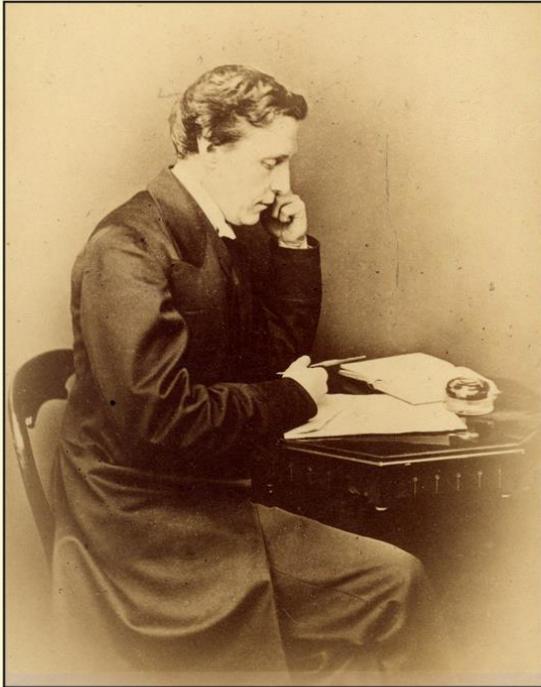
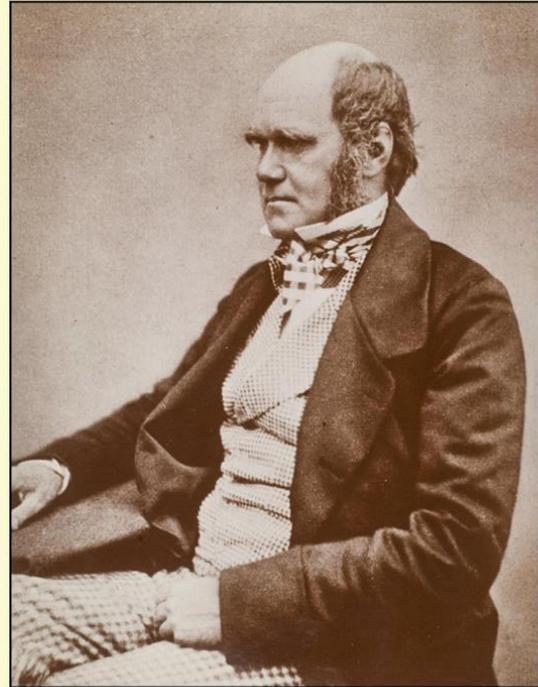


**This is the rough script for the talk given by Mark Richards at the  
Lewis Carroll: Man of Science event in 2011 at the LSE**



**Charles Dodgson, 1832 - 1898**



**Charles Darwin, 1809 - 1882**

In the programme my talk is called “Dodgson and Darwin”. But as the White Knight might say ... that is not the title of the talk, that is just what it is called.

The real title, is too long to fit on the programme ... and is:

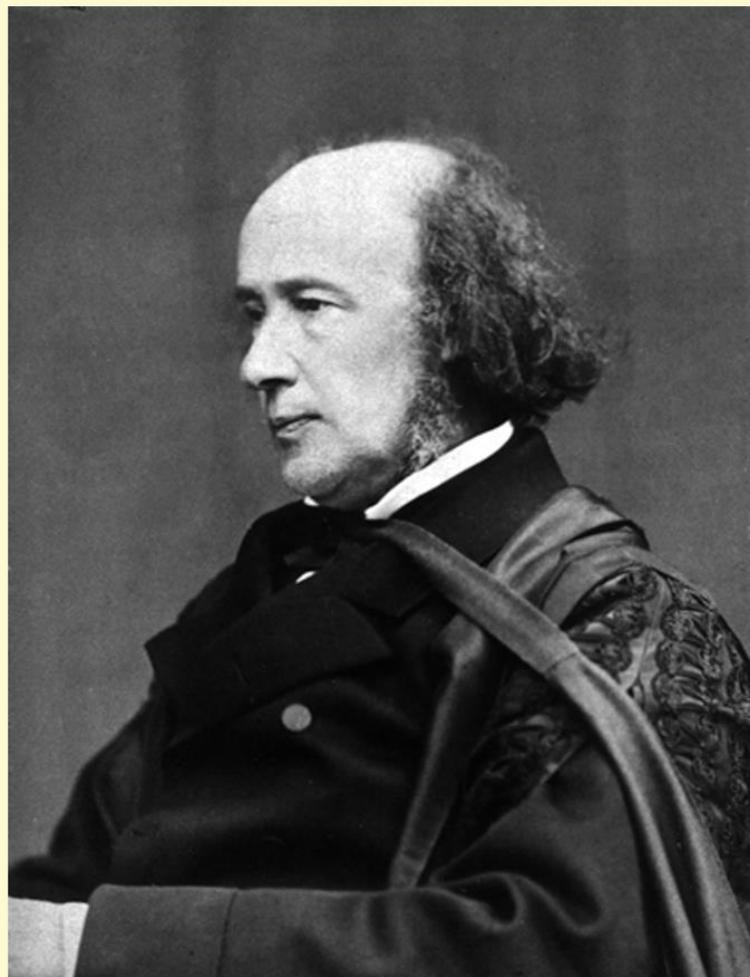
Distinguishing those that have feathers, and bite  
From those that have whiskers, and Scratch.

Which is taken, of course, from Dodgson’s *The Hunting of the Snark*, of 1876. It is a phrase which brings to mind the Victorian passion for categorising species and cataloguing the natural world. Something which was very much a part of the foundations for the development of the Natural Sciences at Oxford.

I **shall** be talking about the connections between Darwin and Dodgson, but in the wider context of the development of the growth of scientific study at a University more traditionally founded on classics, history and philosophy.

Until the mid 19<sup>th</sup> century the Natural Sciences had not been regarded as appropriate areas of study for Oxford undergraduates, yet these subjects were seeing huge advances around the world. There were calls for the University to review its attitude to these developing disciplines and to provide better facilities.

**Henry Acland**  
1815 - 1900



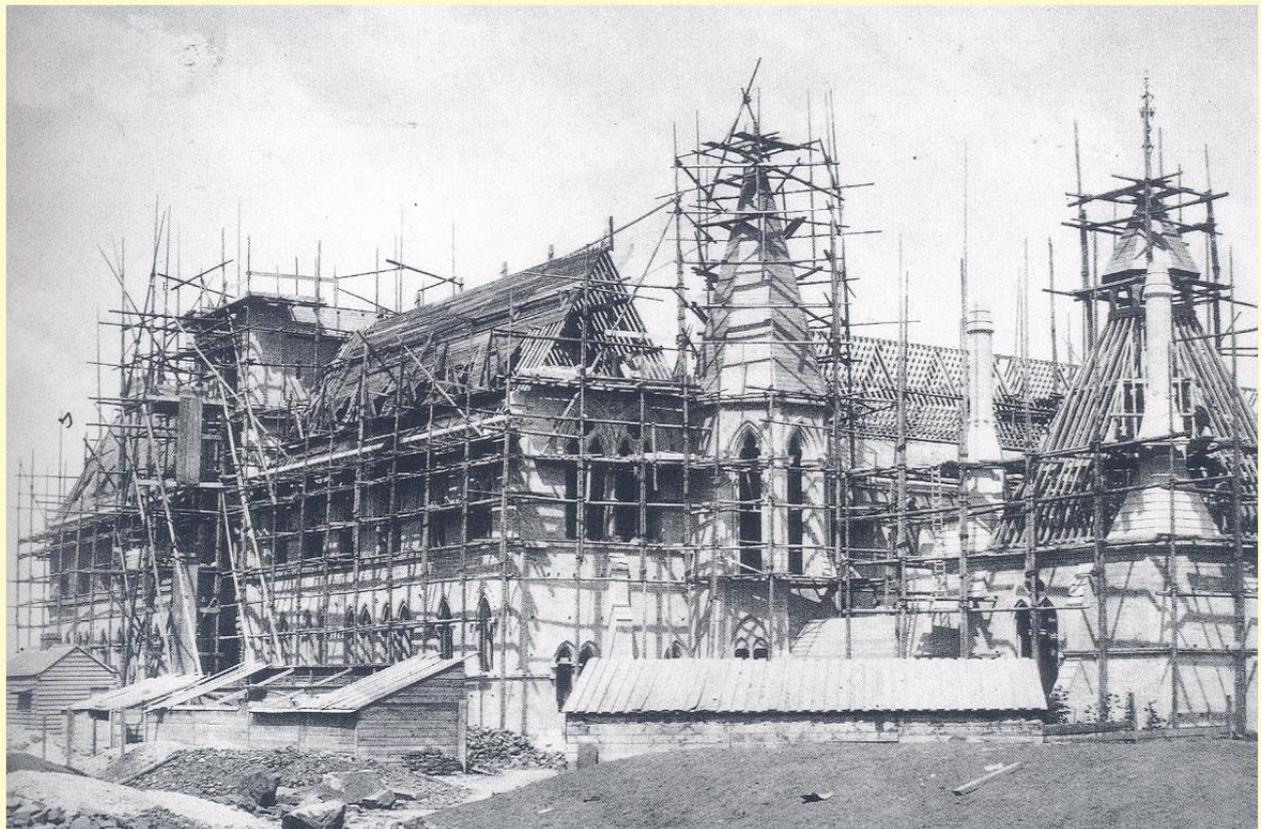
One of the main campaigners for change was Henry Acland. Acland was educated at Harrow and Christ Church. He studied medicine at Edinburgh and London and returned to Christ Church in 1845 taking the post of Lee's Reader in Anatomy and later becoming Regius Professor of Medicine.

