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The mutable face

Michele Barker and Anna Munster

In this chapter we focus on the ways in which the neurosciences intersect with psychology and how, together with imaging technologies and techniques of identification, these come to constitute a complex, contemporary field of ‘faciality’. We refer to our own work, which examines how the face and scientific imaging combine to create this shifting field. Here we explore the historical links between the early natural and medical sciences of the nineteenth century and contemporary obsessions with facial symmetry and ‘genuine’ facial expression found in neuropsychology and neural marketing. We draw upon the history of facial expression as it works its way through the early medical photographic images of hysterics’ faces in Charles Darwin’s *The expression of the emotions in man and animals*. Ideas about the face as a site for the expression of genuine and staged emotion that germinated in early neuroscience have now become part of contemporary analysis of cultural and social phenomena, such as Barak Obama’s 2008 presidential campaign. In the video installation *Duchenne’s smile*¹ we make these historical and contemporary links, examining emerging paradigms for how we imagine identity today at the intersection of expression, technologies and securitisation.

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1 Michele Barker and Anna Munster, *Duchenne’s smile*, two-channel video installation, 2009.

Figure 5.1: Photographic montage depicting different facial expressions induced by electrical currents.

Source: Photographs by Guillaume Duchenne de Boulogne, from *Mécanisme de la physionomie humaine, ou, analyse électro-physiologique de l'expression des passions*, 1862, copyrighted work available under Creative Commons Attribution only licence CC BY 4.0.

Duchenne's ultimate legacy may be that he set the stage, as it were, for Charcot's visual theater of the passions and defined the essential dramaturgy of all the visual theaters, both scientific and artistic, that have since been conceived in the attempt to picture our psyches ... In the end, Duchenne's *Mecanisme de la physionomie humaine* and the photographic stills from its experimental theater of electroshock excitations established the modern field on which the struggle to depict and thus discern the ever-elusive meanings of our coded faces continues even now to be waged.²

The human face is often seen, culturally and analytically, as the primary site of the expression of emotion and character, becoming the place for imaging and fixing identity. Yet identity is a complex and fickle phenomenon to capture, relying not simply upon historical norms but also technical developments, the rise of particular scientific paradigms and the relation of these to modes of visual perception. During periods of accelerated technical and scientific change, what the face 'expresses'—and hence what kind of identity resides on or behind it—is open to a number of coexisting conceptions. The face, then, is a surface, but not one that simply reveals or hides the depth of emotion or meaning. Instead, this surface is itself a complex meshing of technical and expressive histories of the measuring and organisation of emotion. The imaging of the face by specific media—such as photography, and now facial-recognition software and databases—is caught up with these histories of the face's surface, participating in and contributing to a specific regime of measurement. This regime finds its apotheosis today in technologies for imaging the face as a surface that is recognisable, expressible within tightly circumscribed patterns and, ultimately, the object and manifestation of a socio-technical formation of bioinformatic control.

This chapter examines how the imaging of the face as a site of emotion and expression drew initially on the role photography played in the development of a taxonomy of emotions in the work of Charles Darwin. It particularly traces the ways in which Darwin drew on the photographs of neurologist Guillaume-Benjamin-Amand Duchenne de Boulogne, who worked at the Salpêtrière hospital in Paris during the second half of the nineteenth century. Duchenne used electro-physiological devices wired to the faces of his subjects

2 RA Sobieszek, *Ghost in the shell: Photography and the human soul, 1850–2000*, Cambridge, MA, MIT Press, 2003, p. 79.

to send electrical currents that would hold facial expressions in place to match the long shutter speeds his camera required. The chapter casts light on this entanglement of expression, technics and imaging as it also discusses the authors' audiovisual artwork, *Duchenne's smile*. In this video installation, we explore the heritage and legacy of what is now known as the Duchenne smile—the staging and construction of 'genuine' expression in the genesis of neurological science and psychology via the work of Darwin, Duchenne and others—through to the contemporary capture of facial expression in face recognition software. We also discuss the shift from the imaging of the face in the earlier attempt to 'freeze' expression to a fascination with fleeting and barely seen micro-expressions that are today seen to characterise the 'truth' of the face. We argue that it is important to identify the ways in which the face continues to be redrawn as a control surface by combining with new techniques and media and in conjunction with social and political currents and movements.

