, for many days, beheld the old cuckow feed these her young ones.”

It is not impossible, therefore, that this most general opinion will turn out like the supposed effects of the venom of the tarantula; and, indeed, it is difficult to conceive how so small a bird as a hedge-sparrow can feed a cuckow: it is also remarkable, that the witnesses often vary about the species of small bird thus employed.

It is possible, however, that the cuckow (though it may not hatch its young) may feed them, when grown too large for the foster parent.

If a single bird of any other kind happens to be seen in the winter, without motion or apparent warmth, it is immediately conceived that it died by some common accident.

I shall, however, without any reserve, say, that I rather conceive the notion which prevails with regard to the migration of many birds, may most commonly arise from the want of observation, and ready knowledge of them, when they are seen on the wing, even by professed ornithologists.

It is an old saying, that “ a bird in the hand is worth two in the bush;” and this holds equally with regard to their being distinguished, when those even who study natural history, have but a transient sight of the animal *.

If, therefore, a bird, which is supposed to migrate in the winter, passes almost under the nose of a Linnæan, he pays but little attention to it, because he cannot examine the beak, by which he is to class the bird. Thus I conceive, that the supposing a nightingale to be a bird of passage arises from not readily distinguishing it, when seen in a hedge, or on the wing †.

This bird is known to the ear of every one, by its most striking and capital notes, but to the eye of very

* An ingenious friend of mine makes always a very proper distinction between what he calls in-door and out-door naturalists.

Thomas Willisel, who assisted Ray and Willughby much with regard to the natural history of the animals of this island, never stirred any where without his gun and fishing-tackle.

† No two birds fly in the same manner, if their motions are accurately attended to.

few indeed ; because the plumage is dull, nor is there any thing peculiar in its make.

The nightingale sings perhaps for two months *, and then is never heard again till the return of the spring, when it is supposed to migrate to us from the continent, with redstarts, and several other birds.

That it cannot really do so, seems highly probable, from the following reasons.

This bird is scarcely ever seen to fly above twenty yards, but creeps at the bottom of the hedges, in search of maggots, and other insects, which are found in the ground.

If the swallow is not supplied with any food during its passage across oceans, much less can the nightingale be so accommodated ; and I have great reason to believe, from the death of birds in a cage, which have had nothing to eat for twenty-four hours, that these delicate and tender animals cannot support a longer fast, though using no exercise at all.

To this I may also add, that those birds which feed on insects are vastly more feeble than those whose bills can crack seed, and consequently, less capable of bearing any extraordinary hardships or fatigue.

But other proofs are not wanting, that this bird cannot migrate from England.

* Whilst it sings even, the bird can seldom be distinguished, because it is then almost perpetually in hedges, when the foliage is thickest, upon the first burst of the spring, and when no insects can as yet have destroyed considerable parts of the leaves.

Nightingales are very common in Denmark, Sweden, and Russia *, as also in every other part of Europe, as well as Asia, if the Arabic name is properly translated.

Now, if it is supposed that many of these birds which are observed in the southern parts of England, cross the German sea, from the opposite coast of the continent; why does not the same instinct drive those of Denmark to Scotland, where no such bird was ever seen or heard †?

But these are not all the difficulties which attend the hypothesis of migration; nightingales are agreed to be scarcely ever observed to the westward of Dorsetshire, or in the principality of Wales ‡, much less in Ireland.

I have also been informed, that these birds are not uncommon in Worcestershire, whereas they are excessively rare (if found at all) in the neighbouring county of Hereford.

Whence, therefore, can it arise, that this bird should at one time be equal to the crossing of seas, and at other times not travel a mile or two into an adjacent county? Does it not afford, on the other hand, a strong proof, that the bird really continues

* See Dr. Birch's History of the Royal Society, Vol. III. p. 189. Linnæi Fauna Suecica. and Biographia Britannica, art. FLETCHER; where it is said, that they have in Russia a greater variety of notes than elsewhere.

† Sir Robert Sibbald, indeed, conceives the nightingale to be a bird of North Britain; but, if I can depend upon many concurrent testimonies, no such bird is ever seen or heard so far northward at present, nor could I ever trace them in that direction further than Durham.

‡ I have, however, frequently seen the nightingale's congener (and supposed fellow-traveller) the redstart in Wales.

on the same spot during the whole year, but happens not to be attended to, from the reasons I have before suggested?