Acland collected anatomical specimens and other material to assist in the teaching of anatomy and medicine. His lectures often included demonstrations and he was a pioneer, at Oxford, in teaching methods which are commonplace today although often met with opposition at the time.

Acland and others believed that teaching required the use of laboratories and the study of specimens and whilst some of these facilities did exist at Oxford, they were scant and disorganised. The establishment of a new Museum dedicated to the study of Natural History and Physical Sciences would help to bring about a significant change in Oxford's reputation as a centre for scientific study.

In 1848 Acland wrote:

“With respect to the proposal to add some study of the fundamental arrangements of the natural world to the general education of the place, I fear that if we do not *add* it, we may live to see, what would be a great national evil, such knowledge *substituted* for our present system”



The University Museum Committee was formed and it was their memorandum of 1850 which led to the creation of the Oxford Museum, with the founding stone being laid later that year.



During the second half of the 1850s, various collections were moved into the new museum, departments gradually established themselves in their new premises and the official opening took place in 1860.

This we know today at the Oxford University Museum of Natural History.

In 1859 Acland, with reference to his 1848 plea, was able to write “The *Addition* has been made; the *substitution* is, I hope, averted.” But we’ll see about that later.

Christ Church, had its own collection of anatomical specimens which were to be transferred to the Museum, in the Summer of 1857. Acland saw the need and the opportunity to make a photographic record of the collection and he knew a man who could perform such a task.

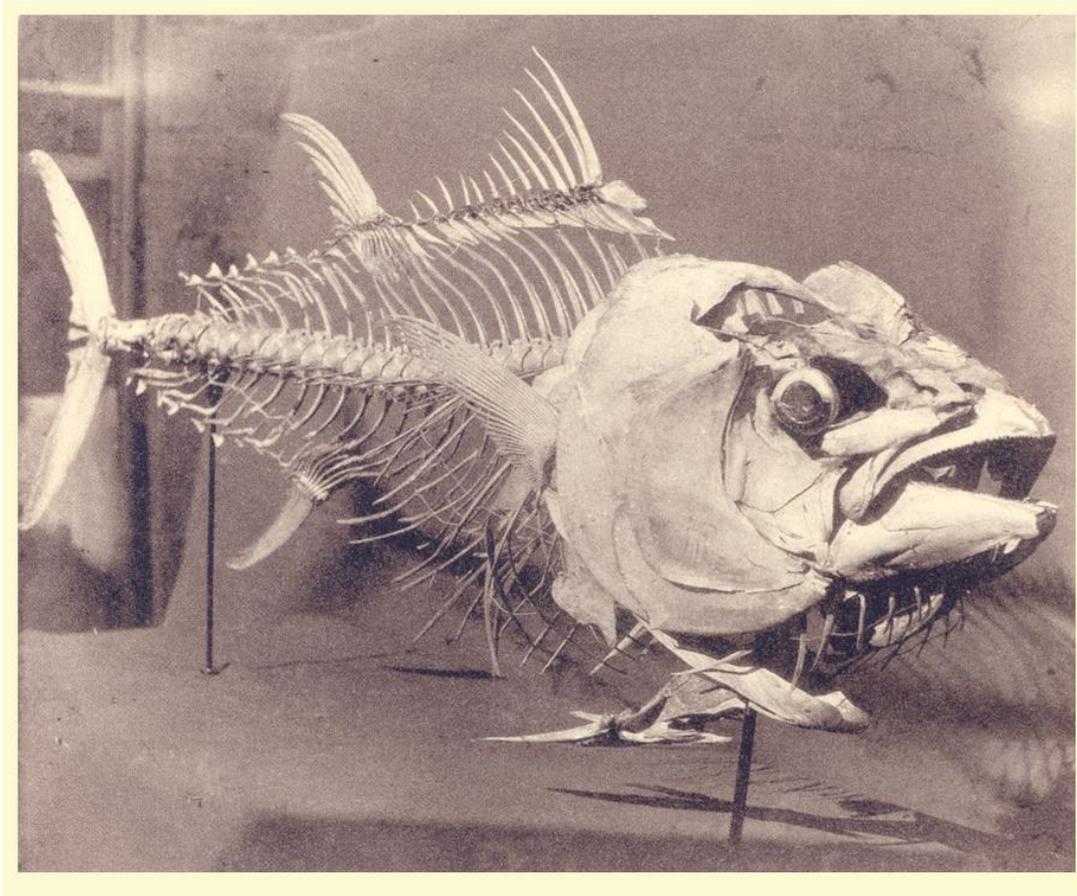


**Charles Dodgson, with camera lens**

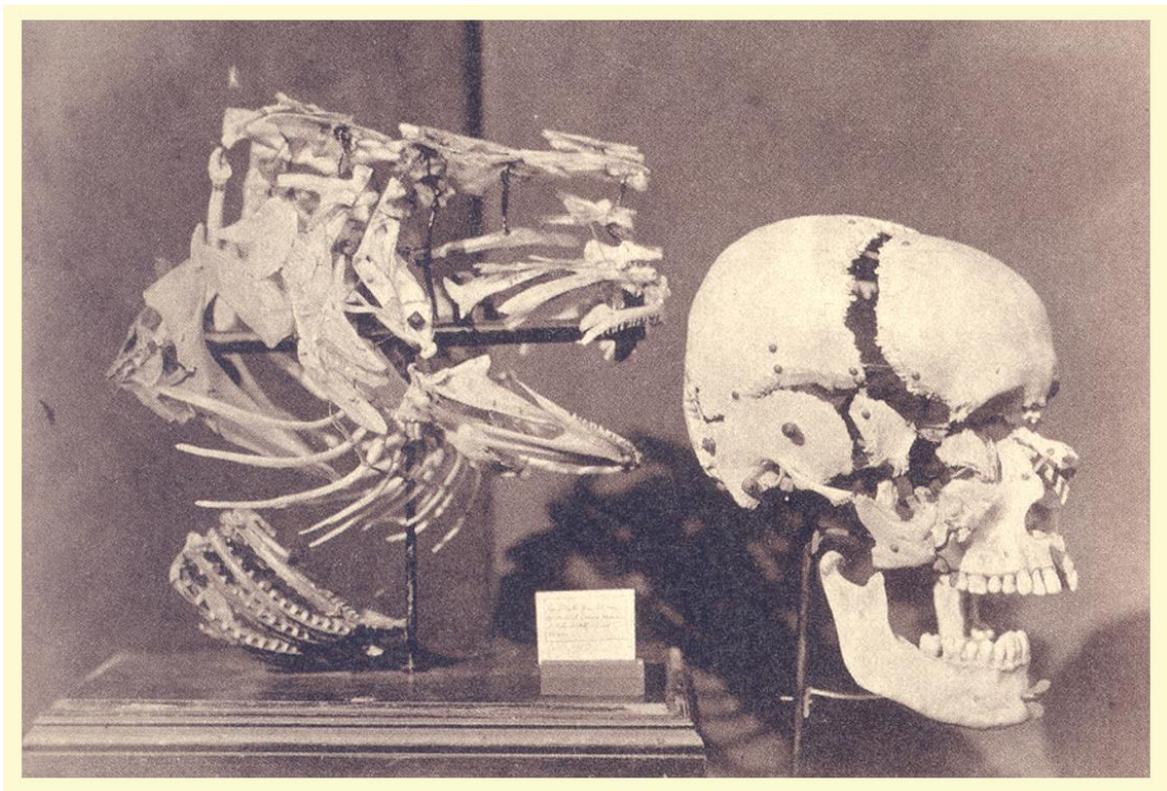
It would be almost a decade later that Lewis Carroll would become a household name, but Charles Dodgson was already making progress in another area which was later to give him some notoriety – that was, of course, photography. Dodgson took up the hobby in 1856 at a time when the subject was still in its infancy.



