

these differences are big or small, provisional or definitive, reducible or irreducible.”⁵⁹ In the next phase, scientists devise experimental setups in which the phenomena thus isolated can interact with one another so that their differences become sufficiently articulated. The more the scientists intervene, so Latour, the more they facilitate “the articulation of differences that make new phenomena visible in the cracks that distinguish them.”⁶⁰ In effect, the process of articulation of propositions comprises all experimental interventions that jointly enable the emergence of new scientific insights. I will use Latour's notion of the articulation of propositions as an analytical tool in my discussion of Charcot's image-based hysteria research.

In addition to the *Iconographie photographique*, my analysis will focus on Charcot's published clinical lectures on hysteria, as well as two studies of hypnosis he co-authored with his former pupil and collaborator, Paul Richer.⁶¹ My aim is not to provide an exhaustive analysis of Charcot's entire hysteria research. Rather, my focus will remain limited to analysing those particular instances of Charcot's research in which images enabled the production of new insights into hysteria. The first part of the chapter discusses the early nosographic stages of Charcot's hysteria research and delineates the constitutive role of photography and other visualisation techniques in constructing the Salpêtrian model of the hysterical attack. The second part charts how Charcot used both photography and Étienne-Jules Marey's graphic method to investigate hypnosis, which he regarded as an experimental model of hysteria. Finally, the third part examines how, using diagrams to map his patients' different sensory and motor symptoms, Charcot specified the nature of hysteria's underlying brain lesion and the potential mechanism of its formation. On the whole, this chapter traces the development of Charcot's research from its initial focus on the classification of hysteria's external manifestations to his subsequent attempts to define it as a disorder with a distinct brain-based pathogenesis. Throughout, I will delineate the epistemic functions that different types of images had at each stage.

1.1 Nosographic Stage: From Charcot's Early Lectures on Hysteria to Photography-Driven Mapping of the Hysterical Attack

In the winter of 1906, Pierre Janet delivered a series of celebrated lectures on hysteria at the Harvard Medical School. In the first of these lectures, Janet praised his former mentor Charcot for giving “precision to the clinical knowledge of hysteria” through his systematic research.⁶² But Janet also stated that Charcot had made “a

second attentive to first, and by making both of them diverge from their usual path, their usual interpretation.” Latour, “Well-Articulated Primatology,” 372 (emphasis in original).

59 Latour, *Pandora's Hope*, 141 (emphasis in original).

60 Latour, 143. Significantly, in Latour's view, research objects are not passive recipients of scientists' interventions. Instead, as much as the scientists who investigate them, the research objects actively participate in and decisively shape the research process. *Ibid.*, 140, fig. 4.3.

61 See Bourneville and Régnaud, *Iconographie photographique*, 3 vols.; Charcot, *Leçons du mardi*, 2 vols.; Charcot, *Oeuvres complètes*, 9 vols.; and Richer, *Études cliniques*.

62 Janet, *Major Symptoms*, 16.

certain number of regrettable errors” in his hysteria research.⁶³ One such error, according to Janet, was that Charcot had chosen the hysterical attack as the “the starting point” of his investigation into hysteria.⁶⁴ Janet emphasised that the hysterical attack was “a very variable and complex symptom” that comprised highly heterogeneous phenomena.⁶⁵ These included uncontrolled contractions of muscles, strange movements, and grimaces, as well as violent convulsions. Moreover, the attack entailed “very complicated states of consciousness.”⁶⁶ Janet argued that due to its inherent complexity, the hysterical attack should be studied at the end, not at the beginning of any systematic research into hysteria. Further, Janet suggested that by focusing on this symptom at the very outset of his research, Charcot uncritically followed a long medical tradition. In this tradition, hysteria was conceived as “above all, a convulsive illness whose most important symptom was the fit.”⁶⁷

Janet’s account, however, disregarded two significant aspects of Charcot’s early hysteria research. First, it omitted the fact that three of Charcot’s initial clinical lectures on hysteria did not explicitly deal with the hysterical attack. Instead, these lectures focused on other hysterical symptoms such as contractures, anaesthesia, and urine suppression.⁶⁸ Second, it appears to me that a factor other than the mere adherence to the medical tradition played a more substantial role in why Charcot soon shifted his focus to the study of the hysterical attack. I suggest that this shift from other symptoms to the hysterical attack was motivated primarily by the research method Charcot used. Specifically, although hysterical symptoms seemed to be “deprived of anatomical substratum,” Charcot nevertheless applied to their study the same clinico-anatomical method he had successfully used to investigate other neurological disorders.⁶⁹ This meant that, especially in the initial nosographic stage of his hysteria research, Charcot gave primacy to systematic clinical observation of the outward manifestations of the disorder. In my opinion, the hysterical attack was particularly suited to this kind of research. But to clarify this point, we need to take a closer look at the central tenets of Charcot’s nosographic approach.

During the nosographic stage, Charcot aimed to identify salient clinical features of the symptoms under study and to uncover the rules that determined their specific character. The basic assumption underpinning Charcot’s entire neurological research was that all pathological phenomena were attributable to “more or less profound modifications of physiological conditions” that characterised the normal state.⁷⁰

63 Janet, 17.

64 Janet, 22. Janet’s criticism of what he designated as Charcot’s physiological determinism and other related errors will be discussed in section 2.1.2.

65 Janet, *Major Symptoms*, 22.

66 Janet, 22–23.

67 Janet, 22.

68 See Charcot, “Lecture 9: Hysterical Ischuria”; Charcot, “Lecture 10: Hysterical Hemianaesthesia”; and Charcot, “Lecture 12: Hysterical Contracture.”

69 Charcot, “Lecture 1: Introductory,” 12.

70 Charcot and Richer, “L’hypnotisme chez les hystériques,” 310.

Charcot argued that hysteria was no exception in this respect.⁷¹ Further, he contended that due to their fundamentally physiological nature, symptoms of all disorders, including hysteria, had to be determined by underlying regularities. These regularities, however, were not immediately apparent but instead remained hidden behind the chaotic variability of individual clinical cases. To establish a particular disorder as a distinct clinical entity, the physician had to determine its distinguishing underlying regularities and thus define its fundamental pathological type.⁷²

Such a pathological type had a distinctly empirical basis as it was synthesised from observations of numerous individual cases. Yet, at the same time, the type was selectively constructed by identifying those clinical features that, according to the physician's judgment, applied "generally to all [observed] cases" of a particular disorder.⁷³ As Charcot repeatedly emphasised, the type presented the clinical picture of a disorder's fully developed and thus 'perfect' or 'classic' form.⁷⁴ Although the pathological type itself never occurred in actual clinical practice, its purpose was twofold. On the one hand, the type served as a diagnostic tool, enabling the physician to recognise the disease across its main variations.⁷⁵ On the other hand, the construction of the type constituted the fundamental first step in the systematic investigation of any disorder.⁷⁶ Charcot insisted that only after delineating the type through the nosographic approach could the physician search for potential anatomical and physiological causes of the disorder in question.

Aiming to facilitate a nosographic delineation of hysteria, Charcot divided its heterogeneous manifestations into transient and permanent hysterical symptoms.⁷⁷ Transient symptoms had a limited duration and only appeared from time to time. This group comprised different forms of hysterical attacks. Permanent symptoms included anaesthesia (i.e., loss of sensibility to touch, heat, cold, or pain), disturbances of sight, taste, hearing, and smell, as well as mutism, contractures, paralysis, tremor, and fixed painful points that Charcot designated as hysterogenic zones.⁷⁸ The shared feature of these various permanent symptoms was that they persisted during the intervals in which the patient was free from hysterical attacks. The duration of permanent symptoms could vary from several days to several years. Their permanence was, therefore, defined in relative terms, or more specifically, in direct opposition to the paroxysmal nature of the hysterical attack. Moreover, many of the permanent symptoms, such as different forms of anaesthesia, tended not to "strike the eye at first" and required targeted clinical examination to be discovered.⁷⁹ By contrast, the

71 Charcot explicitly stated that hysteria could not be "governed by other physiological laws than the common" diseases. Charcot, "Lecture 1: Introductory," 13.

72 Charcot, *Leçons du mardi*, vol. 1, 2nd ed., 196.

73 Charcot, 265 (my translation).

74 See, e.g., Charcot, 137, 265, 270, 332.

75 See Charcot, "Lecture 1: Introductory," 13.

76 Charcot, 8–9.

77 See Tourette, *Traité clinique*, xiv.

78 See, e.g., Charcot, "Lecture 11: Ovarian Hyperaesthesia," 262. For a detailed overview of permanent symptoms, see Charcot and Marie, "Hysteria," 631–38.

79 Charcot, "Lecture 21: Brachial Monoplegia," 279.

hysterical attack was not only the most visible but also the visually most versatile symptom, characterised by extreme variations in its outward manifestations across individual patients.

Hence, I suggest that both the pronounced visual character and its considerable variability made the hysterical attack particularly suited to being studied by the nosographic method. In short, this symptom provided ample material for sustained clinical observation. Further, one of the basic principles of Charcot's nosographic approach was to first focus on analysing more complex clinical cases in order to establish their underlying type.⁸⁰ Only after delineating 'the most complete' type of the disorder, on the whole, did Charcot turn to studying its "more attenuated and rudimentary" forms.⁸¹ Throughout his subsequent lectures, Charcot repeatedly drew attention to the fact that convulsive attacks were absent in some cases of hysteria.⁸² Thus in Charcot's view, hysterical attacks were not an indispensable clinical characteristic of hysteria. Nevertheless, Charcot insisted that the cases in which convulsive seizures featured prominently were "unanimously recognised" as the "gravest type" of hysteria or, in other words, the clinically most complete manifestations of this disorder.⁸³ Patients who did not exhibit any hysterical attacks were regarded as less typical cases.⁸⁴

Drawing my analysis together, I argue that Charcot first used a few less complicated hysterical symptoms, such as contractures and urine retention, as a convenient entry point into hysteria, which represented a new topic of research for him. But then, following the requirements of his nosographic approach, after only a few lectures, he shifted his focus to the hysterical attack as the most complex and variable symptom of this disorder. However, as will become apparent from my analysis, Charcot and his team at first struggled with determining the underlying type of the hysterical attack. I further intend to show that the Salpêtrians started to make progress in their investigation of the hysterical attack only after they expanded the clinical observations by introducing experimental manipulation and targeted use of photography.

Across the following three sections, I will chart the trajectory from Charcot's initial examination of different manifestations of hysteria to his increased focus on establishing the fundamental type of the hysterical attack. I will argue that photography played a constitutive role in the emergence of Charcot's new nosographic model of the hysterical attack. Moreover, I will also demonstrate that the epistemic efficacy of photography hinged on the fact that, instead of being used in isolation, it was productively combined with other visualisation techniques. But before analysing his photography-based investigation of the hysterical attack, we will first examine Charcot's

80 See, e.g. Charcot, "Lecture 9: Hysterical Ischuria," 226–27; and Charcot, *Leçons du mardi*, vol. 1, 2nd ed., 196.

81 Charcot and Richer, "Cerebral Automatism," 2.

82 See, e.g., Charcot, "Lecture 7: Contracture of Traumatic Origin," 84; and Charcot, "Lecture 21: Brachial Monoplegia," 283.

83 Charcot, "Lecture 11: Ovarian Hyperaesthesia," 271.

84 See, e.g., Charcot, "Lecture 7: Contracture of Traumatic Origin," 84.

initial phase of hysteria research, which has so far been overlooked in the humanities-based context.

1.1.1 Charcot's Initial Hysteria Research: From Contractures to Hysterical Attacks

Charcot held his first clinical lecture on hysteria in June 1870.⁸⁵ After a two-year break, when he resumed his teaching in June 1872, Charcot returned to the topic of hysteria with four additional lectures.⁸⁶ These altogether five lectures predated the launching of the photography-based research into the hysterical attack for which the school of Salpêtrière would later become famous. Moreover, only the last two lectures focused explicitly on the hysterical attack.⁸⁷ At a superficial glance, Charcot's initial lectures on hysteria may appear insignificant compared to his later research into this disorder. Yet a closer examination of the lectures will reveal that this is not the case. Specifically, my motives for analysing these five lectures are threefold. First, I aim to outline the basic tenets that characterised Charcot's hysteria research from its outset and also informed his subsequent investigation of the hysterical attack. Second, I intend to point out the obstacles Charcot and his team faced in their initial attempt to construct the clinical picture of the hysterical attack. As I will suggest later, these obstacles made Charcot and his team turn to photography in an attempt to tame the hysterical attack. Third, I want to draw attention to various images Charcot used in the early stage of his hysteria research and foreground the epistemic functions he attributed to these images.

Charcot's first clinical lecture on hysteria dealt with a so-called permanent hysterical contracture, a symptom that could affect either a single or several of the patient's limbs simultaneously.⁸⁸ The symptom entailed abnormal posturing of the affected limbs due to exaggerated involuntary muscle activity. The result was an enduring muscular contraction that could remain unchanged for days, months or even years. During this entire period, patients were unable to use their affected limbs. To demonstrate the characteristic clinical features of this symptom, Charcot presented two female hysteria patients to his medical audience. Pointing to one patient, he stated that a hysterical contracture of the upper extremity often resulted in the fixed attitude of flexion, with the affected arm bent towards the body. On the example of the other patient, Charcot explained that contractures of the lower limb typically entailed a bending of the thigh and the leg and a downward extension of the foot. This involuntary twisting

85 See Charcot, "Lecture 12: Hysterical Contracture."

86 The two-year break in Charcot's teaching activity was caused by the Paris Commune and the Franco-Prussian War. For the four lectures on hysteria Charcot gave in 1872, see Charcot, "Lecture 9: Hysterical Ischuria"; Charcot, "Lecture 10: Hysterical Hemianaesthesia"; Charcot, "Lecture 11: Ovarian Hyperaesthesia"; and Charcot, "Lecture 13: Hystero-Epilepsy."