I am therefore convinced, that if I was ever to live in the country during the winter, I should see nightingales, because I should be looking after them, and I am accordingly informed, by a person who is well acquainted with this bird, that he hath frequently observed them during this season *.

If it be asked, why the nightingales are all this time mute? the answer is, that the same silence is experienced in many other birds, and this very muteness is, in part the cause why the bird is not attended to in winter.

I must now ask those who contend for the migration of a nightingale, what is to be its inducement for crossing from the continent to us? a swallow, indeed, may want flies in winter, if it stays in England; but a nightingale is just as well supplied with insects on the continent, as it can be with us after its passage †. I must also ask, in what other part of

* I find they have also been seen in France during the winter. See a treatise, intitled, *Aëdologue*, Paris 1751. p. 23.

† I have omitted the mention of a more minute proof, that this bird cannot migrate from the continent, from the having kept them for some years in a cage, and having been very attentive to their song.

Kircher (in his *Musurgia*) hath given us the nightingale's notes in musical characters, from which it appears that the song of a German nightingale differs very materially from that of an English one: now, if there was a communication by migration between the continent and England, the song of these birds would not so materially differ, as I may, perhaps, shew, by some experiments I have made, in relation to the notes of birds.

I have before mentioned, that Mr. Fletcher, who was ambassador from England to Russia in the time of Queen Elizabeth,
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the world this bird is seen during the winter? must it migrate to Senegal with the swallow?

I am persuaded likewise, that the cuckow never migrates from this island any more than the nightingale: this bird is either probably torpid in the winter, or otherwise is mistaken for one of the smaller kind of hawks*; which it would be likewise in the spring, was it not for its very particular note at that time, and which only lasts during courtship, as it does with the quail.

If there is fine weather in February, this bird sometimes makes this sort of call to its mate, whilst it is supposed to continue still on the continent.

An instance is mentioned by Mr. Bradley †, of not only a single cuckow, but several, which were heard in Lincolnshire, during the month of February; and that able naturalist Mr. Pennant informs me, another was heard near Hatcham in Shropshire, on the 4th of February in the present year ‡.

observed that the song of the Russian nightingale differed from that of the English.

* Mr. Hunter, F. R. S. informs me, that he hath seen cuckows in the island of Belleisle during the winter, which is not situated so much to the southward, as to make it improbable that they may equally continue with us.

† Works of Nature, p. 77.

‡ Mr. Pennant received this account from Mr. Plimly, of Longnor in Shropshire.

Thus likewise Mr. Edwards informs us, that the sea fowls near the Needles, which are commonly supposed to migrate in winter, appear upon the weather's being very mild. *Essays*, p. 197.

It is amazing how much the being interested to discover particular objects contributes to our readily distinguishing them.

I remember the being much surprized that a grey-headed game-keeper always saw the partridge on the ground before they rose, when I could not do the same. He told me, however, that the reason was, I lived in a time when the shooter had no occasion to give himself that trouble.

He then further explained himself, by saying, that when he was young, no one ever thought of aiming at a bird when on the wing, and consequently they were obliged to see the game before it was sprung. He added, that from this necessity he could not only distinguish partridges, but snipes and woodcocks, on the ground.

Another instance of the same kind, is the great readiness with which a person, who is fond of coursing, finds a hare fitting in her form : those, however, who are not interested about such sport, can scarcely see the hare, when it is under their nose, and pointed out to them.

But more apparent objects escape our notice, when we are not interested about them.

Ask any one, who hath not a botanical turn, what he hath seen in passing through a rich meadow, at the time it is most enamelled with plants in flower; and he will tell you, that he hath observed nothing but grass and daisies. If most gardeners even are in like manner asked whether the flowers of a bean grow on every side of the stalk, they will suppose that they do,

whereas they, in reality, are only to be found on one side.

The mouths of flounders are often turned different ways, which one would think could not well escape the observation of the London fishmongers; yet, upon asking several of them whether they had attended to this particular, I found they had not, till I shewed them the proof in their own shops.

A fishmonger, however, knows immediately whether a fish is in good eating order or not, on the first inspection; because this is a circumstance which interests him.

I shall, however, by no means suppress two arguments in favour of migration, which seem to require the fullest answer that can be given to them.

