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“The Psychology of the Smile in Georges Dumas: A Photographic Study”

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In 1887, Georges Dumas met the pioneer of French psychology Théodule Ribot, who encouraged him to study medicine after graduating in philosophy. According to him, the psychologist should be able to carry out “the medical examination” as well as the psychological one.[[1]](#footnote-1) This advice revealed his support to the pathological method, a particular trend of the experimental psychology developed in France. Following physiologists such as Claude Bernard, Ribot, Dumas and others considered pathological states as a kind of natural experimentation that revealed the normal functioning of the body and the mind. This approach especially materialised during the 1880s in the experiments on hypnosis that Jean-Martin Charcot carried out at La Salpêtrière, which marked a whole generation of psychologists such as Charles Féré and Alfred Binet. Most of them abandoned the research on hypnosis from the 1890s, but the influence of this pathological perspective pervaded later works. It became the prominent characteristic of French psychology and what differentiated it from the experimental psychology carried out by Wilhelm Wundt in Germany, who was more interested in the study of consciousness under ‘normal’ states, and William James in the United States.[[2]](#footnote-2)

Dumas became a prominent supporter of pathological psychology, applying and developing its methods throughout his work. He specialised in the study of emotions, publishing works on sadness and joy (1900), general overviews in his “Traité de psychologie” (1923–1924) and the “Nouveau Traité de psychologie” (1930–1947), and the compilation “La vie affective” (1948).[[3]](#footnote-3) This article will examine his less known work on the smile in “Le sourire” (1906) and a series of articles published in 1905.[[4]](#footnote-4) In this research, Dumas demarcated the limits between physiology and psychology while following the pathological method. In this regard, he started with the study of the physiology and the nervous pathology of the smile – the basis for the study of the social uses of the smile, which became the object of study of Dumas’ psychology.

Interestingly, “Le sourire” was fully illustrated with photographs, just as the rest of his work on emotional expressions. While this photographic material has been mainly ignored by most of the scholarship,[[5]](#footnote-5) I argue that the analysis of the uses, origins and circulation of these photographs enlightens key aspects of pathological psychology – and hence, of French psychology. Tracing the origins and diverse uses of the photographs included in Dumas’ work will demonstrate the circulation of knowledge among disciplines and French institutions. Moreover, the fact that most of these photographs belong to the chapters dedicated to the physiology and the pathology of the smile reveals the different roles played by photography in the making of knowledge in these three fields.

This article will first examine previous uses of photography in the psychology of the smile, focusing on Charles Darwin and Duchenne de Boulogne’s works, as well as the main criticisms that Dumas addressed to both of them. Then, I will explore the use of photography at the Clinique des Maladies Mentales in Sainte-Anne, the multiple origins of the photographic documentation used in “Le sourire” and, finally, the particularities of photography in relation to graphic inscriptions. These analyses will demonstrate the necessity to think about photographic practices in order to fully understand the genealogy of psychology in France, as they bring to light the strategies through which psychologists appropriated other disciplines’ discoveries, experiments and instruments to their own purposes.

Why the smile?

Dumas was not the first to illustrate the study of the psychology of the smile with photographs. Piderit, Duchenne de Boulogne, Charles Darwin and Wilhelm Wundt had already established the main physiological principles and muscles involved in the production of the smile by 1905, and some of them had used photographs with this purpose.[[6]](#footnote-6)

The first one was Duchenne de Boulogne, who experimented with localised faradisation to determine the muscles that expressed the passions of the soul. In this regard, he concluded that the function of the *zygomatic major* and the *orbicularis oculi* was the production of the expression of joy (Figure 2). The photographs that reproduced these experiments were intended to prove that only the contraction of these muscles produced a true smile. Darwin included some of these photographs in his *The Expression of Emotion in Man an Animals* (1872), in which he explained laughter and the expression of smile according to his law of association of serviceable habits. For him, the smile was a reminiscence of the act of uttering loud sounds which accompanied pleasurable experiences.[[7]](#footnote-7) Besides these images, Darwin also reproduced two photographs by the artistic photographer Oscar Rejlander and one by Dr George Wallich, a medical doctor turned into a studio photographer (Figure 1). In contrast to Duchenne, Darwin was not interested in producing smiles during experiments, but in capturing the naturalness of expressions. This is why he gave more prominence to instantaneous photographs taken in the studio.[[8]](#footnote-8)