87 Charcot, "Lecture 11: Ovarian Hyperaesthesia"; and Charcot, "Lecture 13: Hystero-Epilepsy."

88 Charcot's designation of the hysterical contracture as permanent merely served to emphasise that it belonged to the group of permanent symptoms we discussed previously. See Charcot, "Lecture 12: Hysterical Contracture," 285. However, as we will see shortly, this by no means meant that the symptom could not suddenly cease to exist.

led to a peculiar posture that Charcot designated as the hysterical clubfoot.⁸⁹ Charcot emphasised that, in both patients, the twisted extremities exhibited pronounced rigidity and a notable absence of muscle atrophy, although the contracture in the first case had lasted for two and in the second for four years.

While listening to Charcot's explanation of the typical limb posturing and rigidity in hysterical contractures, the members of his audience were able to directly observe the features described by visually examining the presented patients' bodies. A year later, when the transcript of Charcot's lecture appeared in the medical journal *Revue photographique des hôpitaux de Paris*, the narrative description of hysterical contractures was accompanied by two photographs.⁹⁰ The photographs showed the two patients' contracted upper and lower limbs, respectively (fig. 1.1). These are the earliest examples of Charcot's use of photography I have come across. Even a mere glance at these images provides us with some interesting insights. Due to their evident technical and compositional quality, it is safe to assume that the images were made by an external professional photographer hired for this purpose. Moreover, several details in the background of the images suggest that, because of the low light sensitivity of the photographic material used, the patients had to be carried out into the hospital yard to be photographed in daylight.⁹¹

Figure 1.1. Two photographs of patients with hysterical contractures.
From: Charcot, "De la contracture hystérique," plates 25 and 26.



89 Charcot, 284.

90 See Charcot, "De la contracture hystérique." The *Revue photographique des hôpitaux de Paris* was the first journal on medical photography. The journal was founded in 1869 by A. de Montméja, an ophthalmologist and amateur photographer. See Hennepe, *Depicting Skin*, 136. In 1870, Charcot's assistant, Désiré-Magloire Bourneville, became the co-editor of the journal.

91 These details include blurred, dark shapes behind the patient's head in the first image and the cobblestones in the upper region of the second image. See fig. 1.1.

But beyond their visual appearance, these two images are particularly significant for our discussion because they allow us to assess the function of photography in the early stage of Charcot's hysteria research. Specifically, in its initial deployment at the Salpêtrière, the function of photography was far removed from the innovative exploratory ways in which, as I will argue in the following section, Charcot and his team would use this medium only a few years later. At this early point, photography merely served to document the external features of the symptoms Charcot described in his lecture, thus making them available for visual demonstration in the absence of actual patients. In other words, the images published in the *Revue photographique* were not meant to produce any new medical insights into hysterical contractures. Instead, their intended purpose was to visually supplement Charcot's verbal description by illustrating the "interesting peculiarities" of the symptom whose diagnosis had already been established.⁹²

By 1870, such use of photographs as visual records of the symptom of interest was by no means a novelty in the medical context, and it often served to aid the diagnosis of similar cases.⁹³ Yet, it should be emphasised that the two photographs of Charcot's patients with hysterical contractures published in the *Revue photographique* did not have any diagnostic value concerning the symptom they illustrated. What I mean by this is that, although they contained information about the typical posturing in hysterical contractures, a physician could not deploy these images as visual guidance to diagnose similar cases. To understand why this was the case, we must return to Charcot's lecture on the hysterical contracture.

As Charcot informed his medical audience, hysterical contractures, just like any other manifestation of hysteria, often closely resembled symptoms of various organic diseases for which a circumscribed lesion of the nervous system had been determined. He explained that permanent contractures entailing a similar or even identical rigid posturing of the limbs as in his two hysteria patients could also arise from an

92 Charcot, "Lecture 12: Hysterical Contracture," 283. Interestingly, when the lecture on hysterical contracture was later published in the first volume of Charcot's collected works, it was no longer illustrated by photographs. In the *Oeuvres complètes*, the lecture was accompanied by drawings made after the original photographs. See Charcot, *Oeuvres complètes*, 1:348, 357. The same drawings were also included in the English translation of Charcot's collected lectures. See Charcot, "Lecture 12: Hysterical Contracture," 284, 294. A possible reason for this might have been the technical limitations of the time—unlike drawings, photographs could not be incorporated into the body of the text but had to be printed as separate full-page plates. See, e.g., Charcot, *Oeuvres complètes*, vol. 9, plate 13.

93 For example, since the early 1850s, photography was deployed to record the facial expressions and bodily gestures of the insane to facilitate the diagnosis of various mental disorders. See, e.g., Gilman, *Seeing the Insane*, 164–91. For an overview of the early uses of photography to depict and classify skin diseases since the mid-1860s, see, e.g., Hennepe, *Depicting Skin*, 128–161. For a more general overview of the early uses of photography in the medical context, see Schmidt, *Anamorphotische Körper*, 7–55. Furthermore, the *Revue photographique des hôpitaux de Paris* was richly illustrated with photographic images of clinical cases from Parisian hospitals. In fact, in the late 1860s, unlike the Salpêtrière, the Hôpital Saint Louis already had a designated photographic atelier on its premises. See Hennepe, *Depicting Skin*, 136.

organic lesion located either in the spinal cord or the brain.⁹⁴ This meant that by visually inspecting the external features of the patients' permanent contractures—or photographs thereof—a physician was unable to obtain an unequivocal diagnosis. In short, based on the appearance of the contracture alone, a physician could not discern whether this symptom was attributable to hysteria or caused by a circumscribed anatomical lesion of the nervous system. Hence, the inability of photography to serve as a diagnostic tool in cases of hysterical contractures was not a consequence of some potential deficiency of the medium. Instead, the problem lay in the nature of the symptom.

Yet Charcot declared that, despite the similarity to its organic counterparts, the hysterical contracture was simple to diagnose if one knew how to look for its distinctive features.⁹⁵ First, he emphasised that whereas contractures caused by an organic lesion developed slowly and gradually, those of hysterical origin appeared “suddenly, and without a transition.”⁹⁶ He also pointed out that hysterical contractures could just as suddenly disappear, especially after a patient had experienced a strong emotion or a stressful event.⁹⁷ Second, Charcot underscored the importance of measuring the extent to which the physiological functionality of the affected limb was preserved by using electrical stimulation. He stated that exposure to electricity elicited significantly diminished muscular responses in patients with organic lesions.⁹⁸ By contrast, patients with hysterical contractures demonstrated nearly normal contractility of muscles when submitted to the same test.⁹⁹ Third, Charcot highlighted the diagnostic significance of chloroform-induced sleep.¹⁰⁰ Once the patients were fully sedated, their hysterical contractures temporarily resolved only to return as soon they regained consciousness. The same intervention did not affect contractures caused by organic lesions.

By delineating these distinctive clinical features of hysterical contractures, Charcot effectively defined the symptom's underlying type. But perhaps even more significantly, his first lecture on hysteria drove home the message that a physician could not rely on “the mere superficial observation” of the symptom's external manifestations when diagnosing this elusive disorder.¹⁰¹ Instead, to avoid potential misdiagnosis, the physician had to carefully examine the symptom's temporal development and deploy multiple physiological tests and mutually complementary measurements. As we will see in the rest of this chapter, this approach continued to characterise Charcot's entire hysteria research.

94 Charcot, “Lecture 12: Hysterical Contracture,” 285–86. As Charcot specified in another lecture on hysteria from 1872, what he meant when referring to an organic or anatomical lesion was a structural pathological modification of the brain or spinal cord tissue caused by, e.g., “haemorrhage, softening, [or] tumours.” Charcot, “Lecture 10: Hysterical Hemianaesthesia,” 251.

95 Charcot, “Lecture 12: Hysterical Contracture,” 290.

96 Charcot, 289.

97 Charcot, 291.

98 Charcot, 298.

99 Charcot, 285.

100 See Charcot, 285, 298–99.

101 Charcot, “Lecture 1: Introductory,” 13.

However, as Charcot masterfully demonstrated in one of his subsequent lectures, even such meticulous clinical examination did not always suffice to reliably distinguish hysteria from other neurological disorders with similar symptoms.¹⁰² To demonstrate this difficulty, Charcot focused on hysterical hemianaesthesia, a frequent symptom of hysteria that had been addressed in the medical literature by several of his colleagues.¹⁰³ As Charcot elaborated in his 1872 lecture, hysterical hemianaesthesia entailed a loss of sensibility that affected an entire side of the patient's body, including the face. In most patients, the insensible zones ended precisely in the middle of the body as if cut off by a perfectly straight median line.¹⁰⁴ Apart from losing the sensibility to touch, many patients also had attenuated sensibility to pain, heat, and cold. Moreover, the organs of the senses were often additionally affected on the anaesthetic side of the body, thus leading to multiple concurrent disturbances of sight, hearing, smell, and taste.¹⁰⁵ Charcot's colleagues regarded hemianaesthesia as a symptom specific to hysteria "inasmuch as it is not found with the same characteristics in the immense majority of cases of material lesions" of the brain.¹⁰⁶ In his initial lecture on hysteria, Charcot also espoused this view.¹⁰⁷ But by 1872, he emphatically disagreed with it.

Voicing his disagreement with his colleagues, Charcot declared that "certain circumscribed cerebral lesions" could produce hemianaesthesia "with all the signs that characterize it in hysteria—or very nearly all."¹⁰⁸ His claim, Charcot explained, was based on the data he obtained by applying the anatomo-clinical method to his patients. He additionally drew on four clinical cases the Austrian neurologist Ludwig Türck had reported in 1859.¹⁰⁹ To substantiate his claim, Charcot launched a detailed discussion on the emerging insights into the cerebral localisation of sensory and motor functions. He began by summarising different views on the possible anatomical localisation of the nervous centres in which "sensitive impressions are transformed into sensations."¹¹⁰ According to Charcot's summary, the proponents of the "French theory," whose most famous representative was Alfred Vulpian, placed this centre not "in the brain proper" but lower down in the brainstem.¹¹¹ In contrast, the two major proponents of the 'British theory,' the physician Robert B. Todd and the physiologist William Carpenter, argued that the centre of perception of tactile impressions was in the thalamus, a grey-matter structure located near the centre of the brain.¹¹²

102 See Charcot, "Lecture 10: Hysterical Hemianaesthesia."

103 See Charcot, 248.

104 Charcot, 248.

105 Charcot, 249.

106 Charcot, 251.

107 See Charcot, "Lecture 12: Hysterical Contracture," 287.

108 Charcot, "Lecture 10: Hysterical Hemianaesthesia," 251 (emphasis in original).

109 Charcot, 252–53.

110 Charcot, 254. In this context, sensation designated the awareness of the impression an external stimulus had made on the subject's sense organs. See, e.g., Carpenter, *Mental Physiology*, 148–49. As we will see later in the chapter, in his subsequent research, Charcot conjectured that not all sensations necessarily entered the subject's awareness and could thus remain unconscious. See section 1.3.2.

111 Charcot, "Lecture 10: Hysterical Hemianaesthesia," 254.

112 Charcot, 253.

Charcot conceded that the dispute remained unresolved “in the present state of the science.”¹¹³ Nevertheless, he sided with Todd’s and Carpenter’s view that the presumed centre of tactile impressions was localised within the cerebral hemispheres and not the brainstem. In fact, on post-mortem examinations of multiple patients who had developed a combination of one-sided paralysis and hemianaesthesia due to cerebral haemorrhage, Charcot repeatedly found a lesion of the thalamus.¹¹⁴ Charcot’s findings thus seemed to provide direct support for Todd’s and Carpenter’s conjectures about the location of the centre of tactile impressions by linking organic hemianaesthesia to structural damage of the thalamus. However, Charcot warned his audience against jumping to conclusions by emphasising that, in some clinical cases, even extensive damage to the thalamus was not necessarily “followed by any special disorder in the transmission of sensitive impressions.”¹¹⁵

Next, Charcot presented to his audience an anatomical drawing of a frontal cross-section of the brain (fig. 1.2). This “topographical map” showed the post-mortem findings the Austrian neurologist Ludwig Türck had made in four cases of hemianaesthesia caused by a brain haemorrhage.¹¹⁶ The drawing jointly displayed and thus visually summarised the anatomical locations of the complex structural cerebral lesions Türck had discovered separately in four different clinical cases. Even a cursory glance at this brain map disclosed that the lesions identified by Türck were not limited to the thalamus. Instead, they extended to various other brain regions. In addition to the thalamus, the affected areas included a part of the “corpus striatum, the superior portion of the capsula interna, the corresponding region of the radiating corona, and the adjacent white substance of the posterior lobe.”¹¹⁷

The conclusion Charcot drew from the topographical brain map was that “in the cerebral hemispheres, there exists a complex region, lesion of which determines hemianaesthesia” of general sensibility.¹¹⁸ He also admitted that the knowledge about the precise limits of this region as well as the particular physiological function of its various parts was still scarce and tentative and, therefore, necessitated further anatomo-clinical research. Put differently, although the brain map failed to pinpoint “the fundamental lesion, to which the existence of the hemianaesthesia should be attributed,” it allowed Charcot to isolate “the region which requires investigation.”¹¹⁹

113 Charcot, 255.

114 Charcot, 253.

115 Charcot, 254.

116 Charcot, 255.

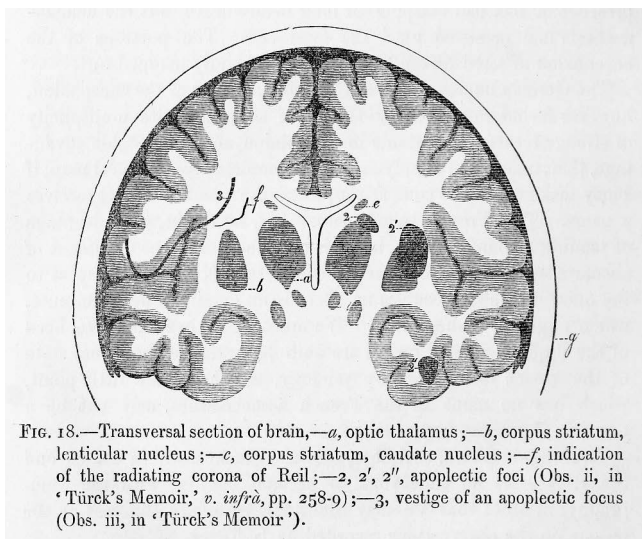
117 Charcot, 256. In this map, the affected portions of the brain were graphically highlighted either by black spots (designated as 2, 2' and 2'') or a black meandering line (designated as 3). See fig. 1.2.

