DIALOGUES WITH DARWIN

Edinburgh and Darwin's *Expression of the Emotions*

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Darwin's bicentenary

2009 marks the bicentenary of Charles Darwin's birth on 12 February 1809, and the 150th anniversary of the publication of *On The Origin of Species*, on 24 November 1859. Darwin's student years in Edinburgh were an important period in his intellectual formation: here he encountered the fruits of the Scottish Enlightenment, from the revolutionary geological theories of James Hutton to important advances in medical theory and practice, and adventurous developments in theological and philosophical thought fostered in the University and the City.

In conjunction with the University of Edinburgh and other Scottish and UK-wide academic and scholarly institutions, the Institute for Advanced Studies in the Humanities (IASH) joined the Edinburgh celebrations for the bicentenary by organising a series of "Dialogues with Darwin: Darwin and Edinburgh". The five symposia, held in the spring of 2009, explored aspects of his work in Scottish contexts including circumnavigation, anatomy, theology, and evolution itself. Together, these talks and discussions led by a series of international and local experts offer new angles for understanding Darwin as both a catalyst in the broader Enlightenment project and a model for its subsequent impact. From Patrick Geddes to Charles Bell to James Crichton-Browne, the Edinburgh connection offers a rich kaleidoscope of historical and intellectual links.

The speakers in the series were Professor Ian Duncan (University of California, Berkeley) on "Darwin, Circumnavigation, and the Aesthetics of World History"; Professor David Fergusson (University of Edinburgh) on "Darwin in Scotland";
Dr. Walter M. Stephen (former Chairman of the Sir Patrick Geddes Memorial Trust) on "Charles Darwin: Some Scottish Connections"; Dr. Gregory Radick (University of Leeds) on "Edinburgh, Enlightenment and Darwin's *Expression of the Emotions*"; and Revd. Dr. John Polkinghorne (St. Edmunds College, Cambridge) on "Evolving Creation". Each paper is published separately in this series of IASH Occasional Papers.

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About the author

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Synopsis

The legacies of Edinburgh are all over Charles Darwin's 1872 book *The Expression of the Emotions in Man and Animals*. By way of exploring those legacies this paper will consider the book as a dialogue with three Edinburgh-educated medical men. The first is Darwin's grandfather Erasmus Darwin, author of an earlier evolutionary account of the origins of emotional expressions. The second is Charles Bell, the anatomist who saw in human emotional expression evidence of divine design. The third is James Crichton-Browne, the son of a friend of Charles Darwin's from Edinburgh medical school days, and supplier of photographs and information about the emotionally expressive men and women cared for at the Wakefield Lunatic Asylum, where Crichton-Browne was director.

Edinburgh and Darwin's *Expression of the Emotions*

In Edinburgh University Library there is a bound volume containing the handwritten minutes of the Plinian Society for the years 1826-8. For a student society, it kept remarkably tidy minutes. From them we know that the teenage Charles Darwin, then a medical student in Edinburgh, attended his first meeting of this natural history club on 5 December 1826. We also know that the same meeting featured the reading of a paper by a friend of Darwin's, William A. F. Browne, on the 'anatomy of expression'. Earlier Browne had 'announced his intention' in giving the paper 'of refuting before the Society the views of Mr Charles Bell in the anatomy and Physiology of Expression.' Although the minutes do not elaborate further on the content of Browne's refutation, historians have supposed that Browne attacked Bell's notion that, when it came to emotional expression, there was a difference in kind between humans and animals. For Bell, humans had been endowed by their Creator with unique muscles in the face for the purpose of expressing uniquely human emotions.

Darwin's presence at the reading of Browne's paper is noted in one of the two most important books on Darwin to be published in this anniversary year, Adrian Desmond and James Moore's *Darwin's Sacred Cause: Race, Slavery and the Quest for Human Origins* (2009). (I shall come to the other most important book at the end.) Their treatment of Edinburgh in the new book is rather less flattering than in their 1991 biography. There, Edinburgh was the seat of Enlightenment medicine – 'the Athens of the North'. Here, it is a scene of intellectual and moral trial, from which Darwin, to his credit, emerges unscathed. It is the cradle of scientific racism and the 'skull science' that carried it forward. The Edinburgh of the era has long been identified with that premier skull science, phrenology; but phrenology has rarely been characterized as so robustly race-obsessed. Desmond and Moore suggest that just as phrenological doctrine taught that individual talents and limitations were determined by the structure of an individual's brain, as legible in bumps on the skull, so it taught that racial talents and limitations were determined by brain features characteristic of a race (and so of the skulls of its members). Phrenology and race ranking thus went together; and medical Edinburgh in the late 1820s was full of skulls and expert debate on the natural hierarchy these disclosed. The extraordinary thing about Darwin in Edinburgh, on the new interpretation, is that he seems to have taken no interest. Rather than throw in his lot with the race rankers, he studied taxidermy with a black ex-slave. More generally, on Desmond and Moore's reconstruction, Darwin stayed true to his family's brotherhood-of-man, anti-slavery, Whig tradition. Indeed, it is their contention in the book – and it has proved contentious – that this tradition was so strong in Darwin that it ultimately drove him to embrace belief in the common ancestry by descent not just of the human races, but of all species.