In 1872, almost two decades after the publication of *On the origin of species*, Darwin's *The expression of the emotions in man and animals* was published. This work meshed Darwin's theories of evolution with what he identified as the instinctive—and universal—behaviours of human beings. In arguing for a shared human and animal ancestry via evolution, he directly questioned Charles Bell's *Anatomy and philosophy of expression*,³ which claimed human expression to be the result of a divine musculature.

With physiognomy still widely revered, and camera-based photography in its infancy, *Expression* offered a mix of the familiar along with the novel, made possible by new imaging technologies.⁴ Much has been written about Darwin's observations and his use of

3 Charles Bell, *Essays on the anatomy and philosophy of expression*, London, John Murray, 1824.

4 Darwin himself makes reference to the physiognomical drawings of the seventeenth-century painter Charles Le Brun. Le Brun was interested in contributing to a fledgling and pseudoscience of physiognomy in which the face could be 'read' for a range of true expressions of the passions—wonder, reverence, admiration and so on. Darwin, however, explains that he is not interested in physiognomy per se because it concentrates on expression as recognition of (underlying) character. Darwin is more interested in the relations between the movement of the facial musculature and the movement of emotions via expression across the face. He therefore sets up the possibility for a new regime of faciality, as we will begin to outline in this chapter, one that is not concerned with depth and personhood but rather with surface and a moving field of visibility discerned across the face. See Darwin, *The expression of the emotions in man and animals*, London, John Murray, 1872, pp. 1–5.

heliotype plates to create photographic reproductions to illustrate his text, for this was one of the first instances of a scientific publication being illustrated with photographs. Until the nineteenth century, scientific illustration—linocuts, woodblock, watercolours—adhered to a set of unwritten standards: the expectation was that the illustration resembled the subject matter being discussed and this confirmed the authority of both the author and the artist. According to Phillip Prodger, the introduction of photographic illustration rendered this system useless:

Once the vision threshold was breached, new thinking was required. Photographs assumed a dual role. They illustrated something but they were also experiments in their own right. They became more than mere pictures—they became data. At that point, scientists became concerned about exactly how their photographs were made. They developed self-contained protocols to enable like-minded scholars to reproduce their results.⁵

Darwin was to find images from a variety of sources, including the Swedish photographer Oscar Rejlander, who was better known for altering and manipulating photographs than his ability to photographically illustrate a scientific treatise. A fine-art painter, Rejlander has come to be regarded as one of the first wave of art photographers, known for introducing the composite image into the photographic mainstream. Not surprisingly, Darwin's choice of Rejlander and the subsequent highly stylised images Darwin created for *Expression* would be questioned by future generations. But for Darwin, ultimately, image production was not a matter of process but rather an end result.

Nevertheless process did matter, and perhaps of greater significance here was the inclusion of images resulting from the work of neurologist Guillaume-Benjamin-Amand Duchenne de Boulogne. Duchenne was based at the Salpêtrière hospital in Paris, where he researched muscular electrophysiology—the perceived electrical dysfunction underlying neurological conditions, ranging from strokes and epilepsy through to the more questionable areas of hysteria and insanity. It was his work using electrical currents to isolate certain facial muscle groups—published in his treatise *The mechanism of human facial expression*,

5 Phillip Prodger, *Darwin's camera: Art and photography in the theory of evolution*, Oxford, Oxford University Press, 2009, pp. xxiii.

or an electro-physiological analysis of the expression of the passions applicable to the practice of the fine arts⁶—that came to the attention of Darwin (see Figures 5.2 and 5.3).

Figures 5.2 and 5.3: The facial expression of fear being induced by electrical currents.

Source: Photographs by Guillaume Duchenne de Boulogne, from *Mécanisme de la physionomie humaine, ou, analyse électro-physiologique de l'expression des passions*, 1862, copyrighted work available under Creative Commons Attribution only licence CC BY 4.0.

Darwin was deeply interested in Duchenne's work but ultimately had reservations that the extreme facial expressions produced by the neurologist's research would be misread or would require more information than was possible to provide in *Expression*. Of the few Duchenne images he did use, he requested some be redrawn—with the electrical apparatus removed from the picture. But it is precisely the relationship between Duchenne's electro-physiological devices and the resulting images that resonate the most in the contemporary context. The images appear, literally, shocking, and offer a disturbing insight into some of the experimental medical and scientific practices of the mid-nineteenth century.