118 Charcot, 257. Based on such continued post-mortem investigation of further clinical cases, Charcot subsequently claimed that none of the subcortical structures should “be looked upon as a centre for impressions of common and special sensation.” Charcot, *Lectures on Localisation*, 97. He suggested instead that the posterior part of the capsula interna and the corona radiata “merely represent a centre of passage or [sensory] cross-way, where the centripetal fibres in question are grouped together, before diverging towards the superficial parts of the cerebrum.” *Ibid.* In short, he later argued that the sensory centres must be localised in the brain cortex.

119 Charcot, “Lecture 10: Hysterical Hemianaesthesia,” 257.

Moreover, Charcot insisted that, based on his evidence about its potential structural neuroanatomical causes, hemianaesthesia could no longer be considered a symptom specific to hysteria. The fact that he could support his argument by presenting to his audience clinical findings visualised in the form of a topographical brain map must have considerably contributed to the persuasiveness of Charcot's position.

Figure 1.2. Diagrammatic drawing of a cross-section of a brain showing the anatomical locations of multiple structural lesions from four different cases of organic hemianaesthesia. From: Charcot, *Diseases of the Nervous System*, vol. 1, 256, fig. 18.



At a superficial glance, it may appear counterintuitive that at this early point of his engagement with hysteria, Charcot dedicated an entire lecture to deconstructing the diagnostic value of a symptom whose hysteria-specific nature seemed beyond doubt. Yet, I suggest that Charcot's deconstruction of hemianaesthesia as a "symptom proper to hysteria" was a strategic move motivated by two distinct aims.¹²⁰ First, by showing that particular organic brain lesions could also produce hemianaesthesia almost identical to the one that appeared in hysteria, Charcot made apparent the dangers of placing too much diagnostic importance on a single symptom. From this moment on, Charcot repeatedly insisted that, in hysteria, as in all other diseases of the nervous system, "no phenomenon, taken singly, can be truly characteristic. It is the mode of the grouping of the phenomena, their mode of evolution, concatenation," and their mutual relations that determined the unique clinical picture of each disorder and thus established its "nosographic distinctions."¹²¹

120 Charcot, 250.

121 Charcot, "Lecture 19: On Post-Hemiplegic Hemichorea," 277.

Hence, according to Charcot, to diagnose hysteria reliably, it did not suffice to identify salient clinical features of a single symptom. Instead, the physician had to meticulously examine the patient looking for a constellation of multiple concurrent symptoms characteristic of this disorder. For instance, Charcot argued that hysterical hemianaesthesia was typically accompanied by additional motor disturbances on the affected body side (e.g., contractures and motor weakness). Even more characteristically, the simultaneous presence of circumscribed zones of increased sensibility to touch and pain (i.e., hyperaesthesia) was often found on the otherwise anaesthetic side of the hysteria patient's body.¹²² Charcot insisted that only if such a specific "union of symptoms" could be found was there little doubt that the disorder in question was indeed hysteria.¹²³

Second, by showing that a structural cerebral lesion could also produce the clinical characteristics of hysterical anaesthesia, Charcot aimed to at least indirectly link hysteria to a distinct brain dysfunction. Years later, Charcot stated this explicitly by claiming that a physician should rely on the similarity in the clinical features between hysterical and organic symptoms to make inferences about their shared anatomical seat.¹²⁴ According to this line of reasoning, since organic and hysterical anaesthesia entailed a comparable loss of sensory function, they each had to be caused by some disturbance of the brain centre that presides over this function. In 1872, this linking of hysterical anaesthesia to a presumed functional disturbance of the brain centre in which "sensitive impressions are transformed into sensations" remained unspoken and thus only implicit.¹²⁵ But through his discussion of the French and British theories of cerebral localisation, Charcot already framed his approach to studying hysteria in unmistakably neurophysiological terms. He further reinforced this effect by showing his audience the map that visualised the brain lesions discovered in several cases of organic hemianaesthesia. Therefore, Charcot's lecture on hysterical hemianaesthesia had a critical strategic significance in setting up the conceptual framework for his subsequent hysteria research.

Another of Charcot's initial lectures on hysteria fulfilled a slightly different but, as I am about to show, no less significant strategic role. In this lecture, Charcot set out to prove that he could provide a physiological explanation for a rare hysterical symptom, whose very existence was "disputed by most physicians."¹²⁶ What is of particular interest to our discussions is that to achieve this goal, Charcot relied on images. The symptom in question was hysterical ischuria, or in lay terms, suppression of urine. The duration of this baffling symptom could vary from several days to several months. During this period, the hysteria patient secreted negligible daily amounts of

122 Charcot, "Lecture 10: Hysterical Hemianaesthesia," 247, 249–50.

123 Charcot, *Diseases of the Nervous System*, 2:277. In his subsequent lectures, Charcot sometimes drew attention to cases of monosymptomatic hysteria, in which a patient exhibited a "solitary hysterical symptom." Charcot, "Lecture 26: Hysterical Mutism," 371. However, he insisted that monosymptomatic hysteria was rare in clinical practice. In most cases, several symptoms occurred together in a characteristic unity. See Charcot and Marie, "Hysteria," 631.

124 Charcot, "Lecture 1: Introductory," 14.

125 Charcot, "Lecture 10: Hysterical Hemianaesthesia," 254.

126 Charcot, "Lecture 9: Hysterical Ischuria," 226.

urine without dying of sepsis or even manifesting any signs of deteriorating general health. Since this appeared physiologically impossible, patients with hysterical ischuria were summarily dismissed by physicians as simulators.¹²⁷ Yet, it came to Charcot's attention that one of his patients, who exhibited a diagnostically characteristic unity of multiple permanent symptoms of hysteria and thus appeared to be beyond the reproach of simulation, repeatedly suffered from prolonged periods of hysterical ischuria.¹²⁸ Intrigued, Charcot decided to submit her to systematic observation.

Charcot noticed that the onset of hysterical ischuria in this patient was typically supervened by daily vomiting. He also noticed that the daily vomiting persisted as long as the patient suffered from the suppression of urine. Drawing on these observations, Charcot instructed his assistants to separately and systematically collect both the patient's urine and the vomited matter on a daily basis, and to measure the respective quantity of each fluid.¹²⁹ The thus obtained numerical values were then plotted as individual data points on a single graph covering the period from July 16 to August 22, 1871 (fig. 1.3).¹³⁰ Finally, a separate line was drawn that connected the individual data points for each type of fluid. The blue curve stood for the patient's urine production and the red for the vomited matter. Each curve visualised the temporal fluctuation in the patient's daily production of the respective bodily fluid throughout the measurement period.

By visually examining and comparing the two curves, Charcot deduced that the quantity "of the vomiting generally rises when that of the urine falls."¹³¹ This, in turn, allowed him to conclude that there was an alternate "balance maintained between the results of these two phenomena."¹³² In other words, the novel insight revealed by the graph was that during hysterical ischuria, the patient's body compensated for the stoppage of urine by eliminating the waste products of metabolism through excessive vomiting.¹³³ The graph thus enabled Charcot to develop a plausible physiological

127 Charcot, 229–31. "[A]part from hysteria, suppression of urine if it but persists beyond a few days, say three, or four, or five, is an exceedingly serious symptom, which almost necessarily terminates in death." *Ibid.*, 231.

128 As Charcot explicitly emphasised, this was one of the two patients he had presented to his audience in his lecture on hysterical contractures in 1870. See Charcot, 235.

129 Since the patient was unable to urinate, to enable the measurement, her urine had to be withdrawn by a catheter on a daily basis. See Charcot, 227, 236. The quantity of her urine was measured in grammes and that of vomited matter in kilogrammes. See fig. 1.3.

130 In the French edition of Charcot's collected works, the lecture on hysterical ischuria was accompanied by two additional graphs produced by the same method in the autumn of 1871 and spring of 1872. See Charcot, *Oeuvres complètes*, 1:482–85. Since they merely reinforced the findings generated through the initial graph, I will not discuss them here. Interestingly, the English translation of Charcot's lecture on hysterical ischuria did not include any of these graphs. Nevertheless, Charcot's original references to the graphs were retained in the translation. The graphs were published four years later in the English translation of the second volume of Charcot's collected lectures. See Charcot, *Diseases of the Nervous System*, vol. 2, plates 5–7.

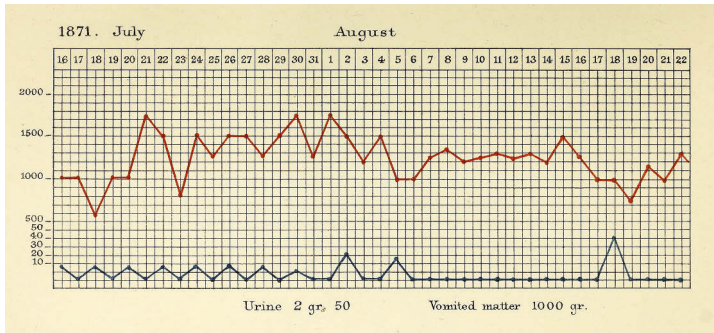
131 Charcot, "Lecture 9: Hysterical Ischuria," 236.

132 Charcot, 237.

133 This interpretation was further reinforced by additional laboratory data. Chemical analysis of the patient's vomit showed that it contained an unusually high level of urea, a waste product typically eliminated via the urine. A separate analysis showed that the hysteria patient had the same level

explanation for the perplexing fact that the patient had remained in good general health despite her months-long urine retention.

Figure 1.3. Line graph visualising the temporal changes in the quantities of urine and vomited matter in a patient with hysterical ischuria. The blue curve indicates the daily quantity of urine. The red curve designates the amount of vomited matter. From: Charcot, *Diseases of the Nervous System*, vol. 2, plate 5.



What I want to emphasise is the following. Charcot's ability to obtain this new insight into hysterical ischuria was a direct consequence of how he chose to visualise the daily changes in the respective quantities of the patient's bodily fluids. Admittedly, the operations of collecting, measuring, and visualising the patient's daily production of urine and vomit were already grounded in Charcot's proposition that these two physiological phenomena were somehow related.¹³⁴ Yet, the inverse correlation between the patient's urine production and vomiting was made articulable owing to the resulting line graph. Simply put, it was because the two separately collected datasets were visualised simultaneously within a single diagram that the underlying relationship between the two physiological processes became apparent. Moreover, it seems to me that in Charcot's use, the line graph fulfilled a dual function. On the one hand, Charcot deployed it as an effective epistemic tool to produce a novel insight into a highly contested hysterical symptom. On the other hand, by visually linking the symptom to the temporal changes in the production of bodily fluids, the graph also served as an indirect visual proof that hysterical ischuria had a distinctly physiological basis.

After successfully dealing with three challenging permanent symptoms of hysteria, in the last two clinical lectures he gave in 1872, Charcot turned to the hysterical attack as the most complex and dynamic manifestation of this elusive disorder.¹³⁵ However, as opposed to the innovative findings delivered in his first three lectures on hysteria, at this point, Charcot appeared to lack any groundbreaking new insights into the

of urea in the blood as a healthy individual. Hence, the level of waste products in her blood was not elevated. For details, see Charcot, 237.