The first is, that there are certain birds, which appear during the winter, but disappear during the summer; and it may be asked, where such birds can be supposed to breed, if they do not migrate from this island.

These birds are in number four, viz. the snipe, woodcock, redwing, and fieldfare.

As for the snipe, I have a very short answer to give to the objection, as far as it relates to this bird; because it constantly breeds in the fens of Lincolnshire, Wolmar forest, and Bodmyn downs; it is therefore highly probable, that it does the same in almost every county of England.

I must own, however, that, till within these few years, I conceived the nest of a snipe was as rarely seen in England, as that of a woodcock or fieldfare; and that able ornithologist Mr. Edwards supposes this to
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be the fact, in the late publication of his ingenious *Essays on Natural History* *.

Woodcocks likewise are known to build in some parts of England every year; but, as the instances are commonly those of a single nest, I would by no means pretend to draw the same proof against the summer migration of this bird, as in the former case of the snipe.

I will most readily admit, that these accidental facts are rather to be accounted for, perhaps, from the whimsy or silliness of a few birds, which occasions their laying their eggs in a place where they are easily discovered, and contrary to what is usual with the bulk of the species.

I remember to have seen a duck's nest once on the top of a pollard willow, near the decoy in St. James's Park; it would not be, however, fair to infer from such an instance, that all ducks would pitch upon the same very improper situation for a nest, upon which it is difficult to conceive how a web-footed bird could fettle.

Some silly birds likewise now and then choose a place for building, which cannot escape the observation of either man or beast, as he passes by.

I therefore suppose that the few proofs of woodcocks nests having been found in England, arise either from one or other of these two causes, and all which they seem to prove is, that our climate in summer is not absolutely improper for them.

It is to be observed, however, that Mr. Catesby considers such instances as of equal force against the

migration of the woodcock, as of the snipe *. Wil-
lughby also says, that Mr. Jessop saw young wood-
cocks sold at Sheffield (which rather implies a cer-
tain number being brought to market), and that
others had observed the same elsewhere †.

We are, indeed, informed by Scopoli ‡, that they
breed constantly in Carniola, which is considerably
to the southward of any part of England: our
country is therefore certainly not too hot for them.

Woodcocks appear and disappear almost exactly
about the same time in every part of Europe, and
perhaps Africa ||: heat and cold, therefore, seem
not to have any operation whatsoever with regard to
the supposed migration of this bird.

But it may be said, what signifies proving the
probability of woodcocks breeding in England, if it
is not a known fact that they do so?

To this it should seem there are several answers, as
it is equally incumbent upon those who contend for
migration, to shew that these birds were ever seen on
such passage.

Another answer is, ask ninety-nine people out of
a hundred, whether snipes ever make a nest in Eng-
land; and they will immediately say, that they
do not; so little are facts or observations of this sort
attended to.

But I shall now endeavour to give some other rea-
sons why woodcocks may not only continue with us

* Phil. Trans. abr. Vol. II. p. 889.

† B. iii. c. 1.

‡ Ornith. Leipzig, 1769.

|| Shaw's Trav. Phys. Obs. ch. ii.

during the summer, but also breed in large tracts of wood or bog, without being observed.

In the other parts of Europe, all birds almost are considered as game, or, at least, are eaten as wholesome food, Ray therefore mentions, that hawks and owls are sold by the poulterers at Rome; every sort of small bird also is equally the foreign fowler's object *.

An Englishman does not consider, on the other hand, perhaps twelve kinds of birds worthy his attention, or expence of powder, none of which are ever shot in our woods during the summer, nor are birds then disturbed by felling either coppice or timber.

But it will be said, why are not woodcocks sometimes seen, however, as they may be supposed to leave their cover in search of food?

To this I answer, that woodcocks sleep always in the daytime, whilst with us in the winter, and feed only during the night †. Whenever a woodcock, therefore, is flushed, he is roused from his sleep by the spaniel or sportsman, and then takes wing, because there are no leaves on the trees to conceal the bird.

Whoever hath looked attentively at a woodcock's eye, must see that, from the appearance of it, the

* In one of Boccace's Novels, a lover, who lives at Florence, dresses a falcon for the dinner of his mistress. *Giorna a V. Novel. IX.*

† Almost all the wild fowl of the duck kind also sleep in the daytime, and feed at night.

fight must be more calculated to distinguish objects by night than by day *.