Photographing the Christ Church Anatomical Collection was an early commission for him. It was a useful opportunity to practice the art at Christ Church's expense and a chance to become involved, in a small way, in the establishment of the new museum.



In amongst the fascinating images which Dodgson created at that time we have *this* little curiosity.

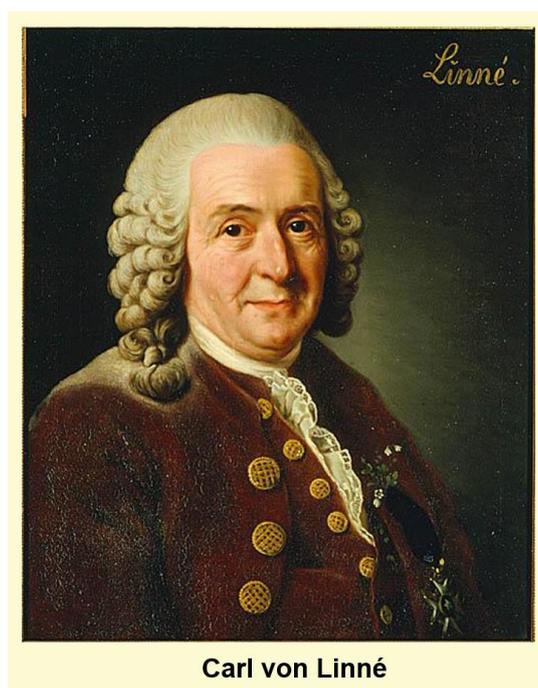


This is the skull of a human being together with the head of a cod fish. It might be regarded as one of the earliest photographs in the field of comparative anatomy. I doubt if Dodgson is really attempting to make a significant scientific point here, but this, more famous photograph, taken around the same time is worthy of a little more analysis.



Here we have Dodgson's friend Reginald Southey standing next to a human skeleton. On a plinth is the skeleton of a monkey and slightly lower we have the carefully aligned skulls of a gorilla and a human. There appear to be strong and obvious references to evolution in this image. By observing the shadows and the very deliberate profile view of all the components, we can see that the living human and the skeleton are facing away from the sun giving the hint that mankind is looking to the future whilst the monkey looks back at the past. Southey's arm resting on the human skeleton's shoulder and the monkey's hand almost shaking the hand of the human skeleton suggest what one writer describes as an "evolutionary affinity". The gorilla's skull placed next to the human skull hints very strongly at a progression from one to the other and perhaps onto to something else as they lead out of the image to the right. Although this image pre-dates the publication of Darwin's most famous work by nearly two years, evolutionary debate was very much in the air at the time.

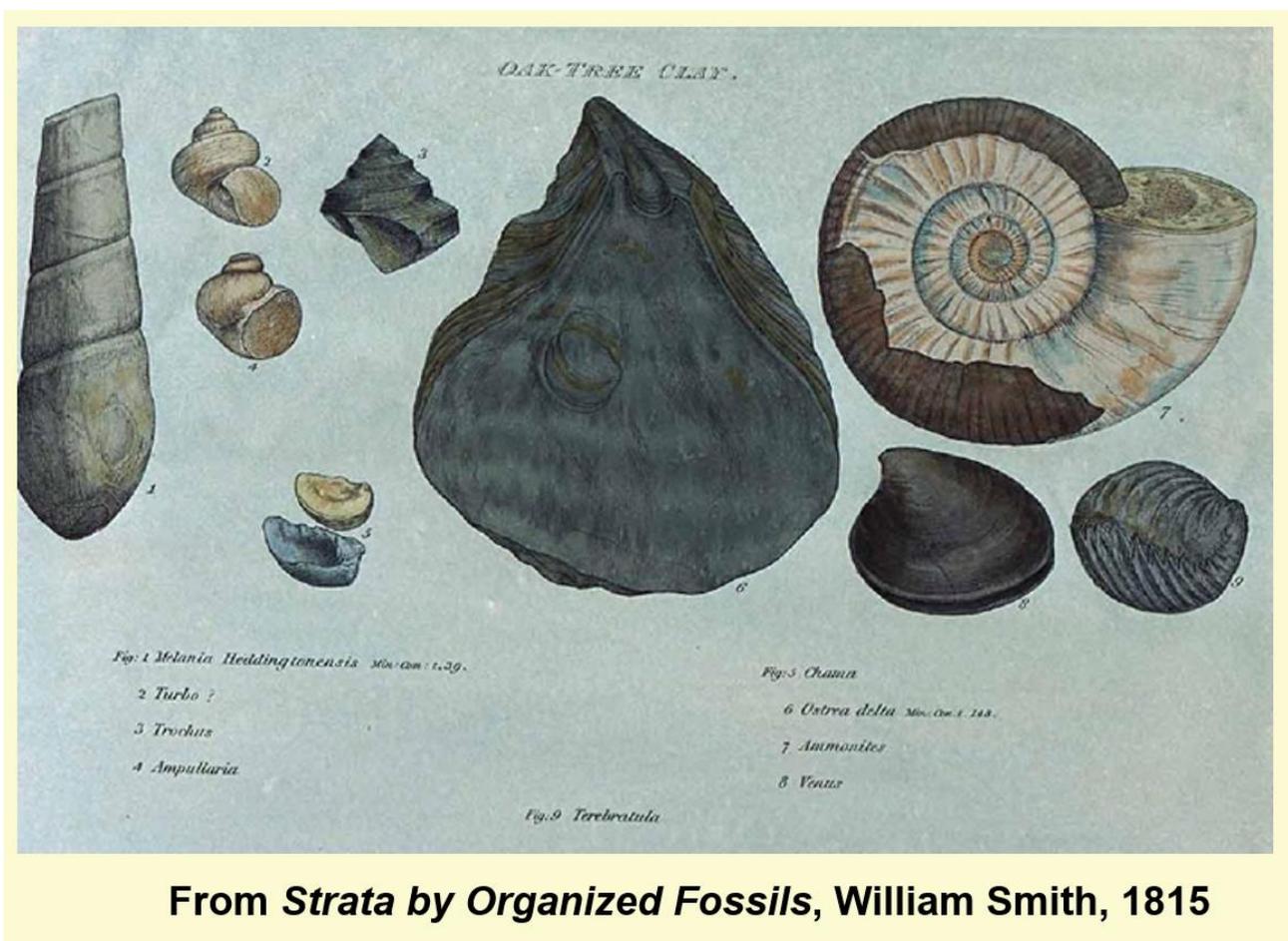
Theories on evolution can be traced back to the 5<sup>th</sup> century BC. But idea of the Fixity of Species was very much the accepted view at the start of the 19<sup>th</sup> century. It was generally believed that the earth had been created comparatively recently (less than 4000 years before Christ) and that all species of living things had been created at the same time and had persisted unchanged or unchangeable ever since.