134 I am using the term proposition here in Latour's sense. See Latour, *Pandora's Hope*, 141–44.

135 See Charcot, "Lecture 11: Ovarian Hyperaesthesia"; and Charcot, "Lecture 13: Hystero-Epilepsy."

hysterical attack he could impart to his audience. Instead, in his initial lectures on the hysterical attack, Charcot focused primarily on summarising and re-evaluating the views espoused by his predecessors. In doing so, he especially foregrounded the work of Pierre Briquet, a clinician of the previous generation, who in 1859 authored a 720-page study titled *Traité clinique et thérapeutique de l'hystérie*.¹³⁶ In this massive study, Briquet compiled and analysed 430 clinical cases of hysteria. Based on this analysis, Briquet concluded that hysteria was a functional disorder of the brain and that its heterogeneous symptoms, including the hysterical attack, were characterised by a law-like regularity.¹³⁷ The hysterical attack occupied a prominent place in Briquet's study, with more than a hundred pages dedicated to its description.¹³⁸

Generally speaking, Charcot's views on hysteria were aligned with Briquet's neurological definition of this disorder. Hence, Charcot often quoted Briquet in his lectures on hysteria.¹³⁹ Nevertheless, it should also be noted that, from the very start, Charcot disagreed with Briquet on several points. First, Briquet attributed hysteria in general and hysterical attacks in particular to a functional disturbance of "the portion of the brain that receives affective impressions."¹⁴⁰ In Briquet's definition, affective impressions were feelings of pleasure or pain induced by some external causes.¹⁴¹ But because his research predated the emergence of the paradigm of cerebral localisation, Briquet was unable to offer any details about the potential anatomical location of the purported 'affective' part of the brain. Similarly, Briquet was equally unable to specify which neurophysiological processes underpinned the hypothetical functional brain disturbance that, as he argued, caused hysteria. Tellingly, in his 1872 lectures, Charcot remained conspicuously silent about Briquet's conjectures that the seat of hysteria was located in some still unidentified part of the brain responsible for receiving affective impressions. Charcot's silence, it seems to me, indicated that he disagreed with Briquet on this point but, for the time being, had no alternative hypothesis he could present to his audience. In fact, we will see later in the chapter that in his subsequent research, Charcot gradually shifted further away from Briquet by developing a different, substantially more complex, and anatomically more specific conjecture regarding the potential locations of the functional brain disturbances underpinning hysteria.

Another, more explicit point of contention between Charcot and Briquet was the assumed relation between the so-called hysterogenic zones and the hysterical attack. In Charcot's designation, hysterogenic zones were anatomically circumscribed areas of permanently increased sensibility to pain. Their exact location varied from one individual to another since one or more hysterogenic zones could simultaneously occupy different regions of the hysteria patient's body. Notably, Charcot insisted that, in

136 See Briquet, *Traité clinique*.

137 See Briquet, 3–5.

138 See Briquet, 327–430.

139 See, e.g., Charcot, "Lecture 10: Hysterical Hemianaesthesia," 247, 250–51; Charcot, "Lecture 12: Hysterical Contracture," 283; Charcot, "Lecture 1: Introductory," 13.

140 Briquet, *Traité clinique*, 398, 600 (my translation).

141 Briquet, 600.

female patients, hysterogenic zones were frequently situated in the ovarian region.¹⁴² He claimed that the clinical importance of such fixed painful areas was not his discovery as it had been previously described in the medical literature by multiple other authors. Yet, Charcot also remarked that the notion of hysterogenic zones, especially in the ovarian region, had “gone out of fashion” because Briquet had denied their existence.¹⁴³

According to Charcot, however, by exerting targeted pressure on a hysterogenic zone and thus inducing a sharp pain in this oversensitive area, a physician could stop or modify a spontaneously occurring convulsive attack in a hysteria patient.¹⁴⁴ Just as importantly, through such intervention, the physician could also artificially induce an attack at his will.¹⁴⁵ This, in turn, allowed him to control the temporal course of the convulsive attack, thus facilitating its detailed clinical observation. Moreover, Charcot argued that the manipulation of the patients’ hysterogenic zones possessed a distinct diagnostic value.¹⁴⁶ He declared that the physician would fail to produce any effect whatsoever by pressing the ovaries of a patient undergoing an epileptic attack. Hence, by testing whether or not they reacted to the pressure applied to the ovaries and other hysterogenic zones, the physician could determine if convulsive patients were suffering from hysteria or epilepsy.

Such differentiation was of considerable clinical importance because hysterical attacks closely resembled epileptic convulsions. In fact, the resemblance was so pronounced that some of Charcot’s contemporaries posited the existence of a distinct disorder that was, purportedly, “a kind of hybrid composed half of hysteria and half of epilepsy.”¹⁴⁷ As Charcot noted, many physicians had such a hypothetical hybrid in mind when they used the term *hystero-epilepsy* to refer to patients’ convulsive attacks. Charcot vehemently opposed the existence of such a hybrid disorder. Instead, he sided with Briquet, who had claimed that despite the undeniable resemblance between hysterical convulsions and epileptic fits, the “nature of the hysteria” as a distinct disorder was beyond any question.¹⁴⁸ Drawing on Briquet, Charcot further emphasised that epilepsy and hysteria could co-exist in the same patient. Nevertheless, Charcot asserted that even in such mixed cases, convulsive fits caused by each of these two co-existing but mutually independent disorders remained “distinct and separate, without exercising influence over each other.”¹⁴⁹

142 Charcot, “Lecture 11: Ovarian Hyperaesthesia,” 263–69. At a later point, when his research expanded to include cases of male hysteria, Charcot insisted that in men, hysterogenic zones were often located in the regions of the testicles. See, e.g., Charcot, “Lecture 8: Contracture of Traumatic Origin,” 100; and Charcot, “Lecture 21: Brachial Monoplegia,” 286. For a discussion of various anatomical regions hysterogenic zones tended to most often occupy in male and female patients, see Charcot, “Lecture 6: On Hysteria in Boys,” 74–76.

143 Charcot, “Lecture 11: Ovarian Hyperaesthesia,” 264.

144 Charcot, 276. Charcot emphasised that this intervention was not his invention but had instead been practised in a similar form from the sixteenth century until it fell in disuse around the middle of the nineteenth century. *Ibid.*, 272–75.

145 Charcot, 271–72.

146 Charcot, “Lecture 13: Hystero-Epilepsy,” 306.

147 Charcot, 301.

148 Charcot, 302.

149 Charcot, 301.

Charcot also argued that distinguishing between these two types of convulsive fits had crucial prognostic consequences.¹⁵⁰ Repeated epileptic seizures typically resulted in the patient's gradual loss of intellect and could even end in death. None of these outcomes characterised hysterical attacks. But somewhat confusingly, despite having dedicated a significant portion of his lecture to foregrounding the clinical distinction between epileptic and hysterical attacks, Charcot nevertheless continued to use the term 'hystero-epileptic' throughout the 1870s to designate what he claimed were genuine hysterical attacks. As we will discuss in the following section, only after successfully establishing the symptom's underlying pathological type in the early 1880s did Charcot finally drop the designation 'hystero-epileptic' and rename the symptom into the 'major hysterical attack.'¹⁵¹

Notably, in 1872, Charcot's only genuinely innovative contribution to studying hysterical attacks was to deploy a diagnostic procedure he called the "thermometrical exploration."¹⁵² At the time, this fairly simple procedure was used at the Salpêtrière to investigate various disorders of the nervous system. It entailed a repeated measurement of the patients' body temperature. The aim was to determine if and how potential changes in the patient's temperature correlated with fluctuations in their symptoms.¹⁵³ Based on such measurements, Charcot and his colleagues concluded that no thermometric differences existed between patients who experienced either a single hysterical or a single epileptic attack. In both cases, the patient's temperature rose only slightly, reaching the upper limit of 38–38.5°C.¹⁵⁴ But the difference between the two disorders became evident in those exceptional cases in which a patient experienced multiple attacks in close succession to one another. Such a succession of hysterical or epileptic attacks was called *état de mal*.¹⁵⁵ Comparing the measurements obtained from multiple patients, Charcot discovered that in an epileptic *état de mal*, the patients' temperature rose quickly and dramatically, soon reaching 41°C. By contrast, in a hysterical *état de mal*, the patients' temperature hardly ever exceeded 38.5°C, and if so, then only in an "exceptional and transient manner."¹⁵⁶ As Charcot proudly emphasised, this differential thermometric characteristic presented a novel clinical finding that had "not hitherto been noted."¹⁵⁷ Unfortunately, the actual diagnostic value of this novel finding was limited since it applied only to rare cases of *état de mal*.

Charcot, however, was interested in generating more generalisable findings. Hence, in the next step, he turned to systematically observing convulsive fits of his hysteria patients, hoping to identify the attack's underlying fundamental type through his well-established nosographic approach. But challengingly, in most patients, the hysterical

150 Charcot, 306–7.

151 Charcot, "Lecture 3: Contractures of Traumatic Origin," 33.

152 Charcot, "Lecture 13: Hystero-Epilepsy," 307.

153 For details, see Bourneville, *Études thermométriques*.

154 Charcot, "Lecture 13: Hystero-Epilepsy," 307.

155 Charcot, 307. As Charcot emphasised, epileptic *état de mal* typically consisted of at least twenty to thirty fits a day. *Ibid.* By contrast, patients with hysterical *état de mal* could experience between 100 and 200 attacks a day. *Ibid.*, 311–12. In both cases, *état de mal* could extend over several days.

156 Charcot, 312.

157 Charcot, 307.

attack entailed a dynamic unfolding of dramatic movements in which all parts of their body appeared to partake simultaneously. In short, too much was happening at the same time. At first, such chaos of movements proved too elusive and too complex to lend itself to analysis through unaided observation. As Charcot admitted in a lecture he gave in 1888, in the early phase of his hysteria research, all that he could see while observing his patients' hysterical attacks was confusion.¹⁵⁸ In retrospect, Charcot suggested that he had initially failed to recognise any underlying regularity because, at the time, he still did not know how to look at the hysterical attack. After all, he mused years later, "to see what has not been seen before is a difficult and rare achievement in clinical medicine."¹⁵⁹

Yet, Charcot refused to be discouraged. Seeking to introduce some structure into his clinical observations of the hysterical attack, he decided, as he himself said, to "borrow" Briquet's general description of this symptom.¹⁶⁰ This choice was by no means accidental since, according to Briquet, hysterical attacks entailed a sequence of "fundamental phenomena" that always unfolded in the same order across different patients.¹⁶¹ At least in principle, Briquet's description thus appeared to fulfil the requirements of Charcot's fundamental nosographic type. Moreover, it is conceivable that Briquet's description particularly appealed to Charcot because it had been derived empirically from accumulated observations of numerous cases. However, whereas Briquet simply listed various fundamental phenomena in the sequence of their appearance, Charcot went a step further. Instead of merely borrowing his predecessor's original description, Charcot, in fact, adapted it. Charcot's intervention was twofold. First, he organised the heterogeneous phenomena listed by Briquet into three consecutive periods; and second, he gave each period a name.

In 1872, Charcot laid out this updated version of Briquet's description of the hysterical attack to his audience. He declared that before the actual hysterical attack started, the patient experienced a series of premonitory phenomena jointly referred to as the aura.¹⁶² The premonitory phenomena included a feeling of oppression in the stomach, palpitations of the heart, sensations of choking, and various disturbances of hearing and vision. The actual hysterical attack commenced with the period Charcot designated as epileptic. During this period, which resembled an epileptic attack, the patient lost consciousness and was seized by a tetanic rigidity of the limbs. The rigidity was sometimes followed by convulsions that were "brief in duration, and limited in oscillation."¹⁶³ The second, so-called clonic or convulsive period was characterised by violent contortions that affected the entire body. Moreover, while in the throes of the clonic period, some patients gave "utterance to strange words."¹⁶⁴ The attack ended with the third period, called delirium, which entailed sobbing, tears, and laughter.

158 Charcot, *Leçons du mardi*, 1:174.

159 Charcot, *Leçons du mardi*, vol. 1, 2nd ed., 123 (my translation).

160 Charcot, "Lecture 13: Hystero-Epilepsy," 304.

161 Briquet, *Traité clinique*, 397.

162 Charcot, "Lecture 13: Hystero-Epilepsy," 304–5.

163 Charcot, 305.

164 Charcot, "Lecture 11: Ovarian Hyperaesthesia," 277.

Next, Charcot presented five female patients to his audience and attempted to characterise the temporal unfolding of their hysterical attacks by applying the tripartite formula delineated above. However, if one carefully reads the transcript of the lecture, it becomes apparent that Charcot struggled to subsume the individual patient's attacks under his tripartite description. Admittedly, all five patients had in common the epileptic period of the attack. But the problem was that the subsequent stages of the attack differed substantially from patient to patient. Contrary to Charcot's descriptions, in some patients, violent convulsions were not confined to the clonic period but seemed to be scattered throughout the attack. Even more confusingly, three of the five patients had different types of deliria that failed to be contained within a single period. For example, in patients referred to as Marc— and Ler—, hallucinations and a “moody delirium” were limited to the convulsive period of the attack.¹⁶⁵ By contrast, Geneviève seemed to experience hallucinations during the purported third period of the attack, which Charcot termed delirium.¹⁶⁶ Charcot acknowledged these inconsistencies by stating that instead of succeeding each other regularly, the three periods of the attack tended to “get entangled, occasionally.”¹⁶⁷ But to express it in more explicit terms, when tested in a clinical context, Charcot's tripartite schematic description proved ineffective in helping the physician navigate the complexities of actual hysterical attacks.

In sum, after the novel insights delivered by his initial research into hysterical contractures, hemianaesthesia, and ischuria—in which different images played crucial epistemic functions—Charcot was at first unable to emulate this success once he shifted his attention to the hysterical attack. The tripartite description of the hysterical attack Charcot derived from Briquet failed to identify the symptom's underlying type. As my analysis has shown, neither were the three purported periods of the attack delineated with sufficient clarity, nor were their clinical characteristics unambiguously defined. When applied to actual clinical cases, this description turned out to be too vague and unspecific to fulfil Charcot's purposes. It could neither be used as a reliable diagnostic tool nor provide the basis for subsequent stages of the anatomo-clinical method. Yet despite this initial failure at deciphering the hysterical attack, Charcot was unwilling to concede defeat. Admittedly, from 1873 until the end of 1877, he held no further clinical lectures on hysteria.¹⁶⁸ Nevertheless, during this period, the Salpêtrien research into the hysterical attack intensified. And as the following section will show, this research soon took a new turn, which subsequently led to the emergence of a new four-stage model of the hysterical attack.