The fact therefore is notorious to those who cut glades in their woods, and fix nets for catching these birds, that they never stir but as it begins to be dark, after which they return again by day-break, when their fight even then is so indifferent, that they strike against the net, and thus become entangled.

No one with us ever thinks of fixing or attending such nets in summer for woodcocks, because it is not then supposed that there is any such bird in the island; if they tried this experiment, however, I must own that I believe they would have sport †.

Mr. Reinhold Forster, F. R. S. who is an able naturalist, informs me, that the fowlers in the neighbourhood of Dantzick kill many woodcocks about St. John's day (or Midsummer), in the following man-

* I conceive also, it is from the eyes looking so dull; that this bird is generally considered as being so foolish: hence the Africans call the woodcock *hammar el badgel*, or the partridge's ass. Shaw's Phys. Obs. ch. ii.

† I would ask those who will probably laugh at the very idea of such sport (which I do not, however, absolutely insure), whether, if I was to send them to any part of the British coast to catch the true anchovy, or tunny fish, they would not suppose equally that it was a fool's errand.

Notwithstanding, however, this incredulity, I can produce the authority of both Ray (Syn. Pisc. p. 107.) and Mr. Pennant (Brit. Zool. ill. p. 34. 36.), that the true anchovy is caught in the sea not far from Chester, and the tunny fish on the coast of Argyleshire, together with the herrings, where they are called *mackrel sture*.

Is it not amazing, however, that a fish of such a size as the tunny should never have been heard of, even by the Scotch naturalist Sir Robert Sibbald?

ner, and that they continue to do so till the month of August.

They wait on the side of some of the extensive woods in that neighbourhood, before day-break, for the return of the woodcock from his feeding in the night-time, and always depend upon having a very good chance of thus shooting many of them.

The Dantzickers, however, might be employed the whole summer near these woods in the day-time, without ever seeing such a bird; and it seems therefore not improbable, that it arises from our not waiting for them at twilight or day-break, that they are never observed by Englishmen in the summer. If this bird should, however, be seen in the night, it is immediately supposed to be an owl, which a woodcock does not differ much from in its flight.

To these reasons for woodcocks not being observed, it may be added, that the bird is believed to be absolutely mute, and consequently, never discovers itself by its call.

If it be still contended, that the nest or young must sometimes be stumbled upon, though in the centre of extensive woods, or large bogs, the *fiskin* (or *aberdavine* *) is a much more extraordinary instance of concealing its nest and young.

The plumage of this bird is rather bright than otherwise; and the song, though not very pleasing, yet is very audible, both which circumstances should discover it at all times; yet Kramer † informs us, that, though immense numbers breed annually on

* Brit. Zool. p. 309.

† *Elenchus Animalium per Austriam*, p. 261. Viennæ, 1756.

the banks of the Danube, no one ever observed the nest.

This bird is rather uncommon in England ; so that if I ask when the nest was ever found within the verge of the island, it may be considered as rather an unfair challenge.

There is another bird, however, called a red-poll *, which is taken in numbers during the Michaelmas and March flights by the London bird-catchers, whose nest, I believe, was never discovered in England, though I have seen them in pairs during the summer, both in the mountainous parts of Wales and highlands of Scotland †.

But I shall now mention another proof that woodcocks breed in England.

The Reverend Mr. White, of Selborn, who is not only a well-read naturalist, but an active sportsman, informs me, that he hath frequently killed woodcocks in March, which, upon being opened, had the rudiments of eggs in them, and that it is usual at that time to flush them in pairs. Willughby also observes the same ‡.

This bird, therefore, certainly pairs before its supposed migration ; and can it be conceived that this strict union (which birds in a wild state so faithfully adhere to) ||, should take place before they

* Brit. Zool. p. 312.

† This elegant little bird is very common in Hudson's Bay, where it feeds chiefly on the birch trees ; which being more common in the northern than southern parts of Great Britain, may account for the bird's being more often seen northward.

‡ B. III. c. i.

|| It is believed that no mule-bird was ever seen in a wild state, notwithstanding M. de Buffon suspects many an intrigue

traverse

traverse oceans, and when they cannot as yet have pitched upon a proper place for concealing their nest and nestlings?