Carl von Linné

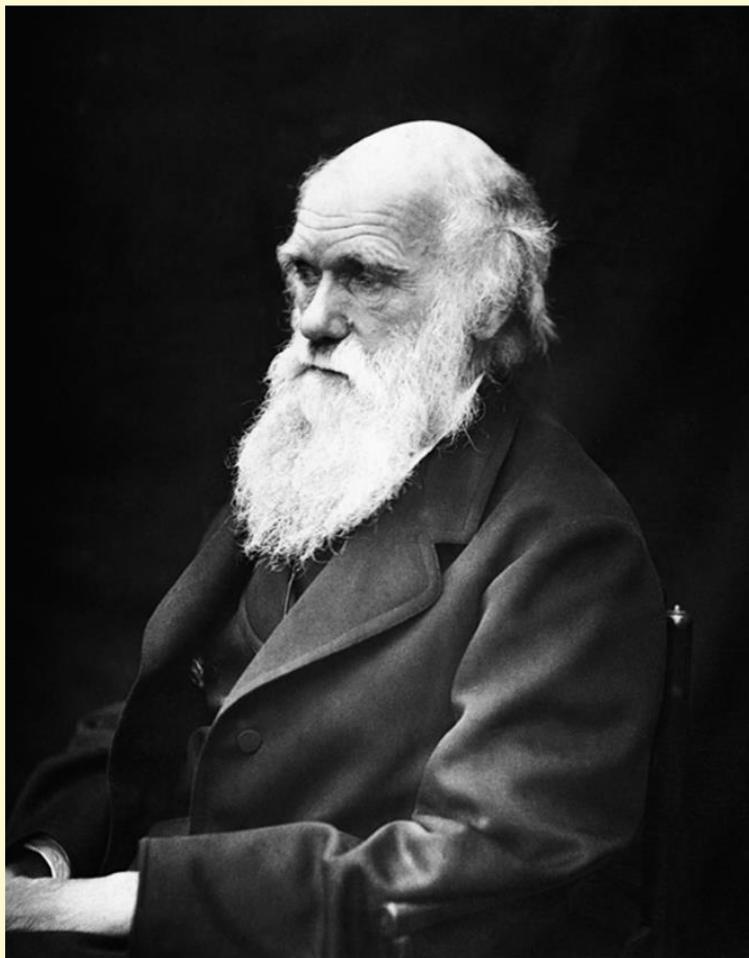
The term “species” was given a clear definition by the Swedish biologist Carl von Linné who believed that they were fixed and unalterable. The naturalist-travellers and early biologists were building their collections of specimens and wanting to classify them found Linné’s approach served their purpose and was compatible with their Christian beliefs.

But scientific evidence was starting to throw doubt on the fixity of species. The developing science of geology suggested that there had been living things which now no longer existed.



The study of fossils in rock strata of different ages suggested that there had been a progressive development from simple to more complex creatures. And so the concept of the evolution of living things started to gain a new credibility. Now is not an appropriate time to explore all the theories and ideas that were circulating during the

first half of the 19<sup>th</sup> century, but it should be noted that none of these theorists gained significant support amongst the great thinkers before Darwin.

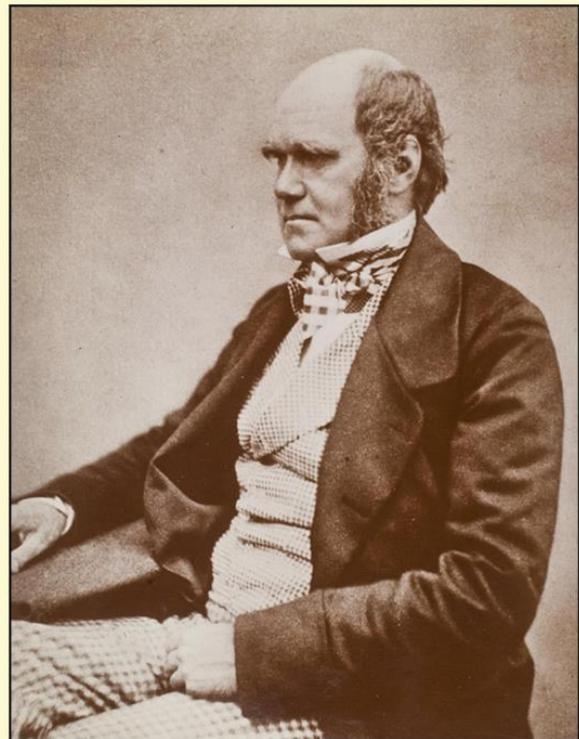
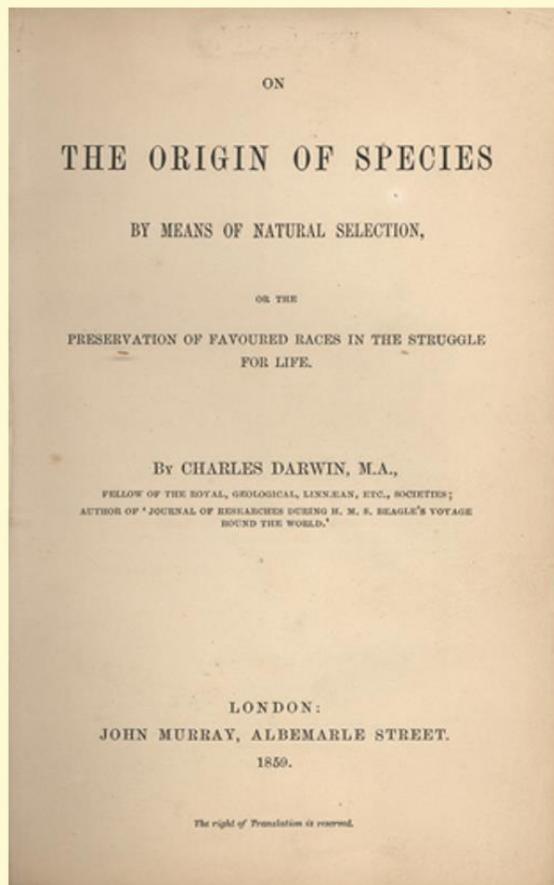


**Charles Darwin**

Darwin's investigations into the matter are well documented. In 1831, a year before Dodgson's birth, Darwin began his crucial voyage around the world in HMS Beagle.

The observations made on this voyage, together with his knowledge of the views and theories of the time enabled him to propose his own ideas on the mechanism for evolution – which he later named Natural Selection. His theory was developed as early as 1837, but he spent a good twenty years gathering data to support it. And even then, his great work was published sooner than he would have preferred when an essay by Alfred Wallace put forward similar notions.

Papers by both Wallace and Darwin were presented to the Linnean Society in 1858 and the Origin of Species came out the following year.



**Charles Darwin, 1809 - 1882**

We do not know if Dodgson read the book at the time, but we have good reason to believe that he was well versed in its theories. It seems everyone was discussing the matter – and the apparent contradictions between Darwin’s scientific observations and the widely accepted biblical record rocked the foundations of established institutions. It was especially challenging for the University of Oxford - founded on religious faith yet trying to embrace the new sciences.

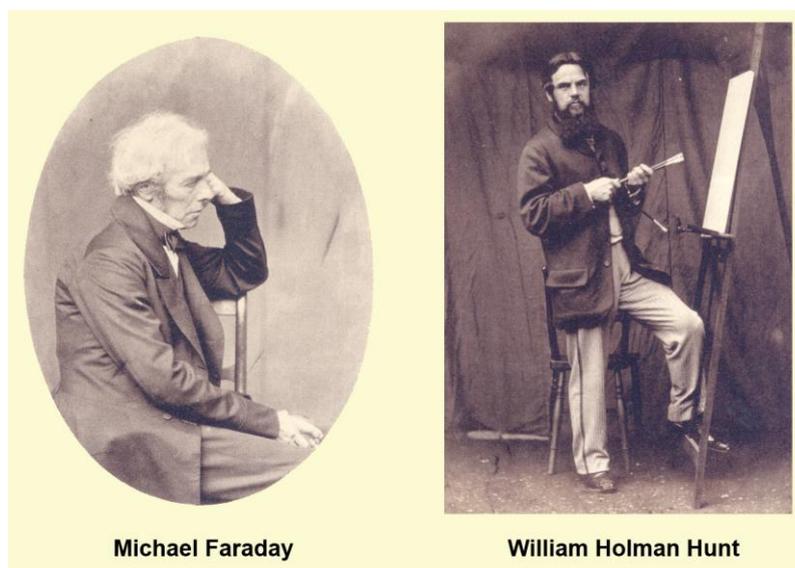
We can only guess at the difficulties Dodgson must have had with the new theory – sadly his diaries are missing for 1859 through to early 1862. Observing how he remained open minded yet reverent throughout his life leads us to believe that he would have been generally accepting of Darwin’s views but quietly sceptical of how to reconcile them with what he would have learnt from the bible. We’ll see later some

references to Darwin in Dodgson's own works which suggest to me that he was certainly not hostile to the man or his views (although some writers have drawn the opposite conclusion). Many others were in the same position as Dodgson, but some had more polarised views - as the 1860 meeting of the British Association for the Advancement of Science revealed.

