



BARNACLE GEESE

Myth: For hundreds of years, barnacle geese were thought to hatch out from goose barnacles.

Busted: We now know they arrive in winter from Greenland or Svalbard.

MIGRATION

MYTHS AND MYSTERIES

For thousands of years, people have seen strange birds appear and vanish with the seasons – drawing some ‘cuckoo’ conclusions about them. The RSPB’s **Dr Guy Anderson** reveals some early ornithological mysteries, and how data-gathering helped solve them.

White storks arriving in Europe with embedded African weaponry gave ornithologists the first clue that birds could migrate long distances.

Below: An 1839 impression of ancient Greek philosopher and naturalist, Aristotle.



Flagging down a ride? In the Americas, hummingbirds weren't thought capable of flying long distances by themselves.

BIRD HIBERNATION?

While swallows don't sleep out the winter in ponds after all, Aristotle was not entirely wrong about bird hibernation. There is one bird known to shut down its metabolism and 'hibernate' for extended periods – the common poorwill, a member of the nightjar family from North and Central America. A few other birds can also shut down their metabolism for shorter periods of a few hours or days – including some swifts and hummingbirds, which are quite closely related. Maybe other examples of hibernation in birds await discovery, too?

Aristotle was a phenomenal documenter of the natural world. He observed and recorded the plants, animals and changing seasons he saw around his Greek homeland some 2,300 years ago. The 'Father of Biology' explained his observations with incredible intelligence, logic and accuracy, way ahead of his time. But one natural phenomenon he could not fully explain, was why – every year – many different types of birds appeared in Greece in spring, and then disappeared again in autumn... while other types appeared in autumn and then disappeared again in spring! What on earth was going on?

Being a clever chap, Aristotle came up with some theories, based on the solid foundations of observation, logic and reason. Plenty of mammals, reptiles, amphibians and insects hibernate over winter. They shut down their metabolism to save energy and effectively sleep through the hard times. So birds probably do the same, right? Makes sense.

Aristotle firmly believed that some birds hibernated to see out the European winter, and this idea persisted for at least 2,000 years. Even as late as 1878, the eminent American ornithologist Dr Elliot Coues was able to cite 182 scientific papers dealing with the hibernation of swallows. There seemed to be much logic in this – like amphibians and fish, birds probably slept in the bottom of lakes and ponds. Where is the last place you see swallows and martins in autumn

MYTH BUSTERS

CRANE WARRIORS

Myth: In Greek mythology, cranes flew to the world's end and went into battle against armies of goat-riding men.

Busted: The truth is, common cranes fly to Spain and Africa, no battles required.

before they vanish for the winter? Very often over ponds and lakes, and often diving into reeds at dusk in large numbers. The next morning, there is no sign of them. All safely snoozing underwater. Logical.

But, Mr Aristotle, what do you make of the observation that some birds only appear during the winter? They are clearly not hibernating. OK, maybe something more bizarre is going on. Maybe birds don't actually appear or disappear, they just change their appearance between seasons. What look like different birds are actually the same creature. The 'redstart' that summers in southern Europe becomes the 'robin' that winters there. The flycatcher becomes the finch, the garganey becomes the wigeon, you get the idea. Aristotle proposed this 'transmutation' theory, which, again, has some logic. Birds do change their appearance between seasons after all; some have very different summer breeding and winter plumages. See the seasonally flamboyant example of the male ruff.

The barnacle goose is named from a similar concept. Barnacle geese that appeared on European shores in winter were thought to turn into the marine 'goose barnacles' in summer, when all the birds vanished out to sea.

ARROW FROM AFRICA

Right, that's the vanishing birds thing sorted. No more philosophising required from our classical-era thought leaders. What do you mean they might fly south instead? Don't be silly, birds that weigh no more than a

"In the New World, hummingbirds were believed to ride on the backs of geese."

few drachmas can't possibly fly across the vast expanses of Mediterranean Sea and Saharan Desert twice a year. You must be mad if you think that.

And these views prevailed for over 2,000 years, until the first real hard evidence emerged that birds might actually move very large distances indeed. This evidence was not always gained intentionally, and was not always good news for the birds involved. The tale of the Mecklenburg *Pfeilstörch* ('arrow-stork') is a good example. In May 1822, a bird hunter in the Mecklenburg-Vorpommern region of northern Germany shot and killed a white stork, which had recently returned to its nesting area from nobody-knew-where. Like they did every year. But on collecting their quarry, the hunter noticed something very strange about this bird. There appeared to be a long stick protruding from the bird's neck. The hunter took the bird and stick to the local museum, where they identified the stick as being a spear or arrow, of a type known to be used by hunters in central Africa. Yes, Africa.

So the unfortunate stork had narrowly avoided becoming dinner while on its wintering grounds

SWALLOWS IN THE MUD

Myth: A belief persisted for centuries that swallows and sand martins slept through winter buried in the mud at the bottom of ponds.

Busted: Despite their suspicious proximity to pond water, the birds were feeding up on insects above the surface, and also seen roosting in reed beds on their journey south.

somewhere like modern-day Chad, had survived the arrow being lodged in its neck, and then had carried that arrow all the way back on its spring journey back to Germany, only to get shot on arrival.

The unfortunate bird (pictured above, left) is preserved and on display at the University of Rostock Museum. But the significance of this story is clear; it's one of the very first pieces of hard evidence that birds regularly travel between continents. Incredibly, there are reports of around 25 *Pfeilstörche* – all unlucky white storks carrying assorted bits of African weaponry with them to Europe.

HITCHING A RIDE?