Dumas followed Duchenne’s style in some of his photographs, although, in line with Darwin, his aim was the study of natural expressions. However, he criticised Darwin’s law of serviceable habits because, according to him, it unjustifiably multiplied the historical hypotheses of the transmission of expressions, which could be acknowledged by mere physiological principles.[[9]](#footnote-9) Likewise, he challenged Duchenne’s proposal of the ‘expressive muscles’. For Dumas, the smile was a reflex act produced by the excitation of the facial nerves and muscles, which could not be isolated. Therefore, it did not have any meaning by itself – it only obeyed to the mechanical laws. The smile could have indeed been completely different if the facial muscles and nerves would have been differently organised.

In this way, Dumas separated the pure physiology of the smile from its psychology. For him, he psychological question was to figure out how and why “we have turned a mechanical fact, a discharge reflex, into the most social of our gestures”[[10]](#footnote-10), which he identified as the voluntary smile. The psychology of feelings that he proposed addressed therefore the problem of how a purely mechanical act had become an *expression*: a voluntary gesture with particular social connotations. With this aim, Dumas explored first the physiology and the pathology of the smile.

Photography in Sainte-Anne

Dumas carried out experiments on faradisation to show that Duchenne’s theory was wrong. In particular, he wanted to dismantle Duchenne’s argument according to which the faradisation of a nervous branch produced a ‘grimace’ – a nonsensical expression.[[11]](#footnote-11) With this aim, Dumas collaborated with Dr Maurice Dupont, head of the laboratory of electricity in Sainte-Anne, to demonstrate that the electrical excitation of the facial nerve alone provoked the smile. “Le sourire” included four photographs of this series, the best they had achieved.[[12]](#footnote-12) Like in Duchenne’s case, photography played a major role in these experiments. Dupont recognised that “[w]e first used galvanic current of 3 miliamperes, but the contractions were intermittent. Therefore we have had to use faradic current to provoke a permanent excitation, and a contraction likely to be reproduced by photography.”[[13]](#footnote-13)

The photographic technology utilised by Dumas determined, therefore, the kind of electrical current that they could use, as well as the results that they could get. In this regard, reproducing expressions through photography was not merely a way to disseminate the results through visual means, but made part of the experiment just as the electrical machine. In particular, the shutter’s speed, the exposure time and the sensitivity of the plates determined what was a ‘permanent’ contraction.[[14]](#footnote-14) Likewise, these photographic material conditions prevented the reproduction of weak expressions, what made Dumas and Dupont to gradually increase the power of the excitation – but not too much, as the application of too high current would diffuse the expression.[[15]](#footnote-15) The experiment depended, therefore, on the dynamics between the ability of photography to capture the expression, and that of the electrical current to produce it.

Among the different photographs taken and published, the one reproduced in figure 3 displays which was, for Dumas, the most marked and natural smile. It showed a patient admitted in Sainte-Anne, identified as “Marie” in “Le sourire” and “La vie affective”, but as “Louise, age 32” in the article “Le sourie (1)”.[[16]](#footnote-16) Dumas also included another reproduction of the same photograph in which the side of the face that had not been electrified was covered by a black mask. This visual strategy, which had been already used by Duchenne, accentuated the effect of the expression. It allowed the reader to focus on the excited muscles, completing the expression in his imagination.

This and the rest of the photographs were intended to demonstrate “theoretically and practically” Dumas’ theory that “the expression of smile is pure mechanics, resulting from a light excitement of the motor nerves of the face.”[[17]](#footnote-17) He was, however, aware of the poor results of the representations. They lacked the pleasure and grace of natural smiles, as these qualities were difficult to replicate by artificial means. Following Darwin, Dumas observed that natural expressions were fleeting instantaneous movements that occasionally escaped the camera. Moreover, as he repeated many times in his books, smiling was an act involving not only the mouth but also “the cheeks, the nose, the eyes, the forehead and the ears”[[18]](#footnote-18), and even the whole body. The complexity of this dynamics accounts for the difficulty in artificially reproducing a ‘complete’, natural smile.