One would never guess from *Darwin's Sacred Cause* that there was any enduring legacy from Darwin's Edinburgh years. Yet in 1872, around half a century after that Plinian Society meeting (his first), Darwin published a whole book aiming, as Browne had done, to refute Bell on emotional expression. Oddly, *The Expression of the Emotions in Man and Animals* is not covered by Desmond and Moore; their history ends in 1871, with the publication of *The Descent of Man, and Selection in Relation to Sex*. But not only was the *Expression* an outgrowth of the *Descent* (starting life as a chapter in the latter), it is explicitly devoted to arguing for the unity of the human races through common descent. In what follows I shall attempt in a small way to suggest how fruitful it can be to consider the *Expression* as an Edinburgh book. After first introducing the book's contents, I will try and tease out some of the connections between it and Edinburgh, concentrating on Darwin's intellectual relationship with three Edinburgh medical men, including Bell. I will also suggest near the end that, however badly Edinburgh comes off in *Darwin's Sacred Cause*, Desmond and Moore have done sterling work there that may enable us at last to solve one of the outstanding historical puzzles about the *Expression*.

A brief overview of the *Expression*

Why do particular suites of movements go with particular emotions – crying with sadness, laughing with happiness, blushing with shame, and so on? That is Darwin's question in the *Expression.* As he explained near the start, he sought not only to provide a more satisfying set of answers than anyone had previously, but, in doing so, to show how much more illuminating an evolutionary perspective was than the old creationism.

To this end, Darwin brought forth a range of evidence which he regarded as furnishing a new 'foundation' for this branch of inquiry. In his introduction he mentioned six categories of evidence:

(1) observations of infants, since these feel the force of especially strong emotions;

(2) observations of the insane, for the same reason;

(3) the electrical stimulation of particular muscles in the face, as pioneered by the French experimental physiologist G.-B. Duchenne de Boulogne;

(4) skilfully rendered paintings and sculptures of emoting creatures – though Darwin found less instruction here than he had hoped for;

(5) answers to a questionnaire that he circulated to missionaries, colonial officers and other observers around the world in order to find about human emotional expression in the various races of 'man' (as Darwin put it), the better to distinguish what in emotional expression was innate and universal from what was acquired and local;

(6) observations of animals.

All six kinds of evidence run through the book, sometimes (categories 1 and 3) illustrated with photographs, sometimes (categories 2, 3 and 6) illustrated with engravings.

The main body of the book falls roughly into three parts. Each of the first three chapters deals with one of the 'general principles of expression' which Darwin puts to use in the rest – and it was vital to his evolutionist purpose, as he saw it, that the same principles accounted for human and non-human expression. After their introduction there follows a pair of chapters surveying emotional expression in animals. Then come eight chapters on human emotional expression. The book ends, like so many of Darwin's classic books, with a recapitulating conclusion that, far from merely rehearsing the earlier conclusions, reconfigures them in new and surprising ways.

Understanding a little of Darwin's three principles of expression will help us appreciate one of the main ways in which the book is so 'Edinburgh'. The first principle is what he called 'serviceable associated habits'. According to this principle, if, under the influence of an emotion, a creature happens to act in a way that 'serves' that emotion, in the sense of relieving it or gratifying it, then the emotion and the action come to be associated. The result is a habit: when the emotion comes, the action follows, automatically. And because, Darwin believed, habits can be passed on to offspring, they can go on to become innate, like instincts. Darwin's second principle, 'antithesis', depended intimately on the first. At the same time that a link forms between an emotion and a serviceable action, another link forms between an *opposite* emotion and an *opposite* action.[1] The third principle has the most awkward name: 'actions due to the constitution of the nervous system, independently from the first [i.e. from the outset] of the will, and independently to a certain extent of habit'. The core idea is that extreme emotions bring about surges of nervous energy, and these discharge along whatever channels the body makes available. Thus, Darwin argued, the tails of hostile or fearful animals vibrate.