The British Association was formed in 1831 and met at a different location once a year drawing together some of the greatest scientists and original thinkers of the time. It was decided to hold the 1860 meeting at the newly opened Oxford Museum – something which delighted Acland and his colleagues. The meeting consisted of a series of lectures and discussions over several days from the 27<sup>th</sup> June to the 4<sup>th</sup> July.

Knowing that many eminent people were going to be in Oxford for the meeting, Dodgson saw the opportunity to find himself some interesting subjects for his camera and he set up a make-shift studio in the garden of the Deanery at Christ Church.

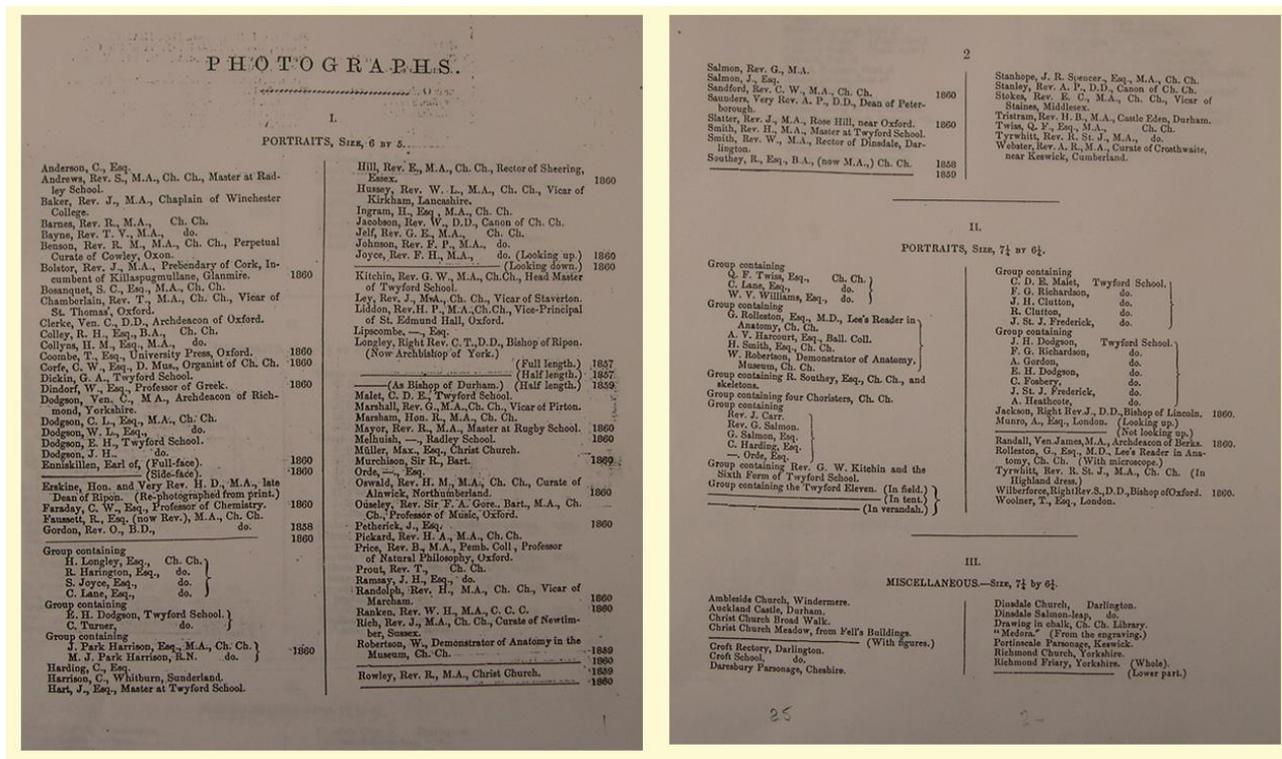
Dodgson was on the reception committee for men of science from foreign countries and distant parts of the UK. No doubt this made it easy for him to approach potential sitters and makes it likely that he attended the meeting itself. Jenny Woolf's analysis of Dodgson's bank account reveals that in June 1860 he paid two pounds two shillings to the British Association – possibly the price of attendance at the meeting?



**Michael Faraday**

**William Holman Hunt**

Dodgson's sitters during those few days include people familiar to us today such the scientist Michael Faraday and the artist William Holman Hunt. Shortly after the meeting, he published a list of his photographs which included several of the participants in the British Association meeting and others taken in previous months.

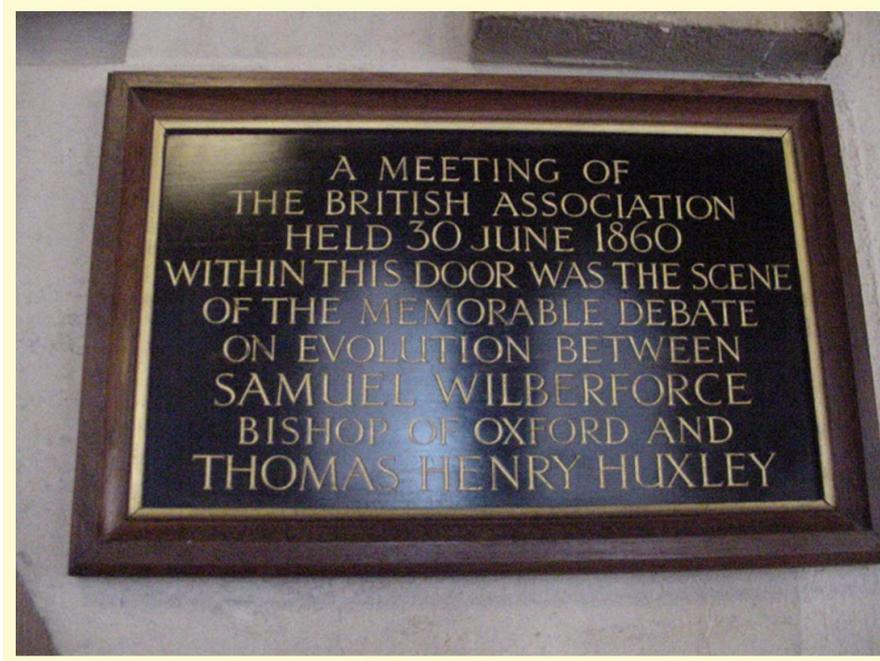


The exact purpose of this document is unknown, but it seems likely that it was a list he could show friends and colleagues who might want to acquire prints for themselves.

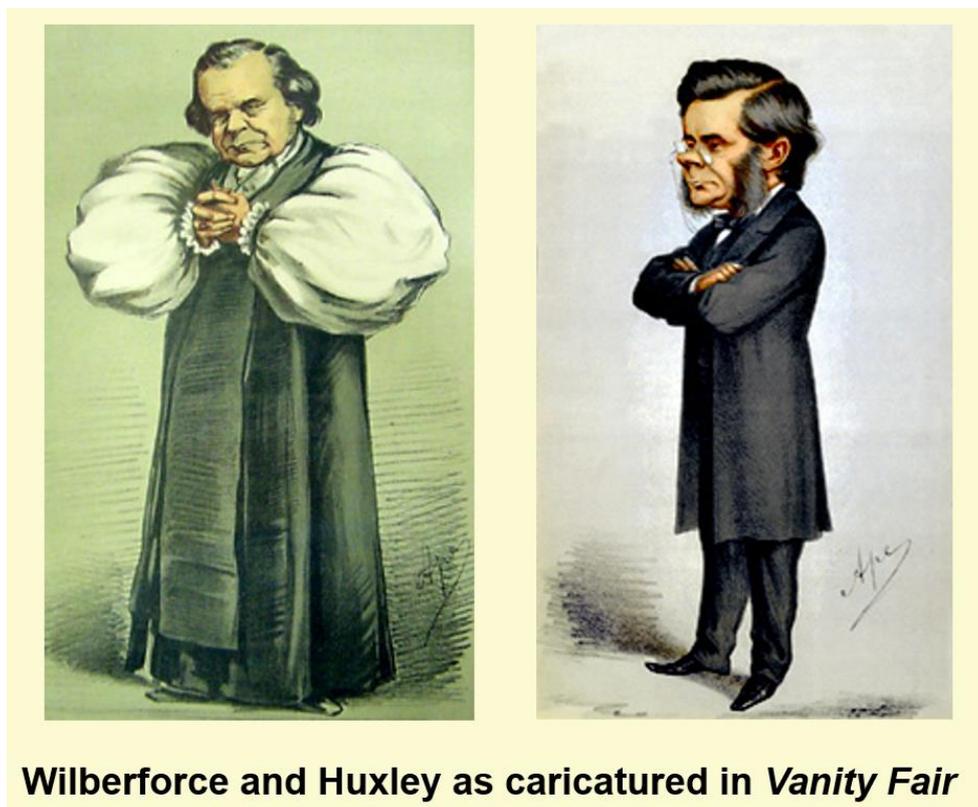
One important name on that list is Samuel Wilberforce, the Bishop of Oxford - the man known as Soapy Sam. Wilberforce was in the chair for some of the British Association meeting and has gone down in history for his untempered criticism of evolutionary theory and, perhaps, the most dramatic case of a joke falling flat in history.