Even when people started to accept that large birds like storks might actually be capable of travelling long distances each year, there was still ongoing resistance to the idea that small birds could do the same. Maybe the small birds hitched a ride on the back of larger cousins? The diminutive goldcrest – surely not capable of long journeys on its own – was known as the 'woodcock pilot' and thought to guide its larger wader cousin while sitting on its back. A similar myth arose in the New World, where hummingbirds were believed to ride on the backs of geese.

The real game-changer for our understanding of bird migration, as we now know it, was the development of bird ringing. From the very end of the 19th century, ornithologists developed safe ways of attaching small metal bands or rings to birds' legs. Each ring bears a

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Being able to track individual birds around the globe by bird ringing, and later also by higher-tech satellite tagging (as with this turtle dove), is key to understanding the movements of migratory birds so we can help them.



Photo: Andy Hay (rspb-images.com)

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code number, unique to that individual bird. Ringing birds in one place, and then finding them somewhere else, revealed most of what we knew about bird migration as the end of the 20th century approached. Birds ringed in the UK turned up in the most astonishing places. In 1912, a UK-ringed swallow was found wintering in South Africa. South Africa! And this bird was no exception either, many of 'our' swallows have turned up in far southern Africa. So, what was that about hibernating in ponds, again?

UK-ringed Manx shearwaters turned up off the coast of Brazil and Argentina. UK-ringed Arctic terns were found off Antarctica and in Australia. Wildfowl and waders that spend the winter with us were found on their high Arctic breeding grounds in Canada, Greenland and Russia. It quickly became clear that not only did lots of birds migrate to and from Europe, but that these seasonal waves of birds ebbed and flowed all around the globe, and that nearly half the world's bird species are migratory to some extent.

These avian tides are focused along eight major flyways around the world, and the UK is on one of them – the East Atlantic Flyway. This is a bird superhighway, millions of birds travelling along it, there and back, every year. And like all major travel routes, it has service stations – places to rest and refuel on the way. For migrating birds, these are often biodiversity-rich habitats – particularly freshwater and coastal wetlands.

ROADSIDE ASSISTANCE ON THE FLYWAY

It is no coincidence that many of our best pit stops are RSPB nature reserves. But if we going to protect migratory birds for the future, we have to think on their scale – the flyway scale. There's no point in just creating lovely service stations for migrant birds here in the UK, if they're having difficulties elsewhere on their annual travels. This is why it is so important for RSPB to work with our conservation partners (particularly through the BirdLife International family) all along the East Atlantic Flyway, from the Arctic to South Africa.

Migratory birds are truly Birds Without Borders, and our conservation approaches have to be on a similar scale. International partnership working like this makes it even more important that we base our strategy for the conservation of migratory birds on good evidence. It's hard to convince others to take action if there is little sound evidence behind what you are advocating. Working in partnership to get that evidence is even better.

Our work with turtle doves is a great example; we led the production of an international conservation action plan for turtle doves, which brought together all the available science and evidence and so was able to identify key actions that were needed on a continental scale to stand any chance of reversing the doves' catastrophic decline. Breeding habitats needed to be restored to allow doves to breed successfully, and unsustainable levels of hunting on the flyway needed to be stopped. Not either or, but both. Simultaneously.

This action plan is working; 2022 was the first year when no hunting of turtle doves was permitted in France, Spain or Portugal (countries through which all UK-breeding doves migrate). We also continued to

FLY ME TO THE MOON

Myth: In the 1700s, scientist Charles Morton estimated that when birds disappeared, they headed to the moon, a journey of 60 days.

Busted: No birds have yet left our stratosphere, but an Arctic tern can tot up the equivalent mileage to the moon many times over in its lifetime.

ROBINS AND REDSTARTS

Myth: One of Aristotle's theories was that birds turned into other species for winter, with redstarts turning into robins.

Busted: In Greece, robins do arrive in winter when redstarts depart for Africa, but we now know their movements. Many UK robins are year-round residents, but others fly south in winter.

increase our breeding habitat restoration efforts through Operation Turtle Dove, working with an ever-growing number of farmers, land managers and communities. Both sides of the conservation story for this long-distance migratory bird, both driven by good evidence, are working together.

For other migrants, we are still at the early stages of evidence gathering – the simple questions of 'where do they go?' Without this basic understanding – as Aristotle showed us – it is hard to come to the right conclusions as to what drives the fortunes of birds. If you don't know where they go, it is hard to understand what problems they might face there, making it hard to come up with sensible conservation strategies.

So, Aristotle did not know everything about birds and their migrations, and we still don't to this day. But his fundamental principles of logic, reason and observation are as sound now as they were 2,000 years ago. Add to that the magic ingredient of evidence, and modern-day conservation thinkers can get on the right track – mental flyway if you will – to securing a better future for our astonishing migratory birds. Aristotle did know that "In all things of nature there is something of the marvellous." No more so than for bird migration. ■



As UK Migrants Recovery Programme Manager, with the RSPB's Global Species Recovery Team, Guy spends his days thinking how best to save migratory birds. He wishes he could think like Aristotle, but at least he has now come to terms with the fact that swallows don't hibernate.



CROSSING THE SEA

To migrating birds that can't swim very well (quite a lot of them), large water bodies like the Mediterranean pose a significant challenge. Surprisingly this challenge is greatest for both the smallest and largest birds. The smallest for metabolic reasons – they can only store enough energy for a limited flight time before they have to stop and refuel. But long water crossings are even more problematic for large birds that rely on soaring flight, and thermals to give them altitude.

Thermals don't usually form over water, so birds have to rely on lots of flapping instead. This is exhausting for large-winged soaring birds like storks and large raptors, and why their migration routes are so tightly concentrated on the shortest water crossings available – places like the Straits of Gibraltar, the Bosphorus and Dardanelles in Turkey. This is also why we get so few vagrant large raptors and storks turning up in the UK – the English Channel is a major barrier for them.