Darwin's **Expression** *dialogues with Edinburgh medical men*

Where in the above can we detect the imprint of Edinburgh? I will organize my remarks around three distinguished products of Edinburgh medicine, as follows.

Erasmus Darwin (1731-1802)

By the time Darwin took it up, the associationism of his first principle (and by extension his second and third) was a venerable feature of English and Scottish psychological writing. To a first approximation, associationism held that when B regularly follows A – whether A and B are sensations or movements or ideas or some combination thereof – then a connection between them is strengthened. Here, it seemed, was the key to a Newtonian analysis of mind and action, exposing their mechanical, even materialist underpinnings. We now remember David Hartley and David Hume as the great mid-eighteenth-century exponents. But the associationist thinker from whom Darwin learned most – indeed the source of his first principle, as the historian of science William Montgomery showed – was Darwin's grandfather, Erasmus Darwin. Physician, bon vivant, poet, inventor, and theorist of life's progressive development, Erasmus Darwin treated emotional expression in Hartleyan fashion in his *Zoönomia, or the Laws of Life*, published in two volumes in 1794-6. Best known now for its evolutionism, the book is more generally a working-out of that materialist attitude to body and mind for which Edinburgh medicine was, according to taste, celebrated and reviled.

Darwin did not include his grandfather in the historical introduction to the *Expression*, nor mention him in the book outside of a couple of footnotes citing the *Zoönomia*. But there is no doubting the formative nature of the influence. While a student in Edinburgh Charles 'admired greatly the *Zoönomia*', as he later recalled in his autobiography. He was encouraged in this enthusiasm by the knowledge that his Edinburgh mentor in natural history, the anatomist Robert Grant, looked favourably on the similarly minded French theorist J.-B. de Lamarck. Living in London after returning from the *Beagle* voyage, Charles opened up his own notebooks on transmutation under the heading 'Zoonomia'. We have his copiously annotated copy of his grandfather's book. The passages on expression, or 'natural language', in Erasmus' phrase, received due attention; and indeed Charles' notebook theorizing in summer 1838 on expression, with emphasis on associations grown habitual and then hereditary, strongly resembled his grandfather's. In several ways, then – in his self-conscious sense of himself as Erasmus Darwin's grandson, in his regarding emotional expression as among the topics to be addressed by a theorist of life's development, and in adopting an associationist stance right from the start in his expression theorizing (the first two principles of expression can be found in the notebooks) – Darwin's debt to his grandfather's Edinburghian precedent on emotional expression is manifest.

Charles Bell (1774-1842)

It is an intriguing question, little investigated up to now, whether Bell saw his own work on emotional expression, first published in 1806, as in part a critical, creationist rejoinder to Erasmus Darwin. Although born and raised in Edinburgh, Bell did not come from a long line of Edinburgh medical men (unlike Charles Darwin, whose father Robert – Erasmus' son – was an Edinburgh-educated doctor).

Bell's father was a Church of England minister; and, though his father died when Bell was only five, this background surely goes some way to explaining the son's later enthusiasm for marshalling the evidence of anatomy to demonstrate the Creator's wisdom, goodness and power, in his book on emotional expression but also, among other places, in his Bridgewater treatise, entitled *The Hand: Its Mechanism and Vital Endowments as Evincing Design* (1833). The connection to medicine came through his brother, John, a surgeon who, in the latter eighteenth century, put on very successful private anatomy classes in Edinburgh. Charles assisted his brother, learning medicine from him and from lecturers at Edinburgh University. But he eventually came to regard Edinburgh as a dead-end professionally – biographers suggest that university professors, jealous of John's success, blocked hospital work – and in 1804 Charles moved to London, where he made his career until his triumphant return to Edinburgh in 1836 as professor of surgery.