The discussion of Darwin's work at the meeting was triggered by a paper presented by Professor Daubeny, after which heated arguments began, with Thomas Huxley the man known as Darwin's Bulldog, strongly defending the newly published

evolutionary theory. It seems the discussions were chaotic and a more structured debate was called for. This was arranged for the Saturday.



In the packed room, which is said to have squeezed in 700 people a real battle of giants began: Samuel Wilberforce versus Thomas Huxley.



**Wilberforce and Huxley as caricatured in *Vanity Fair***

There are no official transcripts of the debate and accounts of what was said vary quite a bit, with each contributor later recalling the events and often emphasising their own achievements. The most famous interchange was later described by Huxley when he recounted that Wilberforce spoke “for full half an hour with inimitable spirit, emptiness and unfairness. ... In a light scoffing tone, florid and fluent, he assured us there was nothing in the idea of evolution; rock-pigeons were what rock-pigeons had always been. Then, turning to his antagonist with a smiling insolence, he begged to know, was it through his grandfather or his grandmother that he claimed his descent from a monkey?’

This was the fatal mistake of his speech. Huxley instantly grasped the tactical advantage which the descent into referring to individual personalities gave him. He turned to Sir Benjamin Brodie, who was sitting beside him, and emphatically striking his hand upon his knee exclaimed, 'The Lord hath delivered him into mine hands.'

When Huxley gave his reply it was the turning point in the debate and the moment at which the general acceptance of Darwin’s theory is sometimes pin-pointed.

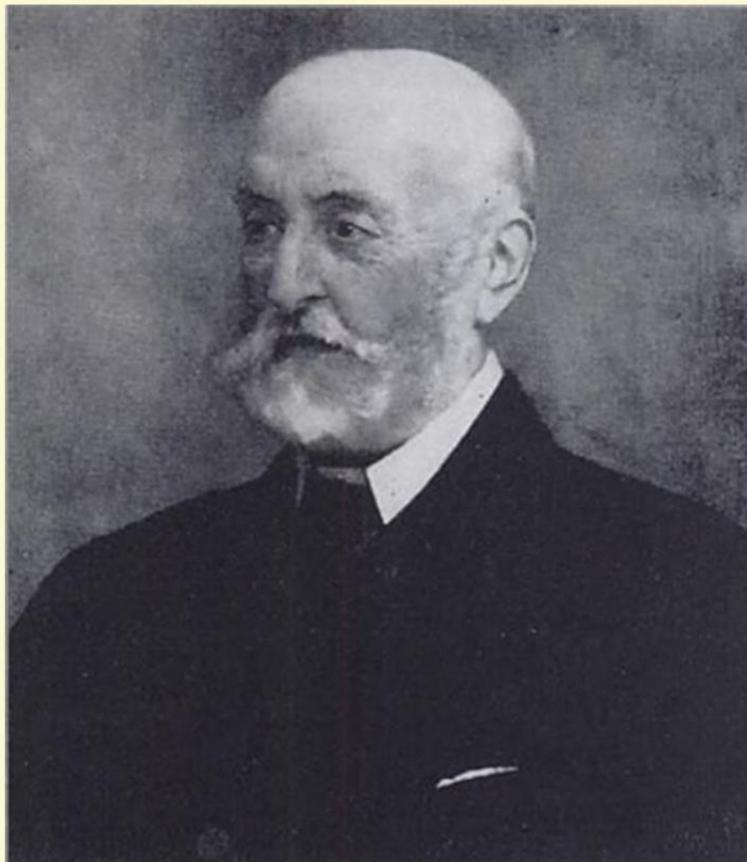
“A man has no reason to be ashamed of having an ape for his grandfather.” Said Huxley, “If there were an ancestor whom I should feel shame in recalling it would rather be a man - a man of restless and versatile intellect - who, not content with an equivocal success in his own sphere of activity, plunges into scientific questions with which he has no real acquaintance, only to obscure them by an aimless rhetoric, and distract the attention of his hearers from the real point at issue by eloquent digressions and skilled appeals to religious prejudices.”

It seems most likely that Dodgson was there to hear that exchange, but even if he missed it, he could certainly not have escaped the excited and endless discussions which arose afterwards and there is good reason to believe that he took a keen interest in Darwin’s work and that of his supporters and critics throughout his life.

Soon after Dodgson's death in 1898, most of his papers, books and effects were either destroyed or sold. Several auctions were held to dispose of his books and lists were produced. From these and other sources we can see that Dodgson owned numerous books on the natural sciences such as anatomy, botany, geology, etc and at least 20 specifically relating to Evolution, Darwin, his supporters and his critics.

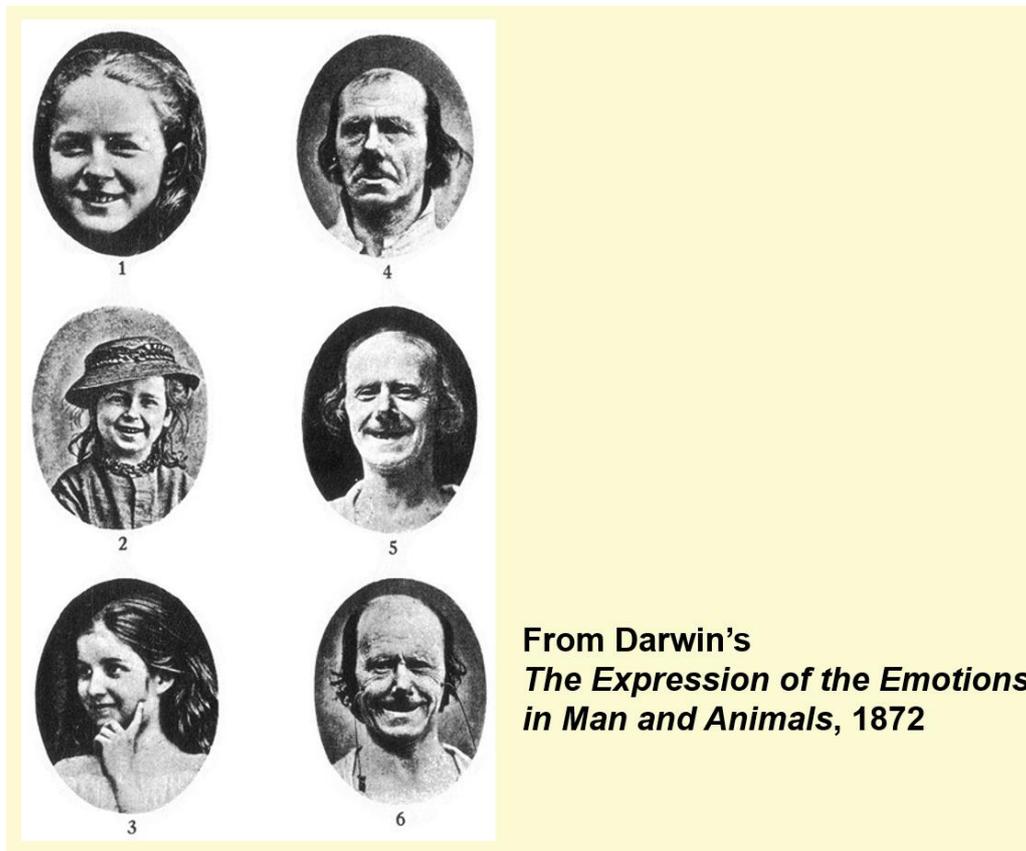
The only concrete information we have about Dodgson's views on evolution comes from his diary entry for 1 November 1874:

Not being well, I stayed in all day, and during the day read the whole of Mivart's *Genesis of Species*, a most interesting and satisfactory book, showing, as it does, the insufficiency of "Natural Selection" alone to account for the universe and its perfect compatibility with the creative and guiding power of God. The theory of "Correspondence to Environment" is also brought into harmony with the Christian's belief.