Dumas justified his photographs arguing that they did not have to reproduce natural smiles, but just the smile’s “outline”.[[19]](#footnote-19) This “outline” referred to the manifestation of the mechanism identified by Dumas – “when the excitation of the facial nerve propagates into the temporal-facial and cervical-facial branches, and it is light, it only affects the muscles of the smile, leaving indifferent the rest of them.”[[20]](#footnote-20) The concept of the “outline” supported Dumas’ work but also, and more important for our concerns here, gave the viewers instructions to read the photographs. They were not supposed to look at the images as if these were portraits of the patients, with their particular facial features, names and medical conditions. The photographic images were not self-evident, but had to be decoded by the readers. In this regard, Dumas insisted that they should focus on the dynamics between the muscles contracted and relaxed, and the relation between them and the exact point that the electrode had excited. Therefore, photography became in this context a tool that not only made visible what was invisible to the naked eye –the facial nerve-, but also fixed in a permanent image the otherwise fleeting contractions.

Dumas also used photographs of patients admitted in Sainte-Anne for his study of nervous pathologies of the smile. Figure 4 shows Justine, a nurse working with Prof Joffroy at the Clinique de maladies mentales. She suffered from peripheral paralysis of the left side of the face after a rock had cut her facial nerve off when she was four years old.[[21]](#footnote-21) Once again, Dumas published both the original photograph and a manipulation in which a black mask covered the right side of the nurse’s face. By hiding the healthy side, Dumas sought to stress the visual effects of the paralysis: “the distension of the muscles, the lowering of the fleshy part of the face, the extension of the paralysed part, the lowering of the corners of the lips, the reduction of the size of the nose, the apparent enlargement of the ocular globe, etc.”[[22]](#footnote-22)

According to the pathological method, the analysis of facial paralysis was equivalent to the analysis of the nerve at rest and the lowering of the muscular tonus. The photograph of the nurse Justine showed that this repose provoked the atony of the muscles, the opposite reaction to the excitation of the facial nerve. This expression was that of sadness: precisely the opposite emotion related to the smile, the joy. The study of nervous pathologies confirmed his theory on the physiology of the smile, and the photographs provided visual evidences of this. Readers could compare the ‘outline’ of the mouth and other facial features in the photographs to see that sadness was expressed through the opposite movement than the smile. With this aim, he used eight more photographs, including four that had not been taken in Sainte-Anne and which will be examined in the next section. At this point, Dumas’ explanations were still bounded to the physiological aspects of the smile, a necessary step upon which the psychology would be built.

Photographic Exchanges

Dumas borrowed some of his photographs from Joseph-Jules Dejerine, a prestigious neurologist and psychiatrist working at La Salpêtrière (Figures 5 and 6).[[23]](#footnote-23) Although he is better known for his research on aphasia, Dejerine also dedicated part of his study to the semiology of nervous diseases and mobility disorders. In this context, he examined diverse types of paralysis, including hemiplegia – the partial or complete loss of mobility of one side of the body.

The photograph of a female patient aged 27 reproduced in figure 5 aimed to demonstrate that, contrary to common belief, hemiplegia affected the upper facial nerve as well as the lower facial nerve, although to a less degree. Dejerine explained that “in this photograph, taken five days after the hemiplegia attack, we can see very clearly that the upper facial nerve is paralysed. The left eye is, effectively, more open that the right and the left eyebrow is higher than the healthy one.”[[24]](#footnote-24)

As part of his research on the nervous pathologies of the smile, Dumas completed the description of the symptoms, adding that the left eyelid was bigger, and that the curve of the eyebrow was attenuated by the paralysis, ending close to the orbicular side.[[25]](#footnote-25) He used this photograph to show that the signs provoked by the atony of the facial muscles in subjects affected by hemiplegia corresponded, as in the previous example, to the expression of sadness. For its turn, Dumas argued that the maniac excitation increased the tonus of the muscles, provoking a contraction that imitated the smiling expression. This was the case of the patient portrayed in the figure 6, a forty-one years old man suffering from hemiplegic contracture in the right side of this body.[[26]](#footnote-26)

These photographs are interesting for several reasons. First, as I have said at the end of the previous section, the images demonstrated that the same results achieved by the faradisation of the peripheral muscles experimented earlier at Sainte-Anne could be found naturally in a subject affected by pathological nervous disorders.[[27]](#footnote-27) They showed that two opposite pathological conditions (the lowering and the increasing of the muscular tonus) provoked two opposite expressions (that of sadness and the smile, respectively). This fact confirmed Dumas’ physiological theory of the smile and thereby validated his use of the pathological method to demonstrate it.

