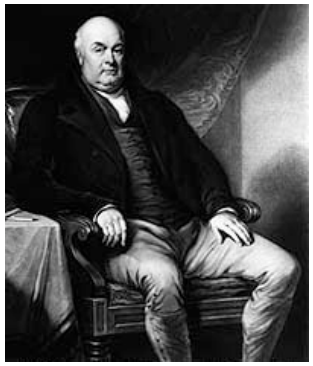
History of Evolutionary Thought

Part I: Kid Darwin

BIOL 4415: Evolution
Dr. Ben Waggoner

The Darwin Family

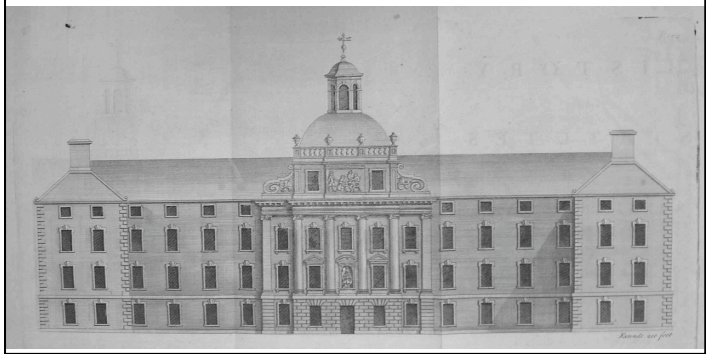


Dr. Robert Darwin (1766-1848) was a medical doctor in Shrewsbury (west of England, near the Welsh border). He became quite wealthy from his medical practice, from his marriage to a rich wife, and from various investments. . .

The Darwin Family, continued. . .

. . . and so his six children grew up quite well-off, including his fifth child and second son, Charles Robert Darwin, born in 1809. Here he is in 1816 (the year before his mother died).

We fast-forward, through a more or less uneventful childhood, to 1824, when Charles Darwin enrolled in the University of Edinburgh, in Scotland, to study medicine. Unfortunately, many of his professors were awful bores, and he couldn't stand the sight of blood.



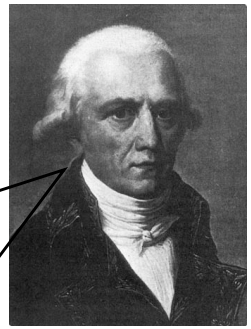
He dropped out after two years.

I shall ever hate the name of the Materia Medica [pharmacology], since hearing Duncan's lectures at eight o'clock on a winter's morning—a whole, cold, breakfastless hour on the properties of rhubarb! (Letter of April 18, 1847)

While he was there, however, he made the acquaintance of Robert Grant, a physician who'd given up medicine to study invertebrate zoology. Grant had some radical ideas about biology, which were inspired by the work of. . .

Jean-Baptiste Lamarck (1769-1832)

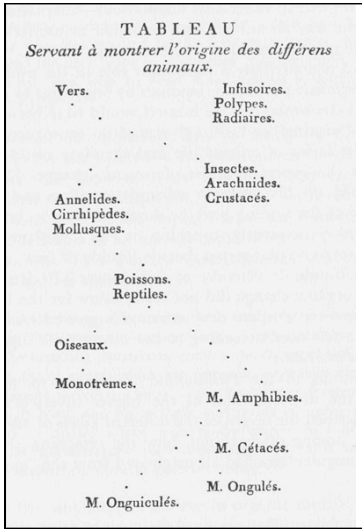
. . . the structure of the individuals and of their parts. . . their organs, their faculties, etc. etc. are entirely the result of the circumstances to which the race of each species has found itself subjected by nature.



"Lamarckian evolution"

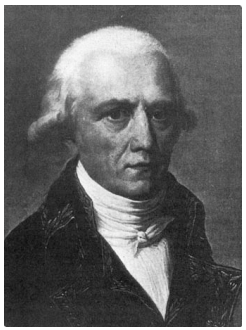
- Lamarck was the first to propose a *theory of evolution*.
  - Other authors had toyed with the idea of some kind of natural process producing new species—that idea goes back to some of the earliest Greek philosophers
  - Lamarck gets the credit, not just for arguing that new life forms could be produced from old ones, but for working out a theory of the process that did this.
  - His ideas were influential for a long time after his death. . .

An organism's environment would cause it to behave in certain ways. Behavior affected form. . . and changes in form could be inherited. Or so said Lamarck.



Over time, combined with what Lamarck thought was life's innate tendency to increase in perfection, this would give rise to diverse and complex life forms. Note how Lamarck diagrammed this process with a branching drawing. (The worms, "Vers", and protists, "Infusoires", are at the top; various mammal groups are at the bottom.)

Why is this man not smiling?



Lamarck's contemporaries considered his evolutionary work too speculative and far-fetched—a few made sarcastic jokes about it, but most just ignored it. Lamarck died poor and blind. However. . . .

Erasmus Darwin (1731-1802)

. . . Lamarck not only inspired Robert Grant, he may have inspired this English physician and thinker, Erasmus Darwin. At any rate, Dr. Darwin had some very similar ideas to Lamarck's, suggesting that all life formed "one living filament" as it had evolved from a common ancestor.