165 Charcot, 277. See also *ibid.*, 280–81.

166 Charcot, 278.

167 Charcot, “Lecture 13: Hystero-Epilepsy,” 305.

168 See Charcot, *Oeuvres complètes*, 1:387n1.

1.1.2 The Role of Photography in the Emergence of New Insights into the Hysterical Attack

With a lecture whose transcript was published in early 1878 in the *British Medical Journal*, Charcot resumed his clinical teaching on hysteria.¹⁶⁹ In this lecture, while focusing on another symptom, Charcot mentioned in passing that the hysterical attack “in its type of complete development” comprised four periods, which “succeed each other with remarkable regularity.”¹⁷⁰ Four years later, in the programmatic lecture that inaugurated his new professorship of diseases of the nervous system, Charcot returned to the topic of the hysterical attack’s fundamental type. By this time, he referred to this type as a well-established medical fact. Without going into details, he again stated that the type he now called the major hysterical attack consisted of “a very simple [four-stage] formula.”¹⁷¹ The first detailed description of the new type—including multiple schematic drawings of its main periods and phases—initially appeared in the doctoral thesis defended by Charcot’s assistant Paul Richer in 1879.¹⁷² After substantially expanding his doctoral thesis, in 1881, Richer published a 730-page study of *la grande hystérie* (i.e., major hysteria). Major hysteria was the new term Charcot introduced to designate the clinical cases characterised by a full-blown major hysterical attack. Hence, much of Richer’s study, titled *Études cliniques*, focused on the four-stage major hysterical attack.¹⁷³ The second edition of the *Études cliniques* appeared in 1885.¹⁷⁴ It contained new case studies and additional drawings, diagrams, and figures. Richer’s *Études cliniques* thus provided the definitive and most extensive account of Charcot’s four-stage hysterical attack in all its clinical variations.

Notably, neither Richer’s *Études cliniques* nor the lectures in which Charcot introduced the new formula of the hysterical attack contained any photographs.¹⁷⁵ Nevertheless, in what follows, I will argue that the innovative use of photography as an analytical tool at the Salpêtrière in the mid-to-late 1870s played a constitutive role in the emergence of new insights into the hysterical attack. Specifically, I intend to demonstrate that the articulation of the four-stage formula of the hysterical attack, whose details I will delineate at a later point, was a direct consequence of the photography-based exploration of this symptom.¹⁷⁶ With this aim in mind,

169 See Charcot, “Hysteric Chorea.”

170 Charcot, 251. The lecture did not deal with the hysterical attack but with a symptom called hysterical chorea. Hysterical chorea comprised involuntary, impulsive movements of the entire body, which, as Charcot had discovered, exhibited a remarkably rhythmical character. The female patient at the centre of this lecture had suddenly developed rhythmical chorea. Yet, as Charcot emphasised, this patient had also “for a long time been suffering” from hysterical attacks. *Ibid.*, 224.

171 Charcot, “Lecture 1: Introductory,” 13.

172 See Richer, *Étude descriptive*.

173 See Richer, *Études cliniques*, 1–526.

174 See Richer, *Études cliniques*, 2nd ed.

175 I will return to this point in the following section to suggest a possible explanation.

176 For the time being, it suffices for our discussion to note that a new four-stage type of the hysterical attack was established at the Salpêtrière in the late 1870s. In the following section, I will analyse the components of the four-stage type and the process of its construction. In the current section,

my discussion in the current section will focus on the output of the photography-based exploration of the hysterical attack published in the famous three-volume book *Iconographie photographique de la Salpêtrière*.¹⁷⁷

But at the outset of our discussion, it is important to emphasise that in his attempt to tame the chaotic hysterical attack with its complex movements affecting various parts of the patient's body, Charcot did not initially resort to photography. Instead, he used free-hand drawing to make what he referred to as sketches "from nature."¹⁷⁸ Judging from the sketches that accompanied one of his 1872 lectures, Charcot primarily focused on the most dramatic phases of the attack, during which patients simultaneously exhibited large-scale movements of several limbs (fig. 1.4).¹⁷⁹ Charcot's apparent aim was to isolate through sketching what he deemed salient aspects of such phases by visually fixing the patients' characteristic bodily postures and facial expressions.¹⁸⁰ However, since the speed of Charcot's pencil was no match for the swiftness with which the attack unfolded, we can safely assume that he drew such sketches at least partly from memory. By the time he finished drawing, the patient's body must have already occupied a different position.

The impression one gains when looking at his sketches 'from nature' is that Charcot was relatively apt at registering the patients' general postures and the relative positions of their limbs. At the same time, it appears that Charcot struggled with depicting the patients' fleeting facial expressions, rendering them as grotesque, undecipherable grimaces. Without much exaggeration, it can be said that Charcot's sketches from nature looked more like unintentional caricatures than accurate visualisations of clinical facts. Yet, in all fairness, Charcot's apparent struggles with capturing the details of his patients' facial expressions cannot be attributed merely to his limited sketching skills. The problems and ambiguities entailed in accurately observing and visually rendering dynamic facial expressions had already been emphasised by the neurologist Duchenne de Boulogne and the biologist Charles Darwin in their influential studies on this topic.¹⁸¹

Duchenne, who for a while had worked with Charcot at the Salpêtrière, argued that due to the transience of facial expressions, "it has not always been possible for even the greatest masters [i.e., artists] to grasp the sum total of all their distinctive features."¹⁸²

my focus is on the research that predated the emergence of this type and, as I will show, provided the fundamental basis for the type's formations.

177 See Bourneville and Regnard, *Iconographie photographique*, 3 vols.

178 Charcot, "Lecture 11: Ovarian Hyperaesthesia," 279.

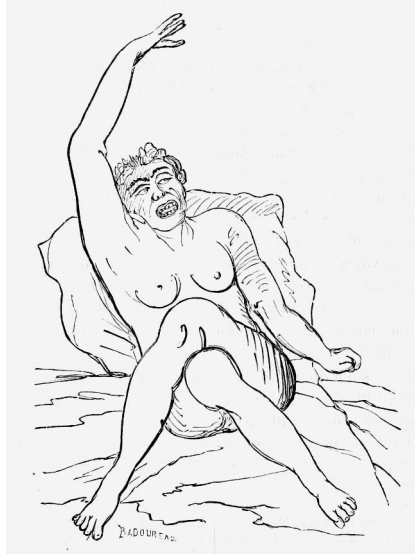
179 For another example of Charcot's sketch 'from nature,' see Charcot, 280, fig. 20. The published lecture also included a more elaborate drawing Richer made based on another of Charcot's sketches 'from nature.' See *ibid.*, 281, fig. 21. The two sketches and the drawing from Charcot's 1872 lecture were also published in the *Iconographie photographique*. See Bourneville and Regnard, *Iconographie photographique*, 1:17, 20–21.

180 Charcot's interest in capturing not just the patient's bodily posture but also her facial expression is indicated by the considerable detail with which he depicted her face. See fig. 1.4.

181 See Duchenne de Boulogne, *Facial Expression*; and Darwin, *Expression*. Duchenne's study was published in 1862. Darwin's study appeared a decade later and was influenced by Duchenne's. See Darwin, 5.

182 Duchenne de Boulogne, *Facial Expression*, 34.

Figure 1.4. Facsimile of Charcot's sketch 'from nature' of a patient during a hysterical attack. From: Bourneville and Regnard, *Iconographie photographique*, vol. 1, 17, fig. 1.



Darwin expressed a similar view: “The study of Expression is difficult, owing to the movements being often extremely slight, and of a fleeting nature. A difference may be clearly perceived, and yet it may be impossible, at least I have found it so, to state in what the difference consists.”¹⁸³ To capture the facial expressions with sufficient detail for their respective studies, both Duchenne and Darwin reverted to photography.¹⁸⁴

But despite its evident limitations, the practice of sketching hysterical attacks ‘from nature’ continued at the Salpêtrière and was, in the late 1870s, taken over by Paul Richer, Charcot’s student and later assistant.¹⁸⁵ Richer, who subsequently became a professor

183 Darwin, *Expression*, 13.

184 For a succinct analysis of the use of photography in Duchenne’s and Darwin’s respective studies of emotional expressions, see Pichel, “Passions, Photography, and Movement,” 30–35. See also Kemp, *Seen/Unseen*, 289–91. In his study, Darwin combined photographs from highly diverse sources. Some of the images depicted ‘natural’ (i.e., spontaneous), and others posed expressions of emotions. See, e.g., Darwin, *Expression*, 202–5. Duchenne, by contrast, chose a more uniform approach. He used electrical stimulation to artificially reproduce select emotional facial expressions in his experimental subjects and then deployed photography to document the results. See Duchenne de Boulogne, *Facial Expression*, 1. I will discuss Duchenne’s photographs of facial expressions in more detail later in this chapter when analysing Charcot’s hypnotic experiments. As we will see at that point, many of Charcot’s hypnotic experiments directly referenced Duchenne’s study of facial expressions.

185 For examples of Richer’s sketches ‘from nature’, see Comar, *Figures du corps*, 389–90.

of artistic anatomy at the École des Beaux-Arts in Paris,¹⁸⁶ proved to be considerably more skilful at drawing than Charcot. Unlike Charcot, Richer primarily used sketching to capture the patients' characteristic bodily postures during convulsions while paying comparatively little attention to their facial expressions. For example, in many of Richer's sketches, patients were shown in contorted postures with their faces hidden from view.¹⁸⁷ And even if visible, the patients' facial features in such rough sketches were drawn in a highly simplified manner, rendering them expressionless.¹⁸⁸ However, by the time Richer had joined Charcot's team, sketching 'from nature' was no longer used in isolation to study the hysterical attack. By that point, the Salpêtrians were also extensively deploying photography.

Inspired, as he claimed, by Charcot's use of sketching, yet apparently also aware of its limitations, Charcot's assistant Désiré-Magloire Bourneville came up with the idea to apply photography to the study of hysterical attacks.¹⁸⁹ The earliest dated photograph of a hysterical attack included in the *Iconographie photographique* stemmed from 1872.¹⁹⁰ Hence, we can presume that in 1872, Bourneville began to implement his idea. But at first, the transient nature of the attack proved to be an almost insurmountable problem. The problem was compounded by the fact that, initially, Bourneville had to rely on the services of external photographers, who often arrived too late to capture the hysterical attack.¹⁹¹ The problem was solved in 1875, when Paul Regnard, a medical doctor with knowledge of photography, became an intern at the Salpêtrière. In a joint project, Bourneville and Regnard began to systematically photograph hysterical attacks of several female patients. Charcot kept a watchful eye over their project.

Within less than a year, Bourneville and Regnard produced almost a hundred photographs of hysteria patients and patients with epilepsy.¹⁹² As explicitly stated by Bourneville, their endeavour might have stopped there. But Charcot encouraged them, first, to publish their clinical findings, and second, to focus on using photography to

186 See Comar, 478. Richer's subsequent career in fine arts and his visual depictions of the healthy body have recently become the focus of increased academic attention. See, e.g., Moser, "Körper & Objekte"; and Ruiz-Gomez, "Tyranny of the Cadaver." Interestingly, Richer, whose drawing talent was discovered by Charcot, did not have formal artistic training. See Ruiz-Gomez, 233.

187 See Comar, *Figures du corps*, 389, fig. 320.

188 See Comar, 390, fig. 321. The rough sketches I am discussing here were made at the patients' bedside to capture, as quickly as possible, the most salient aspects of the hysterical attack. It should be pointed out that, in addition to sketches 'from nature,' Richer also made other kinds of drawings. For instance, he made highly detailed drawings that were based on photographs taken of patients during the hysterical attack. See, e.g., Richer, *Études cliniques*, plate 2. For a photograph that evidently served as the source for this drawing, see Bourneville and Regnard, *Iconographie photographique*, vol. 2, plate 16. Moreover, Richer also made what I will later refer to as schematic drawings—simplified visualisations of the patients' typical postures and facial expressions from various phases of the hysterical attack. I will analyse Richer's schematic drawings of the hysterical attack in the following section.

189 Bourneville, "Préface," iii. It is safe to assume that Bourneville's decision to use photography was influenced by his experience as the co-editor of the *Revue photographique des hôpitaux de Paris*.