6 Guillaume-Benjamin-Amand Duchenne de Boulogne, *The mechanism of human facial expression*, trans. RA Cuthbertson, Cambridge, Cambridge University Press, 1990 [1862].

Figure 5.4: Left: Horror and agony; Figure 5.5: Right: Terror.

Source: Both figures copied from photographs by Guillaume Duchenne de Boulogne, in Charles Darwin, *The expression of the emotions in man and animals*, Chapter XII, 'Surprise, Astonishment, Fear, Honour', 1872, copyrighted work available under Creative Commons Attribution only licence CC BY 4.0.

The afflictions of the inmates of the Salpêtrière made them perfect candidates for Duchenne's research and documentation: muscular paralysis and facial anaesthetics made them extremely malleable. The flow of sustained electrical currents allowed Duchenne to overcome the limits of photography's then long shutter speeds to have his sitters 'hold' a pose for an extended period. As Prodger notes:

Instead of accelerating the photographic process to produce instantaneous images, as others had tried to do, Duchenne devised a system for freezing the activity of his subjects long enough to accommodate the lengthy exposure times.⁷

In calibrating the speeds of his subjects to the speed of the technology, Duchenne reveals a moment that moves beyond Darwin's fleeting emotions; while the expressions are undeniably involuntary, they are difficult, as Darwin discovered, to classify with any certainty. His electrical probes enabled him to isolate and control the appearance of various fluxes of emotional states yet always out of context of any real event. Although using photographs as well as illustrations gave *Expression* an air of scientific authenticity, the technical challenges of speed were yet to be overcome. Around the same time that Darwin and

⁷ Prodger, 2009, pp. 81–2.

Duchenne were considering facial expressions and how to capture them, French surgeon and physiologist Etienne-Jules Marey was attempting to record movement. In 1874, he developed the photographic gun that enabled him to take 12 frames per second. By 1882 he had successfully created what would be termed a chronophotographic fixed-plate camera, equipped with a timed shutter. Thanks to this technique he was able to combine successive images of a single movement on a single plate. By 1890 he had successfully developed a system of sequential images on transparent celluloid and an electromagnetically operated camera to display them.⁸

In the two-channel video installation *Duchenne's smile*, we explore the heritage and legacy of the Duchenne smile, from the staging and construction of 'genuine' expression in the development of nineteenth-century neurological science through to attempts to capture facial expression in contemporary face-recognition software. The installation questions whether images and the capture of 'real' facial expressions are part of a social and technical system constructing 'true' emotions. Further, it asks what affective and institutional politics arise from this typology of 'real emotions'. The work explores how this typology supports such diverse organisations and forms as police forces, public relations and marketing firms, securitisation and the media's imaging of contemporary politics.

The left channel contains tightly cropped images of Duchenne's portraits from his studies at the Salpêtrière. Beneath the images run fragments of horizontally scrolling text—specifically the elaborate chapter titles that Darwin used in *Expression*. The text format is reminiscent of the captions used in contemporary news bulletins: an unrelenting streaming of events.

8 For further information about this and other techniques and apparatuses constructed by Marey see Francois Dagognet, *Etienne-Jules Marey: A passion for the trace*, trans. Robert Galeta and Jeanine Herman, New York, Zone Books, 1992, pp. 106–7.

Figure 5.6: *Duchenne's smile* (still), two-channel video installation, Michele Barker and Anna Munster, 2009.

Source: Courtesy of the artists.

The right channel of the work, unhindered by the technicalities of real-time change, actively engages with the process of speed, here undermining the speed of real-time media delivery by allowing change to happen gradually over the duration of the piece. A head is framed by an almost cartoon-like vector representation of a face with ellipses for the eyes and a rectangle for the mouth. Not exactly a cartoon, it is rather the bounding boxes used in contemporary facial expression research (psychological and algorithmic) to isolate and record segments of the face. The bounding box is itself part of the contemporary regime of faciality, as it reduces the corporeality of the face to a schematic sign, which functions to include and exclude facial material for capture and further analysis. The notion of a regime of faciality rather than just a genre of portraiture is drawn from the philosophy of

Gilles Deleuze and Félix Guattari.⁹ An entire regime of faciality is put in place by the connection and overlap of social, technical, aesthetic, economic, semiotic and cultural ‘machines’ across a specific historical or contemporary period. For Deleuze and Guattari, such machines do not have to be specifically technical; instead they operate according to a clear function that acts in conjunction with matter: ‘When the faciality machine translates formed contents of whatever kind into a single substance of expression, it already subjugates them to the exclusive form of signifying and subjective expression.’¹⁰

Here faciality has coalesced into a machine that organises expression itself. Examples of such organisations of expression via faciality include the way in which the face of Christ organises an entire expressive religious machine of suffering, guilt and subjugation. A more contemporary example of facialisation can be found in human–computer interaction, which tends to organise computational expression around the concept of the *interface* and, frequently, icons of smiling faces (emoticons, the start-up diagram of a face on computers and so on). Just such a facialisation machine can be seen to be operating in the diagrammatic element of the bounding box in facial-recognition software (depicted as in the right channel of *Duchenne’s smile*), which attempts to organise all expressions according to its constraints. The regime to which this box belongs is a contemporary one, in which identity is mapped, controlled and expressed bioinformatically. Digital information in this way functions to express a biopolitics that is played out across the surface of the face, and through which the face becomes *the* dominant surface for tracking, tracing and controlling the subject.

Does continuity or rupture best describe the relations between contemporary regimes of faciality and those of the nineteenth century? What do we inherit from Duchenne and Darwin, and what has changed in our new facial regimes? For it is not as if one vast regime of faciality spans all history. Rather, what is important is the way in which the diagram of the face is always combining differently with new techniques and technologies and in conjunction with a socio-technical

9 Gilles Deleuze and Félix Guattari, *A thousand plateaus*, trans. Brian Massumi, Minneapolis, University of Minnesota Press, 2005, pp. 176–85.

10 Deleuze and Guattari, 2005, pp. 179–80. For an extended discussion and critique of faciality in interface design, see Anna Munster, *Materializing new media: Embodiment in information aesthetics*, Hanover, NH, Dartmouth College Press, 2006, pp. 117–49.

machine. In the wake of 9/11, securitisation measures, taken by the US government especially, have exploded around biometric research and development. These have been deployed in facial-recognition software and retina scanning at airports and in voice analysis of recordings of actual and potential terrorist suspects.¹¹ One can easily see how such technologies share a lineage with the profiling of human types that began with the criminological sciences of the nineteenth century and their deployment of anthropometrical and physiognomical techniques to produce fixed facial and corporeal identities. As Michel Foucault had already suggested in 1978 for a range of biopolitical forms of control, first emerging in the eighteenth century, these were techniques for the management and governance of the entire life of the human.¹² Darwin's systematisation of human emotions via a taxonomy that relied upon fixed facial expression recorded photographically seems commensurate with this biopolitical project.

The installation *Duchenne's smile* is a visual response to these issues of continuity and rupture, indicated especially in the right video channel as the subject's face is gradually pixellated and overlaid with bounding box elements, which are similar to those used in facial-recognition software. Pixellation of the subject's face in the right channel over time makes the viewer aware of a digital aesthetic at work, which has become so ubiquitous as to be almost naturalised in contemporary forms of portraiture. By foregrounding the encoding that is taking place, the installation raises questions about not just the authentic smile but also the authentic face. Any semblance of the indexical that may have occurred in Duchenne's portraits has ceased to exist in the contemporary example of portraiture that is the installation *Duchenne's smile*.

It is also the case that certain branches of contemporary psychology that use techniques for capturing and interpreting facial expression also construct certain continuities with Darwin. The evolutionary psychologist Paul Ekman has styled himself as the successor to Darwin's project of expressing emotions in 'man and the animal'. Paul Ekman and Warren Friesen's late 1960s research examined 'micro-

11 For example, see Adam Peneberg, 'The surveillance society', *Wired Magazine* online, 2001, www.wired.com/2001/12/surveillance/.

12 Foucault's lecture series of 1978 given at the Collège de France signal these preoccupations. The English translation of these has only been recently published. See Michel Foucault, *Security, Territory, Population*, London, Palgrave, 2007, p. 16.

expressions', which built on psychotherapeutic work undertaken in that decade. Facial and bodily movements ordinarily imperceptible to the human eye were observed through frame-by-frame scanning of video recordings of therapeutic sessions: 'Micro displays may be fragments of a squelched, neutralized or masked display.'¹³ According to Ekman and Friesen, if you were able to see or train yourself to see at the rate of video recording—1/25th of a second—you could observe a micro-expression. Importantly, they argued that these betrayed both 'real emotion'—the truth of what someone was feeling—and attempts to mask or deceive the observing eye. One would expect the keen observer, on the other hand, to receive contradictory information from facial cues: simulated messages, micro-leakage of information contradicting simulations, and such deception clues as squelched displays and improperly performed simulations.¹⁴

In the 1970s, Ekman and Friesen developed the Facial Action Coding System (FACS).¹⁵ This is an instructional set of techniques for categorising facial expression based on the groups of facial muscles that produce the expressions, and which they called 'Action Units'. Then they developed FACS AID, a database that facilitates the relational linking of facial expressions to their psychological interpretations. Ekman further consolidated the connection between micro-expressions and the FACS system, relating the involuntary micro-movements of facial muscles such as we see in the Duchenne smile with the display of 'trustworthy' emotional displays, on the one hand, and *voluntary* micro- and macro-movements across the face with a person's potential to mask emotion and deceive an observer, on the other.

When emotional expressions lack a muscular movement that is difficult to make voluntarily, that expression should be less reliable; and those expressions that contain the reliable muscle should be more likely to be trustworthy.¹⁶

13 Paul Ekman and Wallace V Friesen, 'Nonverbal leakage and clues to deception', *Psychiatry*, vol. 32, no. 1, 1969, p. 89.

14 Ekman and Friesen, 1969, pp. 98–9.

15 For further information on FACS see the website Dataface, maintained by Ekman and Friesen, face-and-emotion.com/dataface/facs/description.jsp.

16 Paul Ekman, 'Darwin, deception, and facial expression', *Annals of the New York Academy of Sciences*, 1000, 2003, pp. 205–21.

There are two important points to draw from Ekman and the late twentieth-century contribution to contemporary regimes of imaging, interpreting and organising the face as a surface of expression. First, in order to observe human emotion on the face at its most expressive and most genuine, the observer must calibrate their vision to the temporality of media technologies. We have, then, replaced human vision with what Paul Virilio calls machine vision.¹⁷ Second, although the machine vision of video recording reveals micro-expressions, the micro-expression itself both reveals and masks; it is capable of supplying truth and deception simultaneously. Only by ongoing training and the calibration of human vision to the speeds of machine vision is the expert observer able to make the call between one and the other. Hence a new regime of faciality emerges in which the moving image and the face come to organise a relation to truth, to the subject being observed and to the observer. It is these relations that organise contemporary surveillance, and so much more insidiously than simple surveillance, even if the latter is now ubiquitous.

The constant fluctuations between truth and deception in this new regime of facialisation provide the drama and indeed atmosphere of the television series *Lie to me*.¹⁸ The character of Cal Lightman, who heads up The Lightman Group corporation in the series, is loosely modeled on Ekman and his Ekman Group. Just like Ekman's corporation, The Lightman Group's employees are deployed by law enforcement agencies to solve crimes from homicide to terrorism. Using techniques based on FACS and technologies such as voice analysis to 'catch' and read micro-expression, Cal and his employees calibrate their observations to the real time of media and computational biometric technologies. But this calibration means that they are constantly subjecting everything—including each other's facial expressions—to these techniques. In a regime in which micro-expressivity assumes primacy, both truth and deception become intra- and intersubjectively interchangeable. What *Lie to me* both captures and engenders in its constant search for both truth and deception across the face is the broad atmosphere of suspicion that permeates contemporary societies

17 Paul Virilio, *War and cinema*, London, Verso Books, 1988.

18 The series was created by Samuel Baum and originally aired on Fox Television between 2009 and 2011.

governed by these new methods of control and securitisation: societies in which, potentially, 'Anyone can be presumed to be a candidate for insider threat', as put by US Department of Homeland Security.¹⁹

Crucially, what has changed for the contemporary facial regime that both images and interprets the human subject is that we are not simply dealing with a ramping up of techniques of governance derived from the nineteenth century. The human is now not simply to be subjected to techniques of management but itself becomes a technique via its enmeshing with technologies of the moving image. This human is a category that functions as a technique for managing a broader scoping out of the contemporary technosocial scape:

Human eyes are capable of high-resolution, stereo-optical vision with immense range, and, integrated with a highly plastic brain, make humans uniquely capable of discovery, integration, and complex pattern recognition. Human hands constitute a dexterous, sensitive biomechanical system that, integrated with the brains and eyes, are unmatched by current and near-future robotic technologies. Humans operate in groups synergistically and dynamically, adjusting perceptions, relationships and connections as needed on a real-time and virtually instantaneous basis. Human language capabilities exist and operate within a dimensional space that is far more complex and fluid than any known artificial architectures.²⁰

We see such a scoping-out emerging in the 2004 National Plan for Research and Development in Support of Critical Infrastructure Protection. This plan amounts to techniques and strategies for producing what are called the 'Common Operating Picture for Critical Infrastructure'. This picture is produced by 'sensing out' deceptive behaviours at the micro or molecular level in persons who are equally deemed trustworthy and threatening.

The picture or image produced in the contemporary moment is not, then, the profile of an individual or even a type of human being with circumscribed characters and behaviours, as it was especially at the height of nineteenth-century anthropology, criminology and psychology. That is, when Darwin was writing and Duchenne taking

19 Department of Homeland Security Science and Technology Directorate, *The national plan for research and development in support of critical infrastructure protection*, 2004, p. 43, www.dhs.gov/xlibrary/assets/ST_2004_NCIP_RD_PlanFINALApr05.pdf.

20 Department of Homeland Security, 2004, p. 63.

photographs. Instead, we are now dealing with a completely abstracted yet highly technical image—an abstract machine of faciality—that must be constantly subjected to attenuation and calibration so as to maintain operability. Humans are only part of this picture and, now lacking determined character and specific intention, the profiler and profiled become interchangeable. Distinctions made at the level of intention, character and action are ultimately of little importance for such a bioinformatic regime. This is why catching the ‘wrong suspect’ is not something that requires explanation but can be passed off as a mere ‘system’ error. This is increasingly played out through systems of recognition in high-risk arenas such as airports. In 2009, for example, a Californian student, Nicholas George, was randomly singled out at Pomona airport for questioning by Transportation Security Administration (TSA) officers:

George had been singled out by behavior-detection officers: TSA screeners trained to pick out suspicious or anomalous behavior in passengers. There are about 3,000 of these officers working at some 161 airports across the United States, all part of a four-year-old program called Screening Passengers by Observation Technique (SPOT), which is designed to identify people who could pose a threat to airline passengers.

It remains unclear what the officers found anomalous about George’s behavior, and why he was detained ... But the incident has brought renewed attention to a burgeoning controversy: is it possible to know whether people are being deceptive, or planning hostile acts, just by observing them?²¹

Let us return, then, to the question of whether the face today is a surface whose identity can be traced back to the taxonomy of expression and emotion that Darwin initiated in 1872. We have suggested that contemporary bioinformatic regimes for drawing out the face as a fluctuating surface of micro-expressions, especially via the codification system designed by Ekman and Friesen, extends the Darwinian trajectory for locating truth and identity in the face. Importantly, the enmeshing of media technologies—initially photography but now facial-recognition software—with a science of facial expression shows how we are not dealing simply with the human face but rather

21 Sharon Wienberger, ‘Airport security: Intent to deceive?’, *Scientific American*, 26 May 2010, www.scientificamerican.com/article.cfm?id=airport-security-intent-to-deceive.

a machine of facialisation. We have also suggested, however, that such a machine only makes sense, indeed is itself expressive, through its relations with social and political machines. Today we are in the grip of a face whose identity has been entirely abstracted from and by the technical speeds *and* the biopolitics in which it participates. What matters in this new regime are issues of signal, distortion and clarity and what measures, techniques and technologies are to be devised and deployed to produce this common operating picture. The common operating picture to be discovered in the face today is precisely the operation of the (moving) picture.

This text is taken from *Imaging Identity: Media, memory and portraiture in the digital age*, edited by Melinda Hinkson, published 2016 by ANU Press, The Australian National University, Canberra, Australia.