**St. George Jackson Mivart (1827 -1900)**

Mivart is a most interesting man. He seemed determined to find a way to reconcile the new sciences with established religious views: but sadly he managed to upset both the scientific community from he was ostracised and the Roman Catholic Church from which he was excommunicated. Curiously though Dodgson was probably one of his most sympathetic readers.



In 1872 Dodgson read Darwin's book *The Expression of the Emotions in Man and Animals*, illustrated with photographs by Oscar Rejlander. Dodgson wrote to Darwin and offered him the use of one of his own images for future publications on the subject. Darwin's reply was:

My dear Sir,

I thank you most sincerely for the excellent photograph and your very kind note.

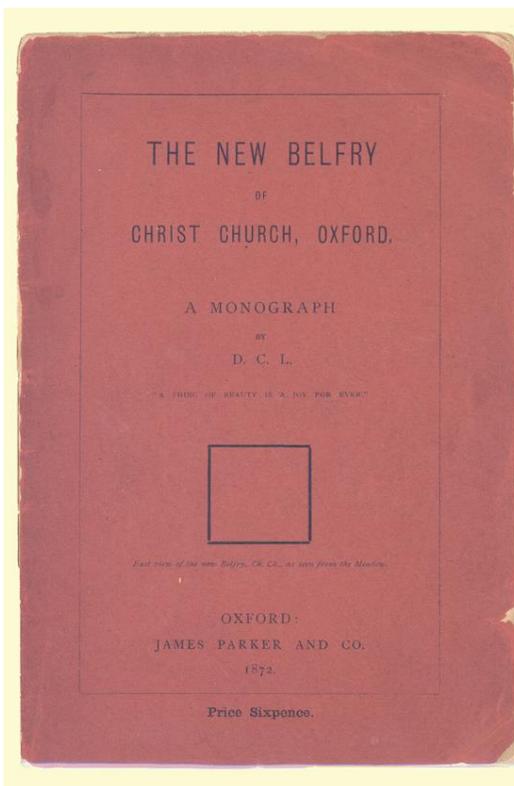
I am now employed on another subject and do not think I shall continue my observations on expressions; but I will not forget your obliging offer should occasion occur. I am at present far from well, so pray excuse brevity and believe me

Yours faithfully and obliged, Ch Darwin.

The image that was offered was of Flora Rankin, which Dodgson titled “No Lessons Today”, taken in 1863.



Although subsequent editions of the book came out, Dodgson’s image was never used.



**From *The New Belfry*  
by Charles Dodgson, 1872**

§ 8. *On the feelings with which old Ch. Ch. men regard the new Belfry.*

Bitterly bitterly do all old Ch. Ch. men lament this latest lowest development of native taste. ‘We see the Governing Body,’ say they: ‘where is the Governing *Mind*?’ And Echo (exercising a judicious ‘natural selection’ for which even Darwin would give her credit) answers—‘where?’

From time to time, references to Darwin appear in Dodgson’s own works. There are references to Darwin in the *New Belfry*, of 1872, and even a game called *Natural Selection* dating from 1878 in which players eliminate each other’s pieces until only the fittest survive.

In his *Sylvie and Bruno* novel, published in 1889, he talks of “Darwinism Reversed”. The narrator of the story engages in conversation with a lady on a steam train. “If Steam has done nothing else,” she says “it has at least added a whole new Species to English Literature!”

“The Booklets – the little thrilling romances, where the Murder comes at page fifteen and the Wedding at page forty –surely they are due steam?”

“And when we travel by Electricity” the narrator replies “if I may venture to develop your theory- we shall have leaflets instead of booklets and the Murder and the Wedding will come on the same page.”

“A development worthy of Darwin!” The lady exclaimed enthusiastically – “only you reverse his theory. Instead of developing a mouse into an elephant, you would develop an elephant into a mouse!”

Its a curious interpretation of evolutionary theory.

But perhaps the most interesting hint at evolution comes in a rather obscure way in the book for which Dodgson is most famous.

The published, *Alice’s Adventures in Wonderland* with Tenniel’s illustrations, as we know, evolved from the manuscript story *Alice’s Adventures Under Ground* illustrated by Dodgson himself.

Early in the story, when Alice sits and cries, then later shrinks in size, she finds herself swimming in a pool of her own tears.



*It was high time to go, for the pool was getting quite full of birds and animals that had fallen into it. There was a Duck and a Dodo, a Lory and an Eaglet, and several other curious creatures. Alice led the way, and the whole party swam to the shore.*

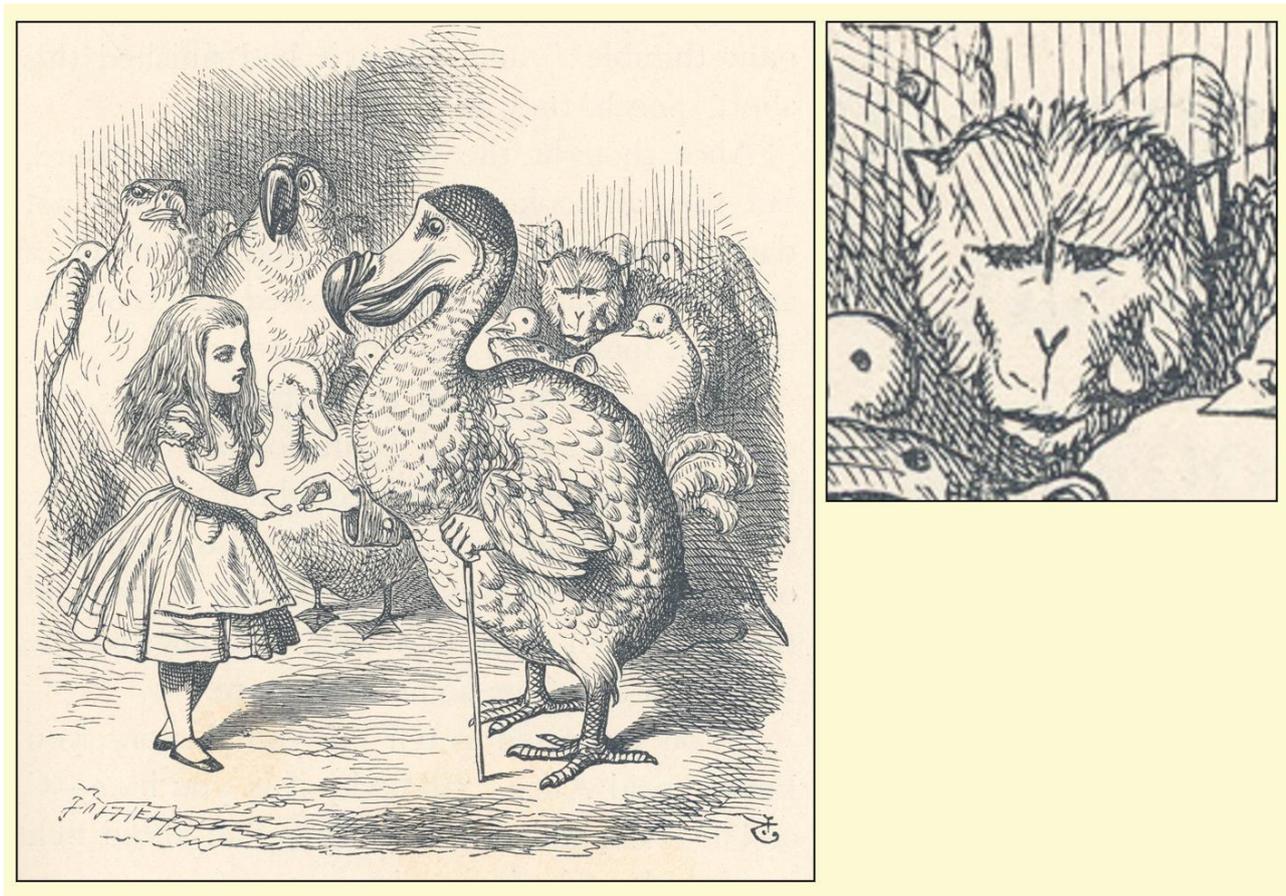
As she swims around she suddenly realises she is in the company of a large group of what Dodgson describes as “curious creatures”.

A Duck, a Dodo, a Lory and an Eaglet are all described in the text and appear in the illustration. These characters represent the real people who were on the boating trip during which the story was originally told. But what of the other creatures?