190 See Bourneville and Regnard, *Iconographie photographique*, 1:23.

191 Bourneville, "Préface," iii.

192 Bourneville, iv.

precisely classify various forms of the hysterical attack.¹⁹³ Following Charcot's advice, Bourneville and Regnard published the first volume of the *Iconographie photographique de la Salpêtrière* in 1877. This volume contained thirty-nine photographs of five hysteria patients in various stages of the attack.¹⁹⁴ A year later, the second volume followed, which in addition to the images of several epilepsy patients, contained twenty-nine photographs of four new clinical cases of 'major hysteria.'¹⁹⁵ By this time, a photographic studio had been added to Charcot's laboratories,¹⁹⁶ testifying to the increasing clinical importance of this medium at the Salpêtrière. Finally, in 1879–80, the third and final volume of the *Iconographie photographique* appeared. Apart from numerous images of hypnotic experiments, the third volume also contained six photographs of one patient's hysterical attacks.¹⁹⁷

In all three volumes of the *Iconographie photographique*, photographs of hysterical attacks were firmly embedded in protocols and organised into separate clinical case studies. After a short introduction into the patient's case history,¹⁹⁸ under the heading 'observation,' each protocol systematically charted multiple aspects of the individual's changing physiological states and externally observable behaviour. For instance, each patient's attacks were itemised chronologically and then described in their temporal development.¹⁹⁹ Throughout the protocols, the reader was repeatedly referred to the photographs of the attacks, which were explicitly designated as indispensable components of the symptom's accurate clinical description.²⁰⁰

The protocols also entailed extensive information about the patients' different physiological functions that were regularly monitored and quantified. These included the patients' temperature, pulse, acuity of the different senses (vision, hearing, taste, and smell), muscular strength, and the amount of various bodily fluids they produced (e.g., urine, vomit, saliva, and vaginal secretion).²⁰¹ Equal attention was paid to the onset and duration of the menstruation, as well as any changes in the patients' breathing, eating, and sleeping patterns.²⁰² Apart from systematically measuring the patients' physiological functions and photographing their attacks, Regnard and Bourneville also fastidiously documented the fluctuations of the patients' daily moods and the contents of their dreams.²⁰³ Even occasional fits of crying were carefully noted as a potential indication of the patient's upcoming hysterical attack.²⁰⁴ Moreover,

193 Bourneville, iv; and Bourneville and Regnard, *Iconographie photographique*, 1:158.

194 See Bourneville and Regnard, *Iconographie photographique*, vol. 1.

195 See Bourneville and Regnard, vol. 2.

196 See Bourneville and Regnard, vol. 2, ii.

197 See Bourneville and Regnard, vol. 3.

198 See, e.g., Bourneville and Regnard, 1:3–4, 14–15; and 2:187–90.

199 See, e.g., Bourneville and Regnard, 1:114–40; 2:192–96; and 3:7–24.

200 See, e.g., Bourneville and Regnard, 1:16–17.

201 See, e.g., Bourneville and Regnard, 1:117; 2:106, 128–29, 153; and 3:16, 24–25.

202 See, e.g., Bourneville and Regnard, 1:60, 88, 143; 2:107, 133, 166–67, 191; and 3:24–25.

203 See, e.g., Bourneville and Regnard, 1:52, 63, 65, 94; 2:102, 133, 189–90; and 3:23.

204 See, e.g., Bourneville and Regnard, 3:23.

Bourneville meticulously wrote down various verbal utterances that patients made during hysterical attacks while experiencing visual hallucinations.²⁰⁵

In line with Charcot's insistence on the unity of symptoms, the protocols catalogued if the patients experienced any changes in their concurrent physical manifestations of hysteria shortly before or immediately after each hysterical attack. Consequently, each attack was brought into relation to the appearance, worsening, or disappearance of the patients' concurrent hysterical symptoms, such as contractures, paralysis, tremors, ischuria, mutism, and various forms of anaesthesia.²⁰⁶ Finally, the use of photography was not limited to registering different phases of the patients' hysterical attacks. In other words, the patients were not only repeatedly photographed during their attacks. Instead, they were also photographed shortly before the onset of the attack, in the immediate aftermath of the attack, and in the so-called 'normal state.'²⁰⁷ The 'normal state' designated intervals between the attacks during which the patients were more or less symptom-free.²⁰⁸ All these heterogeneous clinical data were generated to systematically gather information about the hysterical attack and thus produce new insights into it.²⁰⁹

Importantly, according to the protocols, the Salpêtrians did not refrain from intervening in the course of the attack. They often applied pressure to the patients' ovaries and other hysterogenic zones, put them into straitjackets, or exposed them to electricity and various chemicals, such as ether, chloroform, and ethyl bromide.²¹⁰ All such manipulations were pedantically documented. Their shared aim was to stop, slow down, or sometimes even provoke a hysterical attack. In effect, it can be said that the patients were isolated from their everyday environment and regularly exposed to controlled interventions. Throughout, the temporal development of the patients' diverse symptoms was systematically registered by multiple instruments, including the photographic camera.

The proposition that consistently guided all the interventions listed above was the hypothesised existence of an underlying regularity hidden behind the surface variations of individual hysterical attacks.²¹¹ But where exactly this regularity lay and what it looked like remained open questions for a while. Hence, Charcot and his team kept addressing these questions by combining clinical observations and interventions, sketching, physiological measurements, and systematic photographing. Using the terms introduced by the historian of science Hans-Jörg Rheinberger, this setup can be fittingly designated as an experimental system, and the hysterical attack as its research

205 See, e.g., Bourneville and Regnard, 1:19, 37, 60, 66, 68–69, 74, 80–81, 83–86, 121, 135–36; 2:99–100, 104–5, 107–10, 139–40, 146–54, 195; and 3:8–14, 21.

206 See, e.g., Bourneville and Regnard, 1:62, 83, 93, 146–49; 2:119–22, 134–6; and 3:12.

207 See, e.g., Bourneville and Regnard, vol. 1, plates 14, 15, and 39; vol. 2, plates 15 and 31; and vol. 3, plate 6.

208 In all three volumes, the first image, which introduced each new clinical case, showed a patient in her 'normal state.' See Bourneville and Regnard, vol. 1, plates 1, 5, 10, 13, and 25; vol. 2, plates 11, 14 and 31; and vol. 3, plate 1.

209 Bourneville and Regnard, vol. 2, i.

210 See, e.g., Bourneville and Regnard, 1:174; 2:105, 108, 131; and 3:22.

211 I am using the term proposition here in Latour's sense. See Latour, *Pandora's Hope*, 141.

object, or in other words, the “epistemic thing.”²¹² Within this setup, together with sketching and measuring of various physiological functions, photography became one of the central “experimental conditions.”²¹³ Jointly, these experimental conditions were used as “vehicles for materializing questions” about the hysterical attack’s underlying type.²¹⁴

However, as pertinently emphasised by Rheinberger, “experimental conditions ‘contain’ the scientific objects in the double sense of this expression: they embed them, and through that very embracement, they restrict and constrain them.”²¹⁵ We have already discussed how through sketching, Charcot and Richer could register hysteria patients’ general postures during the most dramatic stages of the attack, yet failed to capture the details and nuances of the patients’ facial expressions. Similarly, photography—or, more specifically, the wet collodion process Regnard used²¹⁶—opened up new possibilities for studying the hysterical attack while, at the same time, also imposing its medium-specific limitations. One of the key advantages of the wet collodion process was its comparatively short average exposure time. Depending on the amount of light available, by the late 1870s, the average exposure time of this particular photographic method ranged from less than one second to several seconds.²¹⁷

Yet, the downside was that using the wet collodion process was cumbersome and complicated. Each time he took a photograph, Regnard first had to prepare a fresh glass plate by coating it with the light-sensitive material. He then placed the coated and still wet plate into the camera, exposed it, and developed it.²¹⁸ He had to perform these operations within fifteen minutes before the plate dried. Moreover, the cameras used for the wet collodion process did not yet have mechanic shutters. Hence, to make an exposure, Regnard had to manually remove the lens cap for the amount of time he judged adequate.²¹⁹ Determining optimal exposure times for different lighting conditions was not standardised and, therefore, required considerable experience, which the photographer could only obtain through a protracted process of trial and error.

The characteristics of the wet collodion process had several consequences for the Salpêtrians. First, a single hysterical attack lasted a quarter to half an hour on average.²²⁰ If we consider the time-consuming process needed to prepare each

212 Rheinberger, *History of Epistemic Things*, 28.

213 Rheinberger, 28.

214 Rheinberger, 28.

215 Rheinberger, 29.

216 Frederick Scott Archer introduced the wet collodion process in 1851. It became the dominant form of photography from the mid-1850s to the early 1880s, after which the gelatin dry plates process displaced it. See Hannavy, *Nineteenth-Century Photography*, 55–59.

217 See Hannavy, 516. By contrast, the average exposure times of the alternative photographic processes, such as Talbot’s collotypes and daguerreotypes, were in the range of several minutes. *Ibid.*

218 Importantly, contrary to daguerreotypes, the result of the wet collodion process was a photographic negative, which could then be used to print multiple paper copies. For details, see Hannavy, 1485–86.

219 See Hannavy, 516, 1486.

220 Richer, *Études cliniques*, 147.

photographic plate, it is evident that Regnard could not capture the temporal unfolding of an attack sequentially. Second, with the exposure times that ranged from less than one to several seconds, none of the resulting images was an instantaneous photograph. Third, due to the exposure times required, more dramatic aspects of the attack remained too elusive for the camera. Specifically, the wet collodion process could not register violent convulsions that consisted of large-amplitude movements simultaneously affecting the patient's limbs and the trunk. Similarly, the wet collodion process could also not capture small but rapid oscillatory movements that led to the generalised shaking of the patient's entire body.²²¹ Any attempt to photograph such movements would have necessarily resulted in an indistinct blur. The inevitable conclusion is that Bourneville and Regnard had to focus solely on the aspects of the attack that lasted long enough or were slow enough to be captured by the camera. However, in what follows, I will suggest that, far from being hampered by the apparent drawbacks of the wet collodion process, Bourneville and Regnard managed to turn them into an advantage.

The technical constraints listed above indicate that instead of being able to photograph the hysterical attack randomly, Bourneville and Regnard had to carefully choose which of the symptom's features to capture with the camera. We can thus presume that the challenges entailed in using the camera induced the Salpêtrians to search for and select those aspects of the attack that were not only 'photographable' in the technical sense but also potentially significant from the clinical perspective. Put simply, Bourneville and Regnard had to make active judgments about which of the temporal fragments of the attack to isolate as potentially epistemically promising. Therefore, I argue that the very insertion of the photographic camera into the context of the clinical observation started to change and structure how the Salpêtrians looked at the hysterical attack. It is important to keep in mind that, because of the exposure times required, the photographs did not disclose any features of the attack that were in themselves invisible to the naked eye. Nevertheless, I intend to show that both the act of photographing and the subsequent analysis of the resulting images jointly shifted the physicians' attention to the visual aspects, which had been previously overlooked in the complex temporal unfolding of the attack.

If one examines all the photographs of hysterical attacks published in the three volumes of the *Iconographie photographique*, what strikes the eye is that most images show either the patients' faces in isolation or their facial expressions combined with the attitudes of the upper body (fig. 1.5). By contrast, images showing how the patients'

221 Besides the continued use of sketching 'from nature,' Richer and Regnard also deployed Étienne-Jules Marey's graphic method to study those aspects of the hysterical attack that eluded the photographic camera. Specifically, they used the graphic method to examine the rhythm and amplitudes of patients' more dramatic convulsive movements by visualising them in the form of curves. See Richer, *Étude descriptive*, 27–45. Later in this chapter, I will analyse how Charcot and his team used Marey's graphic method in their hypnotic experiments. Yet, Richer's and Regnard's use of the graphic method to study the hysterical attack is not of interest to our discussion because the insights they thereby won did not contribute to the emergence of the four-stage model of the attack. For this reason, this segment of the Salpêtrian image-based research into the hysterical attack will be disregarded in what follows.

entire body partook in action, including their legs and feet, are conspicuously rare.²²² Moreover, even if a single photograph was taken from a greater distance to provide an overview of the patient's entire posture, it was typically followed by an image zooming in on the "attitude of the head" in the same posture (fig. 1.6).²²³ We have discussed previously how, due to their complexity, the exact details of the patients' facial expressions eluded both the unaided clinical observation and the attempts to capture them through sketching. A mere glance at the images compiled in the *Iconographie photographique* shows that the use of photography changed that. The exposure times of a few seconds or less proved short enough to allow Bourneville and Regnard to extract from the continuous flow of the attack those of the patients' facial expressions and accompanying gestures they had estimated to be potentially salient. Thus isolated, these somewhat extended moments became stabilised in the image and, in turn, made accessible to subsequent visual analysis.

Fixed in the form of two-dimensional photographic prints, such selectively isolated temporal fragments of the attack could now be studied meticulously. As I will discuss in more detail shortly, the images permitted the Salpêtrians to simultaneously scrutinise multiple aspects of the patient's facial features and gestures, thus discerning their potential relations. But just as importantly, it appears to me that photographing and analysing the resulting images were two mutually interconnected processes that dynamically and iteratively influenced each other. Put differently, it is conceivable that the process of looking at and analysing the photographs they had already made informed Bourneville's and Regnard's subsequent choices about which elements of the attack to continue photographing and how. Two aspects of Bourneville's and Regnard's practice support my conjecture. First, Bourneville and Regnard repeatedly cross-referenced similar images obtained by registering hysterical attacks of different patients.²²⁴ Second, as pointed out by the German art historian Susanne Holschbach, the formal and stylistic heterogeneity of the photographs gradually decreased across the three volumes of the *Iconographie photographique*.²²⁵ This visual development suggests that Bourneville and Regnard were progressively learning both how to look at the hysterical attack and how to photograph it. Hence, on the whole, it can be said that Bourneville and Regnard used photography as a highly productive analytical tool. Using this tool, they were able to generate novel empirical data about those transient aspects of the hysterical attack that, until that point, could not be explored in full detail.

However, I also want to emphasise that such explorative use of photography was coupled with novel semantic challenges. What I mean is that, especially in the early

222 See Bourneville and Regnard, *Iconographie photographique*, vol. 1, plates 6, 11, 37, and 38; vol. 2, plates 23, 26, and 29; and vol. 3, plate 3.