Let us examine if this intercourse before migration takes place in other birds, which are supposed to cross wide extents of sea : and a quail affords such proof.

I have been present when these birds have been caught in the spring, which always turn out to be males, and are enticed to the nets by the call of the hen ; quails therefore pair after they appear in England.

But I shall now consider the other two instances of birds which are seen with us in the winter, and are not observed in the summer ; I mean, the fieldfare and redwing.

And first, let us examine, where these birds are actually known to breed : the northern naturalists say, in Sweden ; Klein, in the neighbourhood of Dantzick, which is only in lat. $54^{\circ} 30' *$; and Willughby, in Bohemia.

in the recesses of the woods (Hist. Nat. des Oiseaux, tom. I.) such irregular intercourse is only observed in cages and aviaries, where birds are not only confined, but pampered with food.

* See Klein, de Avibus Erraticis, p. 178. Klein, however, cites Zornius, who lived in the same part of Germany, and who asserts that the *turdus iliacus* (or redwing) leaves those parts in the spring. The circumstance therefore of the redwing's breeding in numbers (*per multitudines*) had escaped the notice of Zornius, though he hath written a dissertation on this question.

Is it at all surprizing, after this, that such discoveries, if made at all, should not be commonly heard of ?

As they therefore build their nests in more Southern parts of Europe, there is certainly no natural impossibility of their doing so with us, though, I must own, I never yet heard but of one instance, which was a fieldfare's nest found near Paddington*.

I cannot, however, but think it is only from want of observation, that more of such nests have not been discovered, which are only looked after by very young children; and the chief object is the eggs, or nestlings, not the bird which lays them†.

The plumage therefore and flight of the fieldfare or redwing being neither of them very remarkable, it is not at all improbable they may remain in summer, without being attended to; and particularly the redwing, which scarcely differs at all in appearance from other thrushes. Thus the cough is by no means peculiar to Cornwall, as is commonly supposed, but is mistaken for the jackdaw, or rook.

But it may be said, that these birds fly in flocks during the winter, and if they remain here during the summer, we should see them equally congregate.

I have not before referred to Klein, who hath written a very able treatise, in which he argues against the possibility of migration in birds; because, though I should be very happy to support my poor opinion by his authority, yet I thought it right neither to repeat his facts, or arguments.

* See also Harl. Misc. Vol. II. p. 561.

† Many birds also build in places of such difficult access, that boys cannot climb to; birds nesting is confined almost entirely to hedges, and low shrubs.

This circumstance, however, is by no means peculiar to the fieldfare and redwing; most of the hard-billed singing birds do the same in winter, but separate in summer, as it is indeed necessary all birds should during the time of breeding.

I shall now consider another argument in favour of migration, which I do not know hath been ever insisted upon by those writers who have contended for it, and which at first appearance seems to carry great weight with it.

There are certain birds, which are supposed to visit this island only at distant intervals of years; the Bohemian chatterer and cross-bill * (for example) once perhaps in twenty.

The fact is not disputed, that such birds are not commonly observed in particular spots from year to year; but this may arise from two causes, either a partial migration within the verge of our island, or perhaps more frequently from want of a ready knowledge of birds on the wing, when they happen to be seen indeed, but cannot be examined.

I never have disputed such a partial migration; and indeed I have received a most irrefragable proof of such a flitting, from the Rev. Mr. White of Selborn in Hampshire, whose accurate observations I have before had occasion to argue from.

* This bird changes the colour of its plumage at different seasons of the year, which is sometimes red.

The first account we have of their being seen, is in the Ph. Tr. abr. Vol. V. p. 33. where Mr. Edward Lhwyd suspects them to be Virginia nightingales, from their feathers being red, and had no difficulty of at once supposing that they had crossed the Atlantic.

The rock (or ring-ouzel) hath always hitherto been considered as frequenting only the more mountainous parts of this island : Mr. White, however, informs me that there is a regular migration of these birds, which flock in numbers, and regularly visit the neighbourhood of Selborn, in Hampshire*.

I therefore have little doubt but that they equally appear in others of our Southern counties ; though it escapes common observation, as they bear a sort of general resemblance to the black-bird, at least to the hen of that species.

