

## Editorial

## Darwin's contribution to psychiatry

Edward Shorter

**Summary**

This November we celebrated the sesquicentennial of the *Origin of Species*, a landmark in the history of biology. Yet Darwin's chief contribution to psychiatry appears in *The Expression of the Emotions in Man and Animals* (1872), where he describes 'the grief

muscles', later identified as a sign of melancholic illness.

**Declaration of interest**

None.

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November 24, 2009, was the 150th anniversary of the publication of Charles Darwin's *On the Origin of Species*.<sup>1</sup> What's in it for psychiatry?

Numerous authors have correctly assigned enormous importance to the concept of evolution for the development of mental medicine, as for all the biological sciences.<sup>2</sup> This is true, but too vague to be of immediate interest.

**The omega sign**

Darwin's own illnesses have transfixed many observers, as over his long years he displayed a changing mixture of organic disturbances, hypochondriacal somatic feelings and frank mood disorders.<sup>3,4</sup> This gives him something in common with many of the grand invalids of the 19th century, such as Henry James's sister Alice or the diagnostic fascinomas, such as Josef Breuer's Anna O and Napoleon. Darwin's flatulence and vomiting have certainly rendered him an object of retrospective speculation to a small cottage industry asking: What was wrong with Darwin? But these endlessly intriguing speculations about what Darwin had overshadow the substance of what he contributed.

Darwin's actual contribution to psychiatric learning appears not in *Origin of Species* but in his often overlooked work, *The Expression of the Emotions in Man and Animals*, published in 1872.<sup>5</sup> There he described what subsequently was called *omega melancholicum* or 'the omega sign', a facial expression involving a wrinkling of the skin above the nose and between the eyebrows that resembles the Greek letter omega. It seems to be diagnostic of melancholic illness.

In *Expression of the Emotions*, Darwin gave a clear description of melancholia: 'After the mind has suffered from an acute paroxysm of grief, and the cause still continues, we fall into a state of low spirits; or we may be utterly cast down and dejected'. Those individuals affected 'no longer wish for action, but remain motionless and passive . . . the circulation becomes languid; the face pale; the muscles flaccid; the eyelids droop'. But what struck Darwin in particular was the pattern of contraction of the brow muscles of the corrugator region: 'The eyebrows not rarely are rendered oblique, which is due to their inner ends being raised. This produces peculiarly-formed wrinkles on the forehead, which are very different from those of a simple frown. . . . The corners of the mouth are drawn downwards, which is so universally

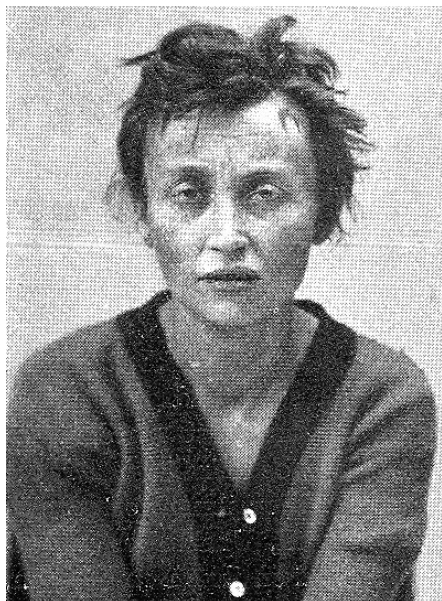
recognized as a sign of being out of spirits, that it is almost proverbial'.

Darwin went on to describe the spasmodic muscle movements of sobbing and the 'peculiar furrows formed on the forehead. These muscles . . . may be called, for the sake of brevity, the grief-muscles'. Non-clinician that he was, he nonetheless realised there was some special feature in the physiognomy of melancholic individuals that was diagnostic of their underlying mental state, in the way that serum cortisol and a positive dexamethasone suppression test would also serve as biological indicators of melancholia.<sup>6</sup> He concluded with an insight that would not be out of place in the neurotransmitter era: 'We can understand how it is, that as soon as some melancholy thought passes through the brain, there occurs a just perceptible drawing down of the corners of the mouth, or a slight raising up of the inner ends of the eyebrows . . . and immediately afterwards a slight suffusion of tears. A thrill of nerve-force is transmitted along several habitual channels, and produces an effect on any point where the will has not acquired through long habit much power of interference. In this case, as well as in many others, the links are indeed wonderful which connect cause and effect in giving rise to various expressions on the human countenance.'<sup>5</sup> This is quite a clear early statement of a biological agenda for psychiatry.