From thus meditating on the great similarity of the structure of the warm-blooded animals. . . would it be too bold to imagine, that in the great length of time, since the earth began to exist, perhaps millions of ages before the commencement of the history of mankind, would it be too bold to imagine, that all warm-blooded animals have arisen from one living filament, which THE GREAT FIRST CAUSE endued with animality, with the power of acquiring new parts, attended with new propensities, directed by irritations, sensations, volitions, and associations; and thus possessing the faculty of continuing to improve by its own inherent activity, and of delivering down those improvements by generation to its posterity, world without end!

- *Zoonomia, or, the Laws of Organic Life* (1794)

Dr. Darwin might have been taken a bit more seriously if he hadn't presented many of his ideas in the form of epic poems. (He was considered a great poet in his time, but his poetry hasn't really held up well.)

Organic life beneath the shoreless waves
Was born and nurs'd in ocean's pearly caves;
First forms minute, unseen by spheric glass,
Move on the mud, or pierce the watery mass;
These, as successive generations bloom,
New powers acquire and larger limbs assume;
Whence countless groups of vegetation spring,
And breathing realms of fin and feet and wing.

- *The Temple of Nature* (1802)

He might also have been taken more seriously if he hadn't been so enthusiastic about sex. . .

Behold, he cries, Earth! Ocean! Air above,
And hail the DEITIES of SEXUAL LOVE!
All forms of Life shall this fond Pair delight,
And sex to sex the willing world unite. . . .
HENCE on green leaves the sexual Pleasures dwell,
And Loves and Beauties crowd the blossom's bell;
The wakeful Anther in his silken bed
O'er the pleased Stigma bows his waxen head;
With meeting lips and mingling smiles they sup
Ambrosial dewdrops from the nectar'd cup. . .

- *The Temple of Nature* (1802)

Family Tradition?

But Erasmus Darwin was no buffoon; he was a respected doctor, inventor, and friend of some of the leading scientists of the time: James Watt, Joseph Priestly, Benjamin Franklin. . . And yes, Erasmus Darwin was Charles's grandfather. . . but young Charles Darwin wasn't directly influenced by his grandfather's work.

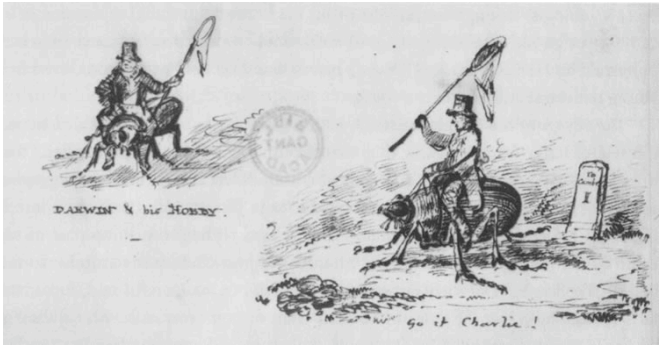
Did all this have some influence on the young Darwin's mind? At the time, probably not.

He [Grant] one day, when we were walking together, burst forth in high admiration of Lamarck and his views on evolution. I listened in silent astonishment, and as far as I can judge without any effect on my mind. I had previously read the 'Zoonomia' of my grandfather, in which similar views are maintained, but without producing any effect on me.
--*Autobiography* (1876)

Anyway. . . Realizing that he'd never be a medical doctor, Charles Darwin's father sent him to Cambridge University in 1828, to study for the Anglican priesthood.

The curriculum consisted mostly of math, Latin, Greek, and theology, none of which were appealing. "During the three years which I spent at Cambridge my time was wasted, as far as the academical studies were concerned. . . I attempted mathematics . . . but I got on very slowly. The work was repugnant to me." (*Autobiography*)

But Darwin had plenty of time to indulge his hobbies of hunting, and of collecting beetles (these cartoons of him were drawn by classmate Albert Way).



He also learned about natural science from professor John Stevens Henslow—in the classroom, but also on walks and hikes, at dinner, and other informal settings. Darwin became a close friend of Henslow's family.

At Henslow's recommendation, Darwin also studied geology in the field with professor Adam Sedgwick, one of the leading geologists of the time.

Darwin also read the works of Rev. William Paley, whose book, *Natural Theology*, was one of his favorites. . .

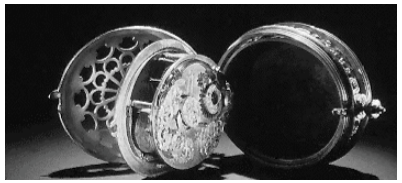
The marks of design are too strong to be got over. Design must have had a designer. That designer must have been a person. That person is GOD.

William Paley (1743-1805)

Paley used a metaphor which is still famous: God as a watchmaker, Nature as a watch.

But suppose I had found a **watch** upon the ground, and it should be inquired how the watch happened to be in that place. . . . the inference, we think, is inevitable, that the watch must have had a maker. . . . who comprehended its construction, and designed its use.

If the existence of a watch demands the existence of a watchmaker, then how much more must the existence of something as complex as a living being demonstrate that there must be a Creator! Or so said Paley. . .



(A problem with this idea is the problem of evil: why did the Creator, whoever he is, create pain and suffering, including so much pain and suffering that seems gratuitous and needless? I'll let y'all work that one out for yourselves, if you choose to. . . .)

Whatever you might think of this argument *now*—Paley, and natural theology, are historically important because they gave people a reason to study biology and look for adaptations. Certainly they impressed Darwin!

I do not think I hardly ever admired a book more than Paley's "Natural Theology". I could almost formerly have said it by heart.
—Letter, November 22, 1859