I own also, that I always conceived the Bohemian chatterer was not observed in Great Britain but at very distant intervals of years, and then perhaps only a single bird, whereas Dr. Ramsay (professor of natural history at Edinburgh) informs Mr. Pennant, that flocks of these birds appear constantly every year in the neighbourhood of that city †.

As for cross-bills, they are seen more and more in different parts of England, since there have been so many plantations of firs : this bird is remarkably fond of the seeds of these trees, and therefore changes its place to those parts where it can procure the greatest plenty of such food ‡.

* See also Br. Zool. Ill. p. 56.

† These birds are said to be particularly fond of the berries of the mountain-ash, which is an uncommon tree in the Southern parts of Great Britain, but by no means so in the North.

‡ This bird should also, for the same reason, be found from year to year in the cyder counties, if it was true (as is commonly supposed) that he is particularly fond of the kernels of

This flitting therefore by no means amounts to a total and periodical migration over seas, but is no more than what is experienced with regard to several birds.

For example, the British Zoology informs us *, that, at an average, 4000 dozen of larks are sent up from the neighbourhood of Dunstable, to supply the London markets ; nor do I hear, upon inquiry, that there is any complaint of the numbers decreasing from year to year, notwithstanding this great consumption.

I should not suppose that 50 dozen of skylarks are caught in any other county of England ; and it should therefore seem that the larks from the more adjacent parts crowd in to supply the vacuum occasioned by the London Epicures, which may be the cause possibly of a partial migration throughout the whole island.

I begin now to approach to something like a conclusion of this (I fear) tedious dissertation : I think, however, that I should not omit what appears to me at least as a demonstration, that one bird, which is commonly supposed to migrate across seas, cannot possibly do so.

apples, which it is conceived he can instantly extract with his very singular bill.

Mr. Tunstall, F. R. S. however, at my desire, once placed an apple in the cage of a cross-bill, which he had kept for some time in his very valuable and capital collection of live birds : upon examining the apple a fortnight afterwards, it remained untouched.

* P. 235.

A landrail *, when put up by the shooter, never flies 100 yards; its motion is excessively slow, whilst the legs hang down like those of the water fowls which have not web feet, and which are known never to take longer flights.

This bird is not very common with us in England, but is excessively so in Ireland, where they are called corn-creaks.

Now those who contend that the landrail, because it happens to disappear in winter, must migrate across oceans, are reduced to the following dilemma.

They must first either suppose that it reaches Ireland periodically from America; which is impossible, not only because the passage of the Atlantic includes so many degrees of longitude, but because there is no such bird in that part of the globe.

If the landrail therefore migrates from the continent of Europe to Ireland, which it must otherwise do, the necessary consequence is, that many must pass over England in their way Westward to Ireland; and why do not more of these birds continue with us, but, on the contrary, immediately proceed across the St. George's channel?

Whence should it arise also, if they pass over this island periodically in the spring and autumn, that they are never observed in such passage, as I have already stated their rate in flying to be excessively slow; to which I may add, that I never saw them rise to the height of twenty yards from the ground, nor indeed exceed the pitch of a quail.

* Br. Zool. p. 387,

I have now submitted the best answers that have occurred, not only to the general arguments for the migration of birds across oceans, but also to the particular facts, which are relied upon as actual proofs of such a regular and periodical passage.

Though I may be possibly mistaken in many of the conjectures I have made, yet I think I cannot be confuted but by new facts, and to such fresh evidence, properly authenticated, I shall most readily give up every point, which I have from present conviction been contending for.

I may then perhaps also flatter myself, that the having expressed my doubts with regard to the proofs hitherto relied upon, in support of migration, may have contributed to such new, and more accurate observations.

It is to be wished, however, that these more convincing and decisive facts may be received from islanders (the more distant from any land the better*) and not from the inhabitants of a continent; as it does not seem to be a fair inference, because certain birds leave certain spots at particular times, that they therefore migrate across a wide extent of sea.

For example, storks disappear in Holland during the winter, and they have not a very wide tract of sea between them and England; yet this bird never frequents our coasts.

* I would particularly propose the islands of Madera and St. Helena; to these, I would also add the island of Ascension (had it any inhabitants), as likewise Juan Fernandez, for the Pacifick ocean.

The stork, however, may be truly considered as a bird of passage, by the inhabitants of those parts of Europe (wherever situated) to which it may be supposed to resort during the winter, and where it is not seen during the summer.