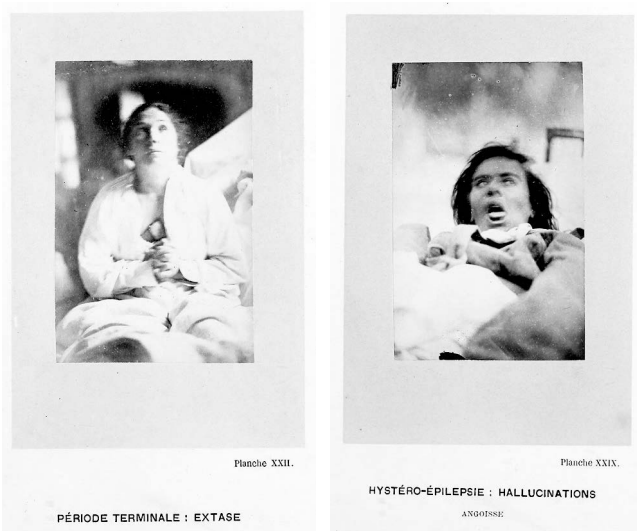
223 Due to the technical constraints discussed above (i.e., the need to prepare a fresh plate for each exposure), such pairs of images could not have been taken consecutively but only with some temporal delay between them. Alternatively, Regnard had to wait for the same patient to have another attack in which the same posture would occur again. This explains the differences in the positions of the patient's body across the two images in fig. 1.6. That both images nevertheless display the same posture is made clear by the accompanying captions.

224 See, e.g., Bourneville and Regnard, *Iconographie photographique*, 1:41.

225 See Holschbach, *Vom Ausdruck zur Pose*, 140–42.

stages of the research, the potential informational content of the resulting photographs was not immediately self-evident even to Bourneville and Regnard, who intentionally made these images. In other words, from the medical point of view, Regnard's images of the hysterical attack were distinctly different from the two photographs of hysterical contractures that accompanied the transcript of Charcot's first lecture on hysteria (see fig. 1.1). As discussed earlier, the two photographs of contractures illustrated a physical feature—i.e., the typical attitude of the limb—whose clinical meaning Charcot had established and described before the images were taken. Therefore, it was already clearly defined at the moment of their production what these two photographs were meant to show to other physicians. By contrast, I argue that what was to be seen in the photographic images of hysterical attacks at first remained ambiguous.

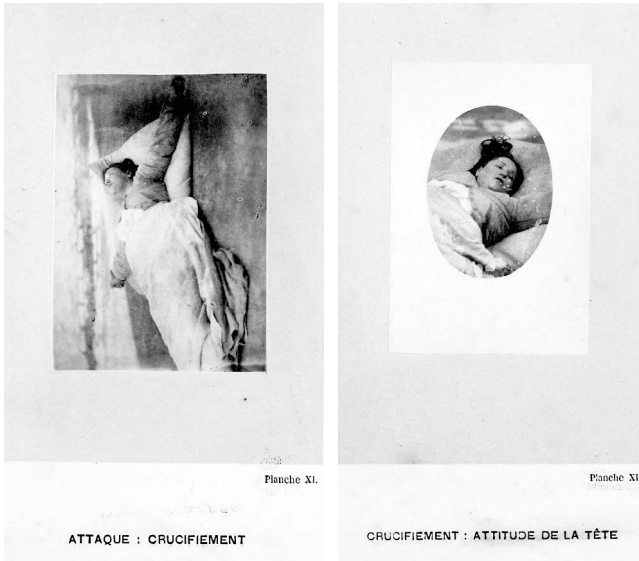
*Figure 1.5. Two photographs by Paul Regnard of patients during hysterical attacks. From: Bourneville and Regnard, *Iconographie photographique*, vol. 1, plates 22 and 29.*



My current statement may appear surprising since I have claimed above that Bourneville and Regnard used photography to intentionally isolate from the continuous flow of the hysterical attack precisely those temporal fragments they had deemed potentially salient. Yet, the point I am making here is that the actual epistemic and clinical significance of Bourneville's and Regnard's choices could only be determined through subsequent visual analysis of the resulting images. First, what initially remained unclear was how the isolated fragments related to the rest of the patient's hysterical attack. Especially in the early phase of the photography-based research, Bourneville somewhat vaguely designated the images as belonging to the first, second, or third phase of the attack, without providing any details about what constituted these

phases or how they were delineated.²²⁶ Second, and even more importantly, it was not immediately evident if the postures and facial expressions seen in the images were characteristic of the hysterical attack in general or merely represented idiosyncratic variations of a single patient.

Figure 1.6. Two photographs by Paul Regnard of a patient during hysterical attacks. From: Bourneville and Regnard, *Iconographie photographique*, vol. 1, plates 11 and 12.



To resolve such ambiguities and extract the information of interest about the typical manifestations of the hysterical attack from the photographs, the Salpêtrians developed a strategy for ‘reading’ these images. Put simply, they learnt how to “see in a unique inscription something general.”²²⁷ With this aim in mind, I argue, Charcot and his team started to visually compare photographic data they obtained by systematically registering recurring attacks of different patients. In the process, they focused on identifying across individual photographs the figurative features that were characteristic of the hysterical attack in general and thus constitutive of the attack’s underlying type.²²⁸ At the same time, Charcot and his team sought to disambiguate what they established as salient visual features of the attack from those aspects they deemed accidental, atypical, or idiosyncratic. Through such comparison, the Salpêtrians began to isolate and designate as ‘typical’ the bodily postures and facial expressions that

226 See, e.g., Bourneville and Regnard, *Iconographie photographique*, vol. 1, plates 2–4.

227 Krämer, “Operative Bildlichkeit,” 102.

228 See, e.g., Bourneville and Regnard, *Iconographie photographique*, 1:22, 36, 41, 44, 68–71, 96, 124–26, 131–33, 158; and 2:146, 154, 194, 201–2.

consistently repeated themselves not only across multiple attacks of a single patient but also across different patients.

A pertinent example of a 'typical' attitude that emerged through this visual analysis was the posture the Salpêtrians called the 'crucifixion.'²²⁹ This typical attitude was shown in seven photographs of four different patients in the first two volumes of the *Iconographie photographique*.²³⁰ The technical quality and the visual composition varied considerably across the images (figs. 1.6 and 1.7). Some of the photographs were overexposed and blurry. In some, the patients were apparently photographed in the hospital yard, whereas in others, they were shown inside the ward, lying in their beds. Not just the distance but also the angle from which we view the patient changes from image to image.²³¹ Yet, despite such formal inconsistencies, even a superficial visual comparison of the photographs made it easy to identify the shared features of the patients' postures. In all images, the entire body appeared stiff. The patient's arms were extended horizontally with wrists flexed and fingers curled into fists. The neck was stretched backwards, the facial features strained, the eyes open and directed upwards, the lips parted. These were the typical features that constituted the attitude of crucifixion. Conversely, in one of the seven images, the patient's eyes were closed. The Salpêtrians viewed this detail as an idiosyncratic variation that did not constitute the type.²³²

229 Another similar example was the attitude the Salpêtrians termed 'ecstasy,' which was shown in six photographs of three different patients. See Bourneville and Regnard, vol. 1, plates 22–24; and vol. 2, plates 22, 23, and 37.

230 See Bourneville and Regnard, vol. 1, plates 6, 7, 9, 11, and 12; and vol. 2, plates 25 and 36. My discussion here intentionally circumvents an iconographic analysis of these photographs in terms of their visual similarities to religious depictions of the crucifixion. This is because I want to distance myself from Didi-Huberman. By foregrounding such visual similarities, Didi-Huberman declared Regnard's photographs to be mere transfigurations of "religious iconography," or in other words, figurative fabrications that lacked any epistemic value. Didi-Huberman, *Invention of Hysteria*, 142. As I see it, however, merely pointing out the iconographic parallels between Regnard's photographs and the religious imagery does not provide sufficient evidence for the assumption that the hysteria patients at the Salpêtrière were induced by their physicians to imitate particular religious poses. We can equally assume that Charcot's patients, many of whom were intensely religious, spontaneously emulated affectively charged poses from religious images they had seen in churches and prayer books. In short, the iconographic features of Regnard's photographs can neither prove nor disprove either of these two mutually opposing assumptions and are, therefore, irrelevant to our discussion. For an incisive historical analysis of Bourneville's and Charcot's broader positivist, anticlerical agenda and the role their study of the hysterical attack had within this agenda that focused on demystifying religious miracles, see Goldstein, *Console and Classify*, 369–77.

231 Notably, the visual heterogeneity is pronounced across the five images from the first volume. By contrast, the two images of the crucifixion from the second volume are visually more uniform. See Bourneville and Regnard, *Iconographie photographique*, vol. 2, plates 25 and 36. It appears that, by this point, Regnard had succeeded in determining the optimal distance and the point of view from which to photograph this particular typical attitude.

232 For Bourneville's descriptions of the attitude of crucifixion, see Bourneville and Regnard, 1:22, 35; and 2:146.

*Figure 1.7. Two photographs by Paul Regnard of patients during hysterical attacks. From: Bourneville and Regnard, *Iconographie photographique*, vol. 1, plate 7; and vol. 2, plate 36.*



Moreover, according to the protocols, the attitude of crucifixion lasted in some patients only a few seconds. Other patients remained in this attitude for several hours.²³³ The Salpêtrians did not consider such substantial individual differences in the duration of this posture to be relevant. They focused instead on identifying the pattern of visual features that repeated themselves across multiple photographs. Crucially, this search for repetitive visual patterns meant that whether or not a particular photograph of a hysterical attack contained visual information about some salient aspect of the type could not be determined by looking at this photograph in isolation. Instead, the epistemic significance of every single photograph could only be identified through comparison with other photographs of different hysterical attacks. Hence, in this kind of visual analysis, individual patients were of interest only to the extent that they provided insights into the underlying type of the hysterical attack. At the same time, all idiosyncratic aspects of each patient's attacks were considered noise.

But the epistemic purpose of visually comparing numerous photographs was not limited to identifying the typical postures of the hysterical attack. Even more importantly, the visual analysis also enabled Charcot and his team to discover a previously unknown aspect of the hysterical attacks' temporal development. Specifically, I argue that by allowing the Salpêtrians to register the patients' fleeting facial expressions, which had thus far eluded them, photography for the first time made it possible to systematically investigate how the patients' emotional states changed during the hysterical attack. As discussed earlier, decades before the Salpêtrians launched

233 See Bourneville and Regnard, 1:44–45; and 2:163.

their research, Briquet had already claimed that emotions played a crucial role in the hysterical attack. However, in which phases of the attack emotions dominated and whether there was any regularity in how the patient's emotional states fluctuated throughout the attack remained open questions.

Photography appeared particularly well suited for addressing these questions, as it permitted the Salpêtrians to capture and analyse what they explicitly designated as the "objective" manifestations of their patients' emotional states.²³⁴ Under such 'objective' manifestations of emotion, Charcot and his team primarily understood the patients' facial expressions and the accompanying bodily gestures and postures. In my opinion, their use of photography to register external manifestations of emotions during the hysterical attack and their explicit designation of these manifestations as 'objective' indicate that the Salpêtrians were decisively influenced by Duchenne's and Darwin's studies of emotions. Admittedly, neither Duchenne nor Darwin was explicitly mentioned in the *Iconographie photographique*. Nevertheless, it appears to me that Duchenne's and Darwin's physiological studies of emotional expressions provided the implicit conceptual framework for the Salpêtrian study of the hysterical attack. First of all, Duchenne and Darwin viewed emotions as innate, biologically determined instinctual responses to external circumstances,²³⁵ a point of view to which, as we will see later, the Salpêtrians wholly subscribed. Moreover, in this framework, different emotions, such as joy, anger, or contempt, were conceptualised as discrete physiological states. Both Darwin and Duchenne contended that various discrete emotions were externally manifested through mutually distinct and universally recognisable facial expressions.²³⁶ As I am about to show, this premise crucially informed the Salpêtrian interpretation of the photographs of their patients' hysterical attacks.

Contrary to broader affective states of pain and pleasure with which Briquet operated in his descriptions of the hysterical attack,²³⁷ the Salpêtrians tacitly adopted Duchenne's and Darwin's division of emotions into distinct categories. This is evident in the fact that the Salpêtrians chose to classify the photographs of the hysteria patients' facial expressions and gestures according to the emotional categories that closely resembled Duchenne's and Darwin's respective catalogues of discrete emotions.²³⁸ The categories of discrete emotions the Salpêtrians used for this semantic transcription

234 Richer, *Études cliniques*, 94.

235 See Duchenne de Boulogne, *Facial Expression*, 22–31. See also Darwin, *Expression*, 13–18, 38–40, 69, 72–74.

236 It should be mentioned that Duchenne's and Darwin's views on emotional expressions did not completely overlap. For example, according to Darwin, emotional gestures, unlike facial expressions, were not entirely innate but at least in part influenced by cultural conventions. See, e.g., Darwin, *Expression*, 264–77. Moreover, unlike Duchenne, Darwin did not consider that all emotional states were revealed through fixed facial expressions. See Darwin, 262. For additional differences between Duchenne's and Darwin's views, see Kemp, *Seen/Unseen*, 289–91.

237 See Briquet, *Traité clinique*, 398, 600.

238 See Duchenne de Boulogne, *Facial Expression*, 26–29. See also Darwin, *Expression*, 147–309. It is conceivable that, during this process, the Salpêtrians relied on a direct visual comparison between the photographs of facial expressions and postures of their hysteria patients and Duchenne's photographs of discrete emotional categories. See Duchenne de Boulogne, *Facial Expression*, 213–21. This assumption is all the more likely since, as we will see in section 1.2.2, Charcot's

included ecstasy, melancholy, fear, surprise, disgust, contempt, disdain, lustfulness, menace, derision, aversion, and bliss.²³⁹

Through this transcription, a wide range of photographs in the *Iconographie photographique* were assigned captions or subcaptions that designated them as unambiguous manifestations of discrete emotional states, thus fixing their intended interpretation (see fig. 1.5). The captions were meant to direct future observers to look for the expression of a particular emotion in the facial features and gestures of the patient shown in the image. In effect, this transcription allowed the Salpêtrians to translate each patient's continuous hysterical attack into a sequence of discrete emotional states. It is worth noting that this semantic transcription would not have been possible based on the unaided observation of patients' bodily postures alone. Instead, it necessitated the systematic scrutiny of facial expressions that first had to be isolated and immobilised for this purpose with the aid of photography.²⁴⁰ But it equally necessitated the interpretational framework provided by Darwin's and Duchenne's theories of discrete emotions.

