

The art of medicine

What Darwin learned in medical school

What image comes to mind when we think of Charles Darwin? Is it the young man clambering over the lava beds of the Galapagos? Or perhaps the somewhat mournful white-bearded old man? Either way, young naturalist or aged savant, he is the very father-figure of evolution.

Almost certainly you would not see him as a medical student. Yet there he was in Edinburgh, in 1825, and then again in 1826, following in well-trodden family footsteps, enrolled in medical studies. His father Robert despaired of his 16-year-old son ever amounting to anything; late in life, Darwin recalled his father having told him that “you care for nothing but shooting, dogs and rat-catching, and you will be a disgrace to yourself and all your family”. Robert was himself a physician, as was his famous father Erasmus before him. All the doctors in the Darwin extended family had been trained in Edinburgh—and now Charles was to join his older brother Erasmus (“Ras”) to learn the family trade.

Young Charles was not a promising student. He had been bored with the classical education he had been exposed to back in Shropshire. And he was no keener now to sit through what for the most part struck him as interminably dull lectures at the medical school. As ever, his heart and mind belonged outdoors—although apparently he and Ras, constant companions, also enjoyed the social blandishments on offer in 1825 Edinburgh. Historians have long chronicled Charles’ personal miseries in the operating theatre; he was far too squeamish at the sight of blood for any young man truly determined to become a doctor. But, although it is true that, by the end of the second term (1826) it was abundantly clear to Darwin’s father Robert that he was wasting his money sending Charles to Edinburgh, those two terms in medical school were actually fundamental to the very path Darwin followed in life—as experimental biologist and, most importantly, as founder of modern evolutionary biology.

How this could be so lies in the simple fact that medical schools then were rather different from what we know them as today. Science as a profession was in its infancy. Especially in Great Britain, most scientists were men with enough time, money, and background education to pursue their avocational interests. Physicians, landed farmers, clergymen, and barristers swelled the ranks of British science back then. And if you were to draw pay teaching and doing research in science at a university, you still had to be an ordained clergyman (as was the case at Cambridge University, for example, where Darwin went after Edinburgh) or a physician—the situation in Edinburgh.

The Edinburgh medical school, I was astonished to learn, had the finest natural history museum in Great Britain back when Darwin was there. The museum was founded and run by faculty member Dr Robert Jameson, a geologist of

“Neptunist” persuasions. Neptunists, in any case a dying breed in the 1820s, saw all rocks as derived from precipitates in a primordial ocean. Ironically, it was the Edinburgh farmer/physician James Hutton who had decisively shown a generation earlier that the black lavas and basalts in and around Edinburgh were in fact cooled from a molten mass.

Yet Darwin, who considered himself first and foremost a geologist from his *Beagle* experiences in the 1830s throughout the remainder of his life, thought Jameson’s lectures so dull that he vowed never to study the subject again. But I wonder what he made of Jameson’s last lectures in his course on Natural History—entitled “On the Origin of Species of the Animals”.

Edinburgh, it turns out, was a hotbed of radical thinking in the 1820s—and the medical school was right in the thick of things. If most faculty were expectedly conservative, many were not. Jameson himself endorsed the thinking of the French transmutationist (“evolutionist”) Jean-Baptiste Lamarck—and indeed, most of the radical ideas bandied about the medical school were French inspirations. And whether or not Jameson founded the student club, the Plinian Society (Darwin thought so, but modern historians differ on this point), the club itself exposed Darwin to some decidedly modern views.

Ras left Edinburgh after that first term—pursuing his training elsewhere for a medical career he never did actively embrace. Darwin, at first at a loss for companionship, intensified his relationships with fellow students who shared his love of the outdoors. And for 4 or 5 months, he became closely associated with the invertebrate zoologist Robert Grant, 16 years his senior, and yet another (non-practising) graduate of Edinburgh’s medical school. Grant is an arresting figure. Outwardly reserved, he was a man of great intellectual passions. He had studied with leading zoologists in Paris, and was enthusiastic about Lamarck’s ideas on transmutation, embracing this especially provocative concept along with Jameson, Robert Knox, and other radical intelligentsia of Edinburgh in the mid-1820s. Later in life, in his *Autobiography* written for his family’s eyes only, Darwin recalled a dramatic scene along the shores of the Firth of Forth when, out for a tramp with Grant, the latter suddenly burst forth with a paean of praise of Lamarck’s transmutationalism:

“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. Nevertheless it is probable that the hearing rather early in life such views maintained and praised may have favoured my upholding them under a different form in my *Origin of Species*.”