Second, these photographs attest the exchange of knowledge between scientists from different disciplines and institutions at this time. These two photographs, as well as the rest of the pictures that illustrated Dejerine’s “Sémiologie”, had been taken in the two hospitals where he had worked: La Salpêtrière and Bicêtre. Both institutions had in fact their own photographic services: La Salpêtrière had a long photographic tradition, started by Duchenne de Boulogne and consolidated by Charcot’s team, and Bicêtre began to use this technology upon the arrival of Bourneville in 1879.[[28]](#footnote-28) In spite of belonging to different hospitals specialised in different pathologies (hysteria and children’s mental disorders respectively), both photographs relied upon the same visual rhetoric. In line with the style developed in the clinical observation, the camera focused on the symptoms relevant to the study – in this case, the facial muscles and nerves – leaving out of the frame the body parts that were not medically interesting. The black background helped the reader not to get distracted, and differentiated these photographs from the portraits taken in commercial studios. Dumas appropriated this style in his photographs taken in Sainte-Anne, using in addition the black masks that helped to direct the viewer’s attention.

Dejerine’s photographs were reproduced in “Le sourire” without any modifications. Dumas respected the size of the photographs and the (poor) quality of the images. However, figures 5 and 6 served to build different knowledge in each context. While in Dejerine’s works they provided a better understanding of nervous diseases, in Dumas’ case they proved the physiological correlation between nervous excitement and the smile. The images were the same, but the scientific meaning of the photographs had changed because of its circulation and the relation to other photographs and texts in the book. This suggests that, for Dumas, images alone were not able to build any knowledge: it was the context in which photographs were used what created the conditions to generate it.

Something similar happened in the case of figure 7. Taken by Albert Londe in 1890 at La Salpêtrière and published in the “Nouvelle iconographie de la Salpêtrière” one year later, it showed a sixteen years-old woman suffering from hemifacial spasm.[[29]](#footnote-29) It made part of a series of observations on symptoms of organic diseases of the spinal cord that simulated hysterical symptoms. According to the doctor who treated her, Dr Souques, the woman portrayed in the photograph presented a complicated case in which hysteria was accompanied by partial cerebral atrophy.[[30]](#footnote-30) However, Dumas interpreted the picture as showing a hemifacial spasm “that we formerly called hysterical.”[[31]](#footnote-31) In this way, Dumas did not only separate himself from the (by then) old-fashioned theory of hysteria. He also resignified the photograph as a medical object, which abandoned the always suspicious realm of hysteria to enter into the mechanical physiology and psychology of emotions. As part of this medical resignification, the photograph also experienced physical changes. Figure 7 reproduces the photograph as published in the “Nouvelle iconographie”: a high quality picture of the upper body of a patient. As usual in this journal, the photograph occupied a whole page, and both the photographer (Albert Londe) and the photo-reproduction company (Photo-collographie Chêne & Longuet) were credited. However, Dumas cropped the photograph to focus on the face of the patient. In line with the rest of the photographs of the book, the image was intercalated in the text, reproduced in a very low quality and neither the photographer not the photo-reproduction company was named.

This modification is paradigmatic of Dumas’ consideration of photography. As in the case of the photographs taken at Saint Anne, the quality of the images was relegated to a secondary place because, for Dumas, photographs were not aesthetic objects. They were not valuable because of their visual properties, but were another laboratory tool which helped the reader to *see* in a very particular way. Reproducing photographs in his books helped Dumas to make the reader see only what was important for him: the ‘outline’, the dynamics of the contraction of the muscles. As far as this dynamics was visible, the photographs were useful, even if their visual quality was poor.