I am, dear Sir,

Your most faithful,

humble servant,

Daines Barrington.

P. S.

SINCE I sent to you my very long letter on the migration of birds, I have had an opportunity of examining the "Planches Enluminées," which are said to be published under M. de Buffon's inspection, and which seem to afford a demonstration of M. Adanson's inaccuracy in supposing either the roller, or swallows, which he caught in his ship, near the coast of Senegal, to be the same with those of Europe.

In the 8th of these plates, there is a coloured figure of a bird, called le rolhier d'Angola, which agrees exactly with M. Adanson's description *; but he trusted too much to his memory, when he pronounced it to be the same with the *Garrulus Argentoratenfis* of Willughby, and therefore supposed it to be on its passage to Europe.

This bird hath, indeed, in many respects, a very strong resemblance to the common roller of Europe, which is represented also in the *Planches Enluminées*, plate 486; but it differs most materially in the length of the two exterior feathers of the tail, as well as in the colour of the neck, which in the African roller is of a most bright green, and in the European of rather a dull blue.

In the 310th plate, there is likewise a coloured representation of the "Hirondelle a ventre roux du Senegal," which specimen was possibly furnished by Monsr. Adanson himself.

* Voyage au Senegal, p. 15. There is also another African bird, represented in the "Planches Enluminées," which might very easily, on a hasty inspection, be mistaken for the *Garrulus Argentoratenfis*, viz. the Guepier a longue queue du Senegal. Pl. Enl. p. 314.

The roller of Angola is also engraved by Brisson, T. ii. pl. 7.

It very much resembles the European swallow, but the tail differs, as the forks (in the Senegal specimen) taper from the top of the two exterior feathers to the bottom, at three regular divisions, whereas in the European they are nearly of the same width throughout.

The convincing proof, however, that the “*Hirundo a ventre roux du Senegal*” differs from our chimney swallow is, that the rump is entirely covered with a bright orange or chestnut, which in the European swallow “is of a very lovely but dark purplish blue colour *.”

Having lately looked into Aristotle’s Natural History, with regard to the cuckow, I take this opportunity also of enlarging on the doubts I have thrown out, in relation to the prevailing notion of this bird’s nestlings being hatched and fed by foster parents.

I find that this most general opinion takes its rise from what is said by this father of natural history, in his ninth book, and twenty-ninth chapter.

Aristotle there asserts, that the cuckow does not build a nest itself, but makes use most commonly of those of the wood-pigeon, hedge-sparrow, lark, (which he adds are on the ground) as well as that of the *χλωρίς* †, which is in trees.

Now, if we take the whole of this account together, it is certainly not to be depended upon; for the wood-pigeon ‡ and hedge-sparrow do not build upon the ground, and no one ever pretended to have

* See Willughby, p. 312.

† The *χλωρίς* is rendered *luteola*; but, as there is no description, it is difficult to say what bird Aristotle here alludes to; Zinanni supposes it to be the greenfinch.

‡ The wood-pigeon, from its size, seems to be the only bird which is capable of hatching, or feeding, the young cuckow found

found a cuckow's egg in the nest of a lark, which, indeed, is so placed.

I have before observed, that the witnesses often vary with regard to the bird in which the cuckow's egg is deposited *; and Aristotle himself, in the seventh chapter of his sixth book, confines the foster-parents to the wood-pigeon and hedge-sparrow, but chiefly the former.

If the age † of Aristotle is considered, when he began to collect the materials for his Natural History, by the encouragement of Alexander after his conquests in India ‡, it is highly improbable he should have written from his own observations. He therefore seems to have hastily put down the accounts of the persons who brought him the different specimens from most parts of the then known world.

Inaccurate, however, and contradictory as these reports often turn out, it was the best compilation which the ancients could have recourse to; and Pliny kow; yet, if it is recollected that this bird lives on seeds, it is probable that the cuckow, whose nourishment is insects, would either be soon starved, or incapable of digesting what was brought by the foster-parent. This objection is equally applicable to the *χλωρίς*, if it is our greenfinch.

* Thus Linnæus supposes it (in the *Fauna Suecica*) to be the white wagtail, which bird builds in the banks of rivers, or roofs of houses, (See Zinanni, p. 51.) where it is believed no young cuckow was ever found.