Note the mantra-like repetition of “no effect on me” in those first two sentences—which are usually all that historians quote. But Darwin’s essential honesty shines through when he admits that, given the importance his grandfather and his mentor Grant had in his life, there must have been “an effect on his mind”. It is a fair conclusion, I think, that Darwin was trying to have it both ways: acknowledge his intellectual debt, at the same time as establishing that he had not simply stolen his ideas from Erasmus Darwin or Robert Grant—or for that matter, from Lamarck.

Darwin had a penchant for affixing himself to willing, encouraging mentors. When he left Edinburgh, he went on to Cambridge and became known as “the man who walks with Henslow”. Darwin took the Reverend John Stevens Henslow’s botany course three times, and Henslow befriended and encouraged the aspiring naturalist in countless ways. It was Henslow who conveyed the invitation for Darwin to join the *HMS Beagle* in its voyage around the world.

Robert Grant had held a similar position earlier in Darwin’s life in Edinburgh. Grant’s transmutationalism led him to look for direct, evolutionary connections between plants and animals—among the simple “zoophytes” of the tidal pools and boulders along the shores of the Firth of Forth. Grant was actively publishing papers describing new species of marine invertebrates. Of the four papers he published in Jameson’s newly minted *The Edinburgh New Philosophical Journal* in 1826, three dealt with the larvae—and one proposed the new genus *Cliona*, a sponge that lives in holes bored into mollusc shells. Grant thought that *Cliona* demonstrates an evolutionary link between the simple sponges and the more complex cnidarians.

More to the point, Grant taught Darwin how to collect these simple marine life forms; how to take them back and examine them under a light microscope; and to interpret the anatomical intricacies of their fine structural details; and to link up larval stages with their proper organic source. All in the context of looking for anatomically intermediate structures pointing to evolutionary linkages between groups—up to and including evidence of links between the animal and plant worlds—a search inspired by Lamarck’s theories.

Historians have paid scant attention to an anonymous paper expounding, extolling, and extending Lamarck’s transmutationalism, also published in 1826 in *The Edinburgh New Philosophical Journal*. Commonly assumed to have been penned by Grant, it seems more likely that the journal’s editor, Robert Jameson, was the author. There is no direct evidence that Darwin himself read it—although he is known to have read Grant’s contributions to that same journal.

But the evidence is mounting that Darwin was equipped with the rudiments of biological research (enhanced in other directions by his later Cambridge experiences) that stood him in good stead on the *Beagle*. And I am now convinced that Darwin knew a lot more about Lamarck and transmutation



Down House, Kent, UK/The Bridgeman Art Library

Portrait of Charles Darwin (1840) by George Richmond

as a result of his sojourn in medical school than is usually “granted”. While a medical student in Edinburgh, he had actually read Lamarck and in any case was surrounded by a swirl of transmutation and other radical ideas.

But what convinces me most of the importance of his Edinburgh education was that he was actively looking at patterns of extinction, persistence, and appearance of species in the autumn of 1832—when he discovered his treasure-trove of fossils at Bahia Blanca along the coast of Argentina. This was shortly before he received his copy of Charles Lyell’s *Principles of Geology Volume 2*—devoted to explicating and dismissing Lamarck’s transmutationalism—and the commonly cited source of Darwin’s familiarity with Lamarck.

I don’t think medical school turned Darwin into a transmutationalist. It turned him, instead, into an experimenter and critical thinker. He arrived in Bahia Blanca prepared to look for patterns of the appearances and disappearances of species—very much as if he were testing the ideas of transmutation in search for natural causal explanations. He came back from the voyage a convinced transmutationalist. Not your typical medical school education, perhaps—but then again, not all that different in spirit from what goes on in the education of the best and brightest of today’s young medical researchers.

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Further reading

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- Desmond A, Moore J. Darwin. The Life of a Tormented Evolutionist. New York: WW Norton, 1991.
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