When William Browne presented his animadversions on Bell's book in 1826, it had recently been published in a revised and expanded second edition, under the title *Essays in the Anatomy and Philosophy of Expression*. The first edition and third, posthumous one, published in 1844, had titles that made it rather clearer that the book was in the first instance an artist's manual, aiming its lessons on the anatomy of expression at anyone who aspired to paint or draw or sculpt emotionally expressive humans and animals with accuracy. The natural theological passages that provoked

Browne and, later, Darwin are nothing like as conspicuous as readers of Darwin's *Expression of the Emotions* are led to expect. Yet in his introduction to the *Expression* Darwin gave Bell pride of place in the roll-call of predecessors, as part of the problem (his creationist exceptionalism about humans, who were, in Darwin's paraphrase, 'created with certain muscles specially adapted for the expression of his feelings') but also part of the solution (Darwin praised Bell especially for his discovery that blood bulges in a vessel near the eye whenever air is exhaled violently – a phenomenon that, for Darwin, played a key part in the origin of a number of emotional expressions). As with Erasmus Darwin's work on expression, so with Charles Bell's work: the evidence we have points to a prolonged engagement on Charles Darwin's part – in those Plinian Society minutes; in his London notebooks of the late 1830s and early 40s; and in his copy of the major book on expression (he owned and annotated the 1844 edition).

James Crichton-Browne (1840-1938)

It is not William Browne but his son, the Edinburgh-born James Crichton Browne, who figures in the *Expression*'s introduction and the rest of the book.[2] It is striking how closely James in his interests and career kept to his father's precedent. Like William, James studied medicine at Edinburgh University, became fascinated by the mind as a function of the brain, and went on to make his mark as an asylum physician promoting progressive treatment of the insane. Where William as a medical student was a devotee of the Edinburgh phrenological publicist George Combe – and, a propos of the 1826 anti-Bell paper, it is worth recalling that human-animal mental continuity was a major theme in phrenology – James at Edinburgh studied under Thomas Laycock, then teaching a course on medical psychology and mental diseases later celebrated as the first of its kind in the United Kingdom. After further studies in London and Paris, as well as periods working in asylums around

England, James in 1866 was appointed medical director of an asylum in Wakefield, in West Yorkshire. Over the next decade he transformed the Wakefield asylum into an innovative research centre, best-remembered now for the *West Riding Lunatic Asylum Medical Reports* published between 1871 and 1876 (the predecessor journal to *Brain*) and as the site of David Ferrrier's epoch-making animal experiments establishing the localization of sensory and motor functions in discrete regions of the cerebral cortex – an updated form of phrenology that remains central to our neuroscience.

It was in 1869 that Darwin, through the alienist Henry Maudsley, was put in touch with Crichton Browne as someone who could help in collecting evidence on emotional expression in the insane. The historian Sander Gilman reminds us that this was the heyday of psychiatric photography, when interest in the diagnostic possibilities of photography was lively, and cameras were familiar technologies in asylums. Crichton Browne sent Darwin quite a few photographs and a great many letters and manuscripts containing detailed observational reports. The latter were used extensively; but of the photos, Darwin included only an engraved copy of one, showing a woman whose bristling hair was supposedly expressive of her insanity. Darwin quoted Browne as saying of such a woman that 'the state of her hair is a sure and convenient criterion of her mental condition'.[3] Furthermore, according to Browne, as reported by Darwin, the reverse held too: when the bad hair days become less bad, it is a signal that the sufferer is en route to recovery. So frequently did Darwin refer in the *Expression* to his correspondence with Browne that, in the letter asking Browne's permission to use the mad-hair photograph, Darwin commented that the book in progress 'ought to be called by Darwin & Browne'.

A new answer to an old puzzle about the *Expression*

Let us return to Darwin's three principles of expression. I have not up to now made much of how 'un-Darwinian' they are. In texture, they belong to a different universe from the theory of natural selection and the exquisitely functional structures and instincts that theory explains. For Darwin, emotional expression was non-functional. Expressions arise not in order to communicate emotional states but because bodies are habit-forming and habit-inheriting. Accordingly, natural selection was barely mentioned in the book. Whence this peculiar character? Or to put the question another way: why, in a book that started as a chapter of the natural-selection-showcasing *Descent of Man*, did Darwin take his explanatory tools from theorizing that predated the arrival of natural selection theory in the autumn and winter of 1838 – indeed, that harked back to the antique theorizing of his grandfather?