However, any broader epistemic usefulness of classifying the patients' photographs according to different categories of emotions was not immediately evident. This was because, at first, it remained unclear if there was any underlying regularity across diverse emotional states that different patients externally manifested through their facial expressions and gestures during the attack. To tackle this question, the Salpêtrians turned to analysing Regnard's photographs in conjunction with the written protocols Bourneville had kept of the various utterances hysteria patients made during their attacks. The combined analysis proved insightful. It revealed that the externally observable manifestations of emotions captured in the photographs closely correlated with the content of the hallucinations a particular patient was experiencing during the attack.²⁴¹

Yet even after the Salpêtrians made this finding, the underlying type of the hysterical attacks continued to elude them for a while since the hallucinations varied considerably from patient to patient. If anything, the difference among the patients seemed to predominate. During their hallucinations, some patients violently fought with imaginary enemies while their faces expressed terror or anger.²⁴² Others almost

subsequent hypnotic experiments were explicitly informed by Duchenne's photographs of discrete emotional categories.

239 See Bourneville and Regnard, *Iconographie photographique*, vol. 1, plates 19–24, 29–36; and vol. 2, plates 18–23, 26, 27, 37, and 38. I am using the term transcription in Ludwig Jäger's sense. As discussed in the introduction, Jäger introduced this term to designate the process of meaning attribution through the targeted establishment of references among signs, either within a single medium ("intramedial procedures") or across different media ("intermedial procedures"). See Jäger, "Transcriptivity Matters," 53–54.

240 As we will see later in this chapter, both the use of photography to capture the patients' facial expressions and the reference to Duchenne's experiments with facial expressions of emotions played crucial roles in Charcot's subsequent hypnotic experiments. See sections 1.2.1 and 1.2.2.

241 See, e.g., Bourneville and Regnard, *Iconographie photographique*, 1:63, 68, 133; and 2:172. See also Richer, *Études cliniques*, 94.

242 See Bourneville and Regnard, *Iconographie photographique*, 1:19, 126.

immediately sank into a melancholy delirium.²⁴³ Some began to enact passionate love scenes.²⁴⁴ In his analysis of the patients' attacks, Bourneville continued to apply the tripartite formula Charcot had derived from Briquet. Using this formula, he evidently struggled to identify any temporal pattern in how the emotional states, and the correlated hallucinations, fluctuated across different patients. For example, in some cases, he assigned the images of the patient's emotional manifestations to the second period of contortions.²⁴⁵ In other cases, he subsumed them under the third period of delirium.²⁴⁶ Sometimes he merely designated the images as expressions of hallucinations without specifying to which period of the attack they belonged.²⁴⁷ In fact, Bourneville seemed to face similar interpretational challenges as Charcot had in his 1872 lecture we discussed in the previous section. Despite these challenges, the photographing of the patients' emotional facial expressions and gestures continued. Moreover, Bourneville continued to analyse the resulting images by relating them to the protocols of the verbal utterances the patients made while hallucinating. Finally, he made two significant discoveries.

First, he noticed that the contents of the hallucinations the patients experienced during the hysterical attack were by no means random. He deduced instead that the hallucinations often incorporated recollections of emotionally charged experiences from the patients' past.²⁴⁸ In some cases, such experiences included various happy occurrences that, having made a particular impression on the patient, stood out in her memory. More often, the hallucinations revolved around adverse events, particularly those that had triggered the onset of the illness by causing the patient's first hysterical attack.²⁴⁹ Yet, regardless of whether the particular content was happy or sad, the key point was that the patients appeared to keep reliving the same fixed set of memories with each new attack.²⁵⁰ In other words, by transcriptively relating the photographs to the written protocols, Bourneville determined that, with each attack, a single patient always experienced the same violent emotions, which she repeatedly expressed through the same sequence of facial expressions, gestures, and utterances.²⁵¹ In short, Bourneville discovered that certain phases of the hysterical attack were characterised by the fixity of their emotional content.

Second, Bourneville additionally identified another type of hallucination. During this second type of hallucination, the patients were not transported into the distant past. Instead, they appeared to be preoccupied with memories of mildly unpleasant recent occurrences and daily impressions.²⁵² Even in a single patient, this latter type of

243 See Bourneville and Regnard, 1:69.

244 See Bourneville and Regnard, 1:74.

245 See Bourneville and Regnard, 2:193.

246 See Bourneville and Regnard, 1:124–25, 131–32.

247 See Bourneville and Regnard, 2:192.

248 See Bourneville and Regnard, 1:97, 99; and 2:167, 171.

249 See Bourneville and Regnard, 1:97, 157; and 2:170–72.

250 See Bourneville and Regnard, 1:99.

251 See Bourneville and Regnard, 1:69–71. See also *ibid.*, plates 22–24. I am using here the term 'transcriptively' in Jäger's sense. See Jäger, "Transcriptivity Matters," 53–54.

252 See Bourneville and Regnard, *Iconographie photographique*, 1:100, 156–57.

hallucination varied in its content from one attack to another, reflecting the patients' ongoing experiences. Consequently, the changing content each time induced different emotional states that, in turn, gave rise to highly variable facial expressions and gestures. The photographs, as Bourneville claimed, demonstrated these differences.²⁵³

Next, by building upon Bourneville's discovery, Richer conducted a series of experiments that allowed him to identify another distinction between the two types of hallucinations.²⁵⁴ He established that, during hallucinations related to the fixed events from their distant past, hysteria patients remained insensitive to external stimuli and, therefore, entirely unconscious of their environment. Conversely, during the other type of hallucinations, patients partly regained their consciousness and could, to some extent, perceive external stimuli.²⁵⁵ Hence, the two types of hallucinations differed not only in the kinds of memories that constituted their content but also in the physiological effects they induced in the patients. Taken together, these findings lent significant empirical support to Charcot's initial proposition that the seemingly chaotic hysterical attack was characterised by an underlying regularity.²⁵⁶

To sum up, my analysis in this section has shown that by using photography in conjunction with written protocols and targeted experimental manipulations, the Salpêtrians managed to articulate previously unknown features of the hysterical attack. The novel findings included the discovery of the characteristic facial expressions and bodily gestures that repeated themselves across multiple attacks of a single patient and across different patients. Perhaps even more importantly, by correlating images and written protocols, Bourneville managed to identify two different types of hallucinations that patients experienced during the hysterical attack. He thus delivered a significant new insight into the changing emotional dynamics of this elusive symptom.

On the whole, it can be said that, in the context of the Salpêtrian research on the hysterical attack in the late 1870s, the explorative use of photography created "an open reading frame for the emergence of unprecedented events."²⁵⁷ However, it is also important to emphasise that, having made the initial discoveries by analysing and comparing photographic data, written protocols, and various physiological measurements that stemmed from different patients, Bourneville stopped short of providing a synthesis of these findings. Throughout the *Iconographie photographique*, Bourneville's primary focus remained on the individual clinical cases. It was, therefore, left to Charcot and Richer to take the next step and synthesise the insights won through

253 See Bourneville and Regnard, 1:124–25, 133.

254 During these experiments, Richer exposed hysteria patients to various chemical substances and loud noises, blindfolded them, and pricked their skin. All these interventions were performed while the patients were experiencing hallucinations in the course of their hysterical attacks. See Richer, *Études cliniques*, 94–95.

255 For example, a patient could hear the noise but failed to determine its actual cause. Similarly, she could see her physicians but failed to recognise them. Richer, 129.

256 I am using the term proposition here in Latour's sense. See Latour, *Pandora's Hope*, 141–44.

257 Rheinberger, *History of Epistemic Things*, 31.

the photographic exploration of the hysterical attack. The result of their synthesis was a new four-stage model of the attack to whose discussion we will now turn.

1.1.3 Constructing the New Image-Based Model of the Hysterical Attack

In the introduction to the first edition of his *Études cliniques*, Richer stated that in 1878, Charcot “arrived at the notion of the major hysterical attack being composed of four periods.”²⁵⁸ In Richer's words, this notion was “so simple that it is astonishing it was not discovered earlier.”²⁵⁹ And whereas the basic tenets of the new model of the hysterical attack emerged in 1878, Charcot and Richer continued developing its various aspects until the mid-1880s. As I will show in what follows, it was only in the mid-1880s that Charcot and Richer created the definitive visualisation of the four-stage model of the hysterical attack, which they then instituted as a diagnostic tool. But first, I will underscore how Charcot constructed the new four-stage formula by transforming and expanding the old tripartite model he had initially adopted from Briquet.²⁶⁰ Importantly, although neither Charcot nor Richer explicitly mentioned this, I will argue that the reconfiguration of the old tripartite into the new four-stage model of the attack was a direct consequence of Bourneville's photography-based findings discussed above.

At this point, we need to remind ourselves that Charcot's initial tripartite model of the hysterical attack was composed of: first, the epileptoid period; second, the period of contortions; and third, the period of delirium. Conversely, in the new formula, “the complete attack” was divided into four distinct periods.²⁶¹ These periods comprised “1st, epileptoid; 2nd, great movements (struggling, purposeless); 3rd, passionate attitudes (purposive); [and] 4th, terminal delirium.”²⁶² Whereas the epileptoid period remained mostly unchanged across the two models, the major innovation consisted in the introduction of an entirely new period of ‘passionate attitudes.’ Charcot specifically devised this term to designate the period during which hysteria patients experienced emotionally charged hallucinations whose fixed content they enacted through gestures, facial expressions, and utterances that repeated themselves across each individual's different attacks.²⁶³ Throughout this period, the patients remained oblivious to their environment.²⁶⁴ In other words, the new category of passionate attitudes encompassed

258 Richer, *Études cliniques*, xii (my translation).

259 Richer, xii.

260 In this chapter, when referring to Charcot's four-stage model of the attack, I deploy the terms ‘formula’ and ‘model’ interchangeably. I use the term model in the sense introduced by Margaret Morrison—as an idealised structure that enables scientists to “represent and explain the behaviour of physical systems.” Morrison, “Autonomous Agents,” 39. Yet, Charcot often used the term ‘formula’ when referring to his four-stage model of the hysterical attack. See Charcot, “Lecture 1: Introductory,” 13. Hence, I use the term formula in reference to Charcot's deployment of this term.

261 Charcot, “Lecture 1: Introductory,” 13.

262 Charcot, 13.

263 See Richer, *Études cliniques*, 102.

264 Richer, 94–95.

precisely those previously unknown features of the attack in whose articulation, as shown in the previous section, photography played a constitutive role.

Another significant change in the new four-stage model concerned the period of delirium. Admittedly, this period retained its original name and its position at the end of the attack. But its characteristics were now more clearly defined than in the tripartite model. Reflecting Bourneville's findings, in the new formula, the period of delirium entailed hallucinations whose content mainly consisted of changing daily impressions and current preoccupations of the patients' minds.²⁶⁵ During this period, the patients partly regained consciousness and conveyed their emotionally charged hallucinations through highly variable facial expressions, gestures and utterances.²⁶⁶ In effect, in the new four-stage model, both the period of passionate attitudes and the delirium were characterised by explicit expressions of emotions. However, in the period of passionate attitudes, the emotional content of the hallucinations appeared to be fixed. By contrast, the period of delirium "was less stereotypical,"²⁶⁷ as its emotional content changed across different attacks of the same patient. Thus, the two types of hallucinations Bourneville had discovered through the analysis of photographs and protocols now became divided into two distinct periods of the hysterical attack.

An additional, equally significant aspect of the new model was how Charcot defined the distinction between the contents of the second and the third period of the attack. In his description of the four-stage formula quoted above, Charcot explicitly designated passionate attitudes as 'purposive.' His designation was meant to emphasise the emotionally expressive character of these attitudes. Put simply, the designation drove home the message that all of the patients' facial expressions and gestures manifested during this particular period of the attack should be regarded as clear-cut physiological manifestations of their emotional states.²⁶⁸ By contrast, in the same quote, Charcot labelled the convulsive postures and attitudes belonging to the second period of his new four-stage model as 'purposeless.'²⁶⁹ Apart from calling it the period of great movements, Charcot also referred to this segment of the attack as

265 See Richer, 128.

266 See Richer, 125, 129.

267 Richer, 129.

268 See Richer, 94, 124. See also, e.g., Charcot, "Lecture 18: Six Cases," 243.

269 In the French original, Charcot used the terms 'contradictaires, illogiques' and 'logiques' to designate the bodily attitudes and facial gestures that constituted the second and the third period of the attack, respectively. See Charcot, *Oeuvres complètes*, 1:15. The terms he used could be fittingly translated as 'inconsistent' and 'consistent,' or 'incoherent' and 'coherent.' Nevertheless, I have retained the terms 'purposeless' and 'purposive' since these were used in the English translation of Charcot's lectures. See Charcot, "Lecture 1: Introductory," 13. Yet, to avoid any confusion, we should note that the terms 'purposive' and 'purposeless' were used by British 19th-century physiologists and neurologists