† He did not leave the school of Plato till the age of thirty-eight (or, as some say, forty); after which, some years passed before he became Alexander's preceptor, who was then but fourteen: nor could he have written his Natural History, probably, till twelve years after this, as Pliny states that specimens were sent to him by Alexander, from his conquests in India. Aristotle therefore must have been nearly sixty, when he began this great work, and consequently must have described from the observations of others.

‡ Pliny, L. viii. c. 16.

therefore professes only to abridge him, in which he often does not do justice to the original.

Whatever was asserted by Aristotle, is well known to have been most implicitly believed, till the last century ; and I am convinced that many of the learned in Europe would, before that time, not have credited their own eyesight against what he had delivered.

There cannot be a stronger proof that the general notion about the cuckow arises from what is laid down by Aristotle, than the chapter which immediately follows, as it relates to the goatsucker, and states that this bird sucks the teats of that animal.

From this circumstance, the goatsucker hath obtained a similar name in most languages, though it is believed no one (who thinks at all about matters of this sort) continues to believe that this bird sucks the goat *, any more than the hedgehog does the cow.

I beg leave, however, to explain myself, that I give these additional reasons only for my doubting with regard to this most prevailing opinion ; because I am truly sensible that many things happen in nature, which contradict all arguments from analogy, and I am persuaded, therefore, that the first person who gave an account of the flying fish, was not credited by any one, though the existence of this animal is not now to be disputed.

All that I mean to contend for is, that the instances of such extraordinary peculiarities in animals, should be proportionably well attested, in all the necessary circumstances.

I must own, for example, that nothing short of the following particulars will thoroughly satisfy me on this head.

* See Zinanni p. 95. who took great pains to detect this vulgar error.

The hedge-sparrow's nest must be found with the proper eggs in it, which should be destroyed by the cuckow, at the time she introduces her single egg*.

The nest should then be examined at a proper distance from day to day, during the hedge-sparrow's incubation, as also the motions of the foster parent attended to, particularly in feeding the young cuckow, till it is able to shift for itself.

As I have little doubt that the last mentioned circumstance will appear decisive to many, without the others which I have required, it may be proper to give my reasons, why I cannot consider it alone, as sufficient.

There is something in the cry of a nestling for food, which affects all kinds of birds, almost as much as that of an infant, for the same purpose, excites the compassion of every human hearer†.

I have taken four young ones from a hen skylark, and placed in their room five nestling nightingales, as well as five wrens, the greater part of which were reared by the foster parent.

It can hardly in this experiment be contended, that the skylark mistook them for her own nestlings, be-

* I could also wish that the following experiment was tried. When a hedge-sparrow hath laid all her eggs, a single one of any other bird, as large as a cuckow, might be introduced, after which if either the nest was deserted, or the egg too large to be hatched, it would afford a strong presumption against this prevailing opinion. I must here also take notice, that Mr. Hunter, F. R. S. who hath dissected hen cuckows, informs me that they are not incapacitated from hatching their eggs, as hath been supposed by some ornithologists.

† I am persuaded that a cuckow is oftener an orphan, than any other nestling, because, from the curiosity which prevails with regard to this bird, the parents are eternally shot.

cause they differed greatly, not only in number and size, but in their habits, for nightingales and wrens perch, which a skylark is almost incapable of, though, by great assiduity, she at last taught herself the proper equilibrium of the body.

I have likewise been witness of the following experiment: two robins hatched five young ones in a breeding cage, to which five others were added, and the old birds brought up the whole number, making no distinction between them.

The *Aëdologie* also mentions (which is a very sensible treatise on the nightingale*) that nestlings of all sorts may be reared in the same manner, by introducing them to a caged bird, which is supplied with the proper food.

Not only old birds, however, attend to this cry of distress from nestlings, but young ones also which are able to shift for themselves.

I have seen a chicken, not above two months old, take as much care of younger chickens, as the parent would have shewn to them which they had lost, not only by scratching to procure them food, but by covering them with her wings; and I have little doubt but that she would have done the same by young ducks.

I have likewise been witness of nestling thrushes of a later brood, being fed by a young bird which was hatched earlier, and which indeed rather over-crammed the orphans intrusted to her care; if the bird however erred in judgement, she was certainly not deficient in tenderness, which I am persuaded she would have equally extended to a nestling cuckow.

* Paris, 1751, or 1771.