Besides these, “Le sourire” also included photographs taken by the psychologist Nicolas Vaschide at the Laboratoire de Psychologie Expérimentale de l’École des Hautes Études in the Villejuif asylum and by Albert Pitres, former student of Charcot and Dejerine and working in Bordeaux.[[32]](#footnote-32) These photographs, moreover, continued to circulate. The figures 3, 4, 5 and 6 reproduced in this article can also be found in the iconographic collection of Charles-Émile François-Franck, physiologist, collaborator of Étienne-Jules Marey and Chair of Natural History of Organised Bodies at the Collège de France. They ended up in this institution after Dumas’ widow legated his archives to the library – and this is probably the reason why these documents had been wrongly attributed to Dumas and Pierre Janet until recently.[[33]](#footnote-33) This collection includes albums as well as glass plates that François-Franck used during his lessons on the expression of emotions (1901–1902).

Although François-Franck does not appear in “Le sourire”, Dumas often mentioned him in his later works, praising the results he had achieved in human and animal physiology. Likewise, François-Frank’s notes reveal that Dumas inspired him in many ways. It is not surprising, therefore, that they shared their scientific material, including their photographs. The specific ways in which the photographs circulated is not, however, very clear. The figures included in this article are glass plates that reproduce the photographs as they appeared in Dumas’ books. However, Francois-Franck’s lesson on the expression of laughter took place in December 1901, some years before the publication of Dumas’ work, and it does not refer to these photographs. This suggests that the photographs were collected by Dumas, who exchanged this material with Francois-Franck after 1906.

The utilisation and re-utilisation of these photographs in different contexts contributes to trace and to understand the multiple origins of French psychology, which was formed by the dialogue between different disciplines –medicine, physiology, psychiatry and neurology. Focusing on the photographs allows, furthermore, mapping a series of institutions with laboratories of experimental psychology (La Salpêtrière, Sainte-Anne, Bicêtre, Villejuif and the Collège de France) where photography was practiced along with other instruments such as the pnemograph and vivisection techniques. Considering photography as a scientific instrument in the laboratory and the clinic not only offers a new perspective to examine the institutional set-up and cross-disciplinary relationships of the French pathological psychology tradition. It also reveals the ways in which photography contributed to the making of the physiology of emotions in the early twentieth century.

Photographs and other visual media

The physiology of emotions focused on the examination of the internal movements underwent by the subject, such as changes in pulse, breadth, and sweat. The observation of these “visceral emotions” was done through instruments such as the cardiograph, which produced measurable and quantifiable results.[[34]](#footnote-34) In this regard, expressions and gestures were studied inasmuch as they were the ‘external’ manifestations of ‘internal’ bodily processes related to affective states.

Dumas’ research on the smile can be read within this framework. In “La vie affective”, his latest work, he related the physiology of expressions with the psychology and physiology of the emotions that provoked them. In this regard, Dumas examined the physiology and pathology of the smile together with the physiology and psychology of joy. He explained both the smile and the joy as effects of the nervous excitation, whose opposite reaction was the depression of the nerves – sadness. The smile and the joy referred, therefore, to the same bodily process. However, their visualization was done through different means. While the smile was still examined through photographs of patients, the emotion of joy was measured through graphic inscriptions that showed changes in breath and pulse.[[35]](#footnote-35)

The difference between inscriptions and photographs did not lie, as it could be thought, in whether they represented the ‘outside’ or the ‘inside’ of the body. The previous sections have shown that Dumas used photographs not to describe the appearance of the expressions, but the surfacing internal working of the nerves and muscles. This was precisely the reason why he insisted on qualifying his experiments’ results as an ‘outline’ of the smile, and used black masks to hide the scientifically useless parts of the face. Although photographs did not provide data which could be directly measured – as the graphic inscriptions did-, they made visible the mechanical laws of physiology. Photographs and inscriptions were, therefore, tools adapted to their particular purposes which were not so different from each other.