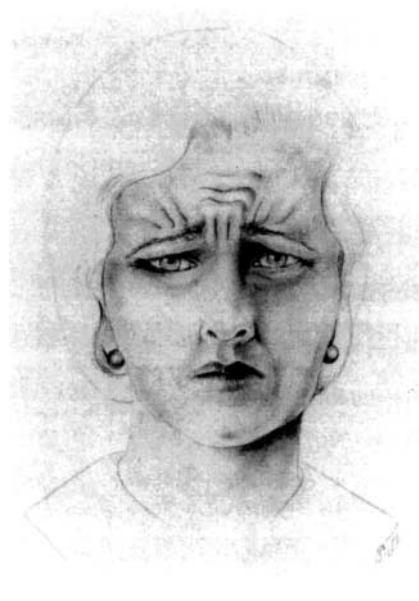
In 1878 German psychiatrist Heinrich Schüle at the Illenau Mental Hospital proposed the term 'the melancholic omega' for the contractions of what Darwin had called 'the grief muscles' in melancholia: 'The posture and gestures are rigid and constricted, the features as though carved in stone, namely the wrinkles of the brow, the characteristic furling of which over the dorsum of the nose displays the melancholic "omega"'.<sup>7</sup>

Schüle thus launched the concept of an omega sign upon its rather desultory career in psychiatry, a considerable uptake in Europe, almost none in Britain or the USA. Oswald Bumke, professor of psychiatry in Munich, described in 1924 the 'puzzlement' (*Ratlosigkeit*) of his patients 'with their characteristic facial expression: the elevated eyebrows, the vertical skin folds over the glabella, the searching, wide-open eyes, the tense features . . .' (Fig. 1) and said these and other signs of puzzlement were found 'not just in amentia, and highly anxious and agitated melancholia patients . . . but very commonly and in highly characteristic form also among schizophrenics'.<sup>8</sup>

After the Second World War, interest in 'Darwinian' insights into psychiatric illness, such as seeking a biological basis for disorders such as melancholia, faded. In the heyday of psychoanalysis it was the unconscious mind and not the integuments of the brain that demanded investigation, and psychiatry had as little interest in facial expressions as in viewing slices of brain tissue under the microscope. Yet in the 1980s biological thinking did begin to revive, and with it curiosity about the facial muscles



**Fig. 1** Photograph of patient showing 'puzzlement' (*Ratlosigkeit*) with omega sign. Reproduced from Bumke,<sup>8</sup> p. 874.



**Fig. 2** Drawing of patient showing omega sign and Veraguth's fold. Reproduced with permission from Greden *et al.*<sup>9</sup>

as a pathway to the brain. In 1985 John Greden and the biologically oriented team about him at the University of Michigan found distinctive electromyogram (EMG) patterns in the facial corrugator muscles (Fig. 2).<sup>9</sup> And Michael Alan Taylor and Max Fink mentioned the omega and 'Veraguth' signs in their biologically oriented overview of melancholic illness.<sup>10</sup> (In 1911 Swiss psychiatrist and physiologist Otto Veraguth proposed oblique folds on the upper eyelids as diagnostic of melancholia.)<sup>11</sup>

Yet apart from these few quickenings of interest, it would be fair to say that in psychiatry today, curiosity about Darwin's grief muscles – about the omega sign – does not go beyond antiquarianism. In an era when the discipline is keenly searching for biological indicators of disease, is it possible that this lack of inquisitiveness is a mistake?

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First received 17 Aug 2009, accepted 21 Sep 2009

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