It is tempting to see this episode as a comment on evolution and the origins of life. The creatures are rushing to the shore as if only the fittest will survive and a diversity of species will emerge from the salty water onto the land, with the human, Alice – out in front.

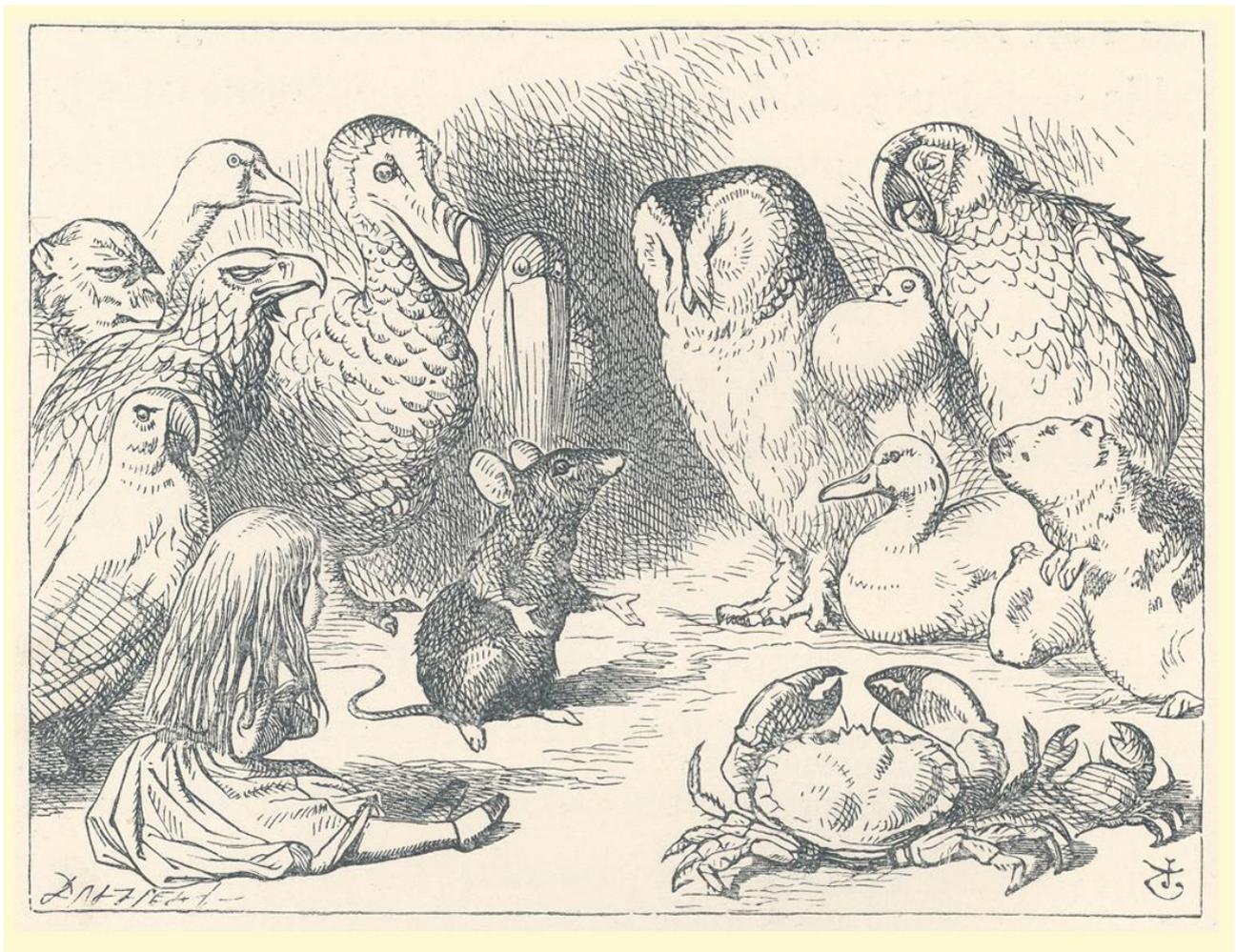


If we look closely, we see an ape in there – which many commentators have suggested is a reference to Darwin’s work. Remembering that famous photograph of Reginald Southey and the skeletons, it is difficult not to conclude that something was going on in Dodgson’s mind when he chose to draw that ape.



When John Tenniel drew the illustrations for the published version of the story, he also included an ape in that chapter – and the ape is very obviously placed: staring almost straight at us. Dodgson had altered the text of his story for publication, adding the caucus race as the means by which the characters dried themselves after leaving the pool of tears. Tenniel's monkey drops the same hints as Dodgson's own drawing about evolution, with the caucus race also suggesting that the various species were in a never ending competition to survive – yet one which never really starts or ends and with no real winner. That the Dodo, one of the species that didn't survive in reality, is presented as some kind of authority figure, adds a little dark humour to the evolutionary reference.

An ape also appears in the subsequent Tenniel drawing. In this illustration though, it is the pigeon who is staring straight at us. At least three writers have tried to make a big deal out of the presence of the pigeon in this illustration and later on in the text.



Their theories rest on the fact that pigeons are used as an important case study in the first chapter of the *Origin of Species* and, of course, referred to in Wilberforce's contribution to the great debate. However, Wonderland is so full of living creatures it is hard to see how the book could not contain something which also appeared in Darwin's book.

Some of these characters, like the Dodo, are as much a reference to the specimens which Dodgson and the real Alice saw at the Oxford Museum as they are to the debate on evolution. But these things often do have multiple sources.

There are several other theories about hidden meanings in the Alice books relating to Darwin, some quite bizarre ... thankfully, we have not got time to go into them so I can't tell you the one about the ape representing Henry Liddell and the Pigeon being the Dean's wife.

More interesting is the suggestion that the pool of tears represents the primeval sea in which life was first created. Bear in mind that ideas of spontaneous generation in the less sophisticated forms of life had not been dispelled until the early 1860s. And following the work of Louis Pasteur and others, scientists were looking for other explanations for the creation of those micro-organisms regarded as too simplistic for sexual reproduction. Ideas of a warm salty pond from which life could emerge occurred to Darwin himself. It is a little far fetched to claim that the pool of tears is a direct reference to Darwin's views, but discussion on the origins of life would have been very topical in the early 1860s and Dodgson would surely have joined in those conversations.

If we want to try to find wider Darwinian ideas in the Alice books we might look, among other things, at the way in which the frog and fish footmen have developed the ability to stand up; the way the baby regresses into the pig; or those curious hybrids – the Gryphon and the Mock Turtle.

Other readers have commented on the spiritual evolution that Alice undergoes as she crosses the chess board to become Queen in *Through the Looking-Glass*.

But whatever these characters and stories represent, if anything, and whether Darwinian influence is there or not, what we can be sure of is that *Alice's Adventures* were written against a background of great change and Dodgson was clearly aware of the importance of these developments in the natural sciences.

But Dodgson was essentially a mathematician – and whatever we might say about the state of mathematics at Oxford during his time, it was a discipline which sat comfortably within the University tradition of teaching. He had also studied classics as part of his degree and in spite of being an educator in science he believed that all undergraduate education should include the classics.

In a letter to the *Pall Mall Gazette* in May 1877, Dodgson describes the way in which the Natural Sciences have been introduced into Oxford as the thin end of the wedge.

The thick end being the exclusion of Latin, Greek, logic, philosophy and history from the curriculum altogether. Something which Acland, you will recall, was trying to avoid in the first place.

So having tried to make the case, by reference to Darwin, that Dodgson might be seen as interested in and supportive of Natural Science, I'll end with an extract from that letter which hints at Dodgson's traditionalist views and which shows that, whilst he is a Man of Science, he is not truly a Man of Natural Science.

He writes:

As a general principle, I do not think that the exclusive study of any one subject is really education; and my experience as a teacher has shown me that even a considerable proficiency in Natural Science, taken alone, is so far from proving a high degree of cultivation and great natural ability that it is fully compatible with general ignorance and an intellect quite below par. Therefore it is that I seek to rouse an interest, beyond the limits of Oxford, in preserving classics as an essential feature of a University education. Nor is it as a classical tutor (who might be suspected of a bias in favour of his own subject) that I write this. On the contrary, it is as one who has taught science here for more than twenty years (for mathematics, though good-humouredly scorned by the biologists on account of the abnormal certainty of its conclusions, is still reckoned among the sciences) that I beg to sign myself,

Your obedient servant, Charles L. Dodgson,.