Historians of science have offered a number of answers, all of them of interest, none of them adequate. Desmond and Moore's new book permits a glimpse of a new answer.[4] What binds the *Expression* to *Darwin's Sacred Cause* is Darwin's commitment to upholding the common ancestry of the human races. Desmond and Moore show, more vividly and comprehensively than previous historians, that this commitment was intertwined with the stance against slavery that he absorbed early on from his family. And it is in the *Expression* that we find what Darwin himself advertised, in the book's conclusion, as 'a new argument in favour of the several races being descended from a single parent- stock.' He went on:

> No doubt similar structures, adapted for the same purpose, have often been independently acquired through variation and Natural Selection by distinct species; but this view will not explain close similarity between distinct species in a multitude of unimportant details. Now if

> we bear in mind the numerous points of structure having no relation to expression, in which all the races of man closely agree, and then add to them the numerous points, some of the highest importance and many of the most trifling value, on which the movements of expression directly or indirectly depend, it seems to me improbable in the highest degree that so much similarity, or rather identity, could have been acquired by independent means. Yet this must have been the case if the races of man are descended from several aboriginally distinct species. It is far more probable that the many points of close similarity in the various races are due to inheritance from a single parent-form, which had already assumed a human character.

Here Darwin aligned himself with a point that he had made clearly in the *Origin* and the *Descent*: adaptive characters are much less useful for reconstructing genealogical relationships that nonadaptive ones, since the former can be shared by unrelated kinds of creatures, while the latter tend to be shared only by kin. If emotional expressions serve to adapt humans to their world, then natural selection might have built them into independently derived human groups. But if, as Darwin persuaded himself (and tried to persuade his readers), emotional expressions are not adaptive in this way, then they can have become characteristic of all human groups only thanks to inheritance from a common ancestor. On this analysis, then, Darwin's deep commitment to a belief in the common ancestry of humankind, coupled to a drive – from whatever source deriving, and at whatever moment emerging – to show that his evolutionary theories vindicated that belief, may have combined to keep Darwin keen on a body of 'un-Darwinian' explanatory principles.

Conclusion

In a preliminary way, I have tried here to throw some light on the Edinburgh legacies active in Darwin's *Expression* and to show how the latest scholarship on Darwin can help us better understand why that book is as it is. But anniversaries are also opportunities to remind ourselves of important lessons from older scholarship, lessons perhaps not as fully absorbed as they ought to have been. I am thinking, in the context of this collection on Darwin and Edinburgh, of Jonathan Hodge's classic 1985 paper 'Darwin as a lifelong generation theorist', reprinted in a collection that is the other most important Darwin book of the anniversary, Hodge's *Darwin Studies: A Theorist and his Theories in their Contexts* (2009). By 'generation theorist', Hodge means a theorist concerned to understand the capacity of living substance to make more of itself, at all levels of biological organization, from the particles that constitute tissues to the species that constitute lineages. In a year that saw Cambridge University take ownership of Darwin on a scale that no other institution could hope to match, it is salutary to remember that Hodge in that paper argued that the pro-Cambridge propaganda of Darwin's son Francis – a Cambridge professor and editor of the first life-and-letters volumes – had gone unchallenged for too long. In Hodge's view, Edinburgh, and above all Darwin's time there under Robert Grant, mattered far more than Cambridge in turning Darwin into the sort of theorist that he became. Indeed, Darwin's evolutionary theorizing is best understood as a bringing together of Charles Lyell's geology – itself a deeply Edinburgh, Scots-Enlightenment enterprise on the Hodge interpretation – with Grant's preoccupations with generation. While I have concentrated here on just one element of Darwin's evolutionary theorizing, Hodge reminds us that the whole can be seen, needs to be seen, as in dialogue with the Scottish Enlightenment, and with Edinburgh as its capital. Recently he has gone even further, arguing, in anniversary talks, that it was largely because of Edinburgh, and in spite of Cambridge, that Darwin became the thinker whose work we still cherish. I close with a command in fine Edinburgh spirit: discuss.

Notes

[1] Darwin's own showstopper example – with photographic evidence no less – is that a helpless man's shrugged shoulders, open palms and so on contrast point by point with an indignant man's squared shoulders, clenched fists and so on.
[2] He gave himself a hyphenated name later in life
[3] This was the kind of thing that seemed to vindicate psychiatric photography: if only one could group together enough pictures of enough sufferers of a given condition, then one could pick out the otherwise elusive visual sign of the condition.
[4] For more by way of criticism of previous efforts and considerations in favour of the one made here, see my paper 'Darwin's puzzling *Expression*', in press in *Comptes rendus de l'Academie des sciences*, *Série biologies*, in a special issue on 'un autre Darwin' edited by Jean Gayon and Michel Veuille.

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