Photography was indeed used in different ways depending on the object to research. While most of the pictures depicted patients, Dumas also examined photographs of children (figure 8), animals and masks, as well as paintings –many of them belonging to Francois-Franck’s collection.[[36]](#footnote-36) Regarding figure 8, Dumas explained that “[i]t’s a snapshot taken by chance. The camera that the father was using had problems to work precisely when the brood were laughing, but it suddenly re-established and caught the laughing children.”[[37]](#footnote-37) This photograph was used, together with others, to discuss the physiology of laughter, but also to make the distinction between the comical laughter and the laughter for pleasure. For Dumas, their psychological meaning differed, but the physiology was the same: a nervous discharge, which could refer to pleasure or to a difference at the level of affects. As in the case of the smile, the psychological problem was to find out why the expression of laughter had become a social sign. Again, he argued, “[t]he psychological causes of laughter could only produce it in accordance to his fundamental law – at the psycho-physiological origin of laughter there is a law of nervous mechanics.”[[38]](#footnote-38)

The problem commented at the beginning of this article remained: how men had turned a mechanical movement into a social expression. Through the case of the smile, Dumas had aimed to explore the physiological basis of the psychology of emotional expressions. As I have shown, the smile was, for him, a mere reflex act produced by the increase of the tonus. Dumas continued arguing that this moderated excitation was agreeable and that, by means of the association law, this physiological smile had become the sign of any social pleasure. As he put it, “we only need to imitate, through a voluntary movement, a reflex movement –and thereby we have transformed the reflex into a conventional sign”.[[39]](#footnote-39) He then discussed different problems related to this, such as the difference between the pleasure and the comic smiles. These explanations were still grounded on the physiological, but they excluded photography. This abandonment reinforces the thesis I have developed: photographs were intended to show, through the ‘outline’ of the expressions, the internal working of nerves and muscles. In this regard, they established the basis of the psychological study. However, they became useless to the study of the social interpretation of signs, which depended on criteria that these photographs were unable to show.

Conclusions

This case study illustrates the contribution that photographic history can make to the history of experimental psychology. Although Dumas like other renowned physiologists such as Marey and Angelo Mosso combined the use of the graphic method with photography, the role that photography has played in the physiology and psychology of emotions has mainly been overlooked. However, Dumas’ work has demonstrated that photography made integral part of early psychological research. Photographs were, for Dumas, laboratory tools that helped him to experiment with the physiology of the smile as well as to communicate and support his findings. They were visual aids, but the reader needed to know how to interpret them. Once and again, the photographs were not intended to show the faces of patients, but the ‘outline’ of their expressions. In this regard, they were more similar to graphic inscriptions than to any other figurative image. This is why they were adequate tools for the physiological study –the basis of experimental psychology- but not for the examination of purely psychological questions.

The circulation and uses of photographs examined in this article also suggest that there is a strong link between pathological psychology and photography that has not been fully explored yet. While the psychological laboratories attached to hospitals and asylums such as La Salpêtrière, Sainte-Anne, Bicêtre and Villejuif all integrated photography within their research methods, photography was not utilised in the only laboratory that focused on ‘normal’ psychology – the Laboratoire de psychologie physiologique at La Sorbonne, directed by Alfred Binet.

1. Georges Dumas, “Ribot”, *Revue philosophique de la France et l’étranger*, 128 (7/8), 1939, 5–16. [↑](#footnote-ref-1)
2. On the influence of hypnosis in French psychology see Regine Plas, “Psychology and psychical research in France around the end of the 19th century”, *History of the Human Sciences*, 2012, 25 (2) 91-107. For a comparative approach see Jacqueline Carroy and Henning Schmidgen, “Reaction time tests in Leipzig, Paris and Wurzburg. The Franco-German history of a psychological experiment, 1890-1910. *Medizinhistorisches Journal*, 2004, 39 (1), 27-55 [↑](#footnote-ref-2)
3. *La Tristesse et la joie* (Paris: Alcan, 1900), (Ed) *Traité de psychologie* (Paris: Alcan, 1923–24), (ed) *Nouveau traité de psychologie* (Paris: Alcan, 1930–1947). [↑](#footnote-ref-3)
4. Dumas, *Le sourire. Physiologie et psychologie* (Paris: Alcan, 1906); “Le sourire (1)”, “Le sourire (2)”, “Pathologie du sourire”, *Revue philosophique de la France et l’étranger*, 1905 [↑](#footnote-ref-4)
5. See for instance, Jacqueline Carroy, Annick Ohayon and Régine Plas, *Histoire de la psychologie en France. XIXe-XXe siècles* (Paris: La Découverte, 2006) and Serge Nicolas, *Histoire de la psychologie française. Naissance d’une nouvelle science* (Paris: In Press, 2002). [↑](#footnote-ref-5)
6. Dumas cited Piderit, *La Mimique et la physiognomie* (Paris: Alcan, 1888), Duchenne de Boulogne, *Mécanisme de la physiognomie humaine* (Paris: Baillère, 1862), Charles Darwin, *The Expression of Emotion in Man and Animals* (London: John Murray, 1872) and Wilhelm Wundt, *Élements de psychologie physiologique* (Paris: Alcan, 1886). [↑](#footnote-ref-6)
7. Darwin, *The expression of Emotions*, 211. [↑](#footnote-ref-7)
8. See Philip Prodger, *Darwin’s Camera. Art and Photography in the Theory of Evolution* (Oxford: Oxford University Press, 2009). I have developed this comparison further in Pichel, “From Facial Expressions to Bodily Gestures: Passions, Photography and Movement in French 19thC- Sciences”, *History of the Human Sciences*, December, 2015. [↑](#footnote-ref-8)
9. Dumas, *Le sourire*, 20. [↑](#footnote-ref-9)
10. Dumas, “Le sourire (2)”, 138. [↑](#footnote-ref-10)
11. Figure 6 Mécanisme, Dumas, op cit, 27. [↑](#footnote-ref-11)
12. “Le sourire (1)”, *Revue philosophique*, included two more photographs, Alice and Elise. [↑](#footnote-ref-12)
13. Ibid, 27. Footnote 1. [↑](#footnote-ref-13)
14. There is no information left regarding the photographic equipment used in this experiment, therefore we cannot know whether this was a second or less. [↑](#footnote-ref-14)
15. Ibid, 27. [↑](#footnote-ref-15)
16. “Le sourire (1), 14; *Le sourire*, 29. This is not the only case in which Dumas give different names to the same patient. [↑](#footnote-ref-16)
17. *Le sourire*, 31. [↑](#footnote-ref-17)
18. Dumas, *La vie affective*, 200. [↑](#footnote-ref-18)
19. Ibid, 29. [↑](#footnote-ref-19)
20. Ibid. [↑](#footnote-ref-20)
21. Ibid, 43. [↑](#footnote-ref-21)
22. Ibid. [↑](#footnote-ref-22)
23. Joseph-Jules Dejerine, *Semiologie du systeme nerveux*, 171 and 174. [↑](#footnote-ref-23)
24. Ibid, 171. [↑](#footnote-ref-24)
25. Dumas, *Le sourire*, 45. [↑](#footnote-ref-25)
26. Dumas had borrowed this photograph from Dejerine’s *Traite de pathologie general*, republished later in *Semiologie du systeme nerveux* p. 174. [↑](#footnote-ref-26)
27. Ibid, 47. [↑](#footnote-ref-27)
28. Bourneville had previously worked at La Salpêtrière, being the director of both *La Revue photographique des hôpitaux de Paris*, in 1869, and the famous *Iconographie photographique de La Salpêtrière*. See Marie-Rose Faure, “La photographie scientifique de Bournevile”, *Communication et langages*, 135, 2003, 104-124. [↑](#footnote-ref-28)
29. Souques, *Nouvelle iconographie de la Salpêtrière*, t.IV, 1891, p. 424. [↑](#footnote-ref-29)
30. Ibid, 429. [↑](#footnote-ref-30)
31. Dumas, *Le sourire*, 49. [↑](#footnote-ref-31)
32. Ibid, 39; 52. [↑](#footnote-ref-32)
33. Sarah Rey, “Les fonds François-Franck-Janet-Dumas. L’invention de la psychologie modern”, Salamandre, Collège de France. [↑](#footnote-ref-33)
34. See Otniel Dror, “Seeing the Blush: Feeling Emotions”, in Lorraine Daston & Elizabeth Lunbeck (eds), *Histories of Scientific Observation* (Chicago: University of Chicago Press, 2011). [↑](#footnote-ref-34)
35. Dumas, *La vie affective*, 99-100, 208-211. [↑](#footnote-ref-35)
36. Ibid, 290-295. [↑](#footnote-ref-36)
37. Ibid, 292. [↑](#footnote-ref-37)
38. Ibid, 314. [↑](#footnote-ref-38)
39. Dumas, “Le sourire”, 58. [↑](#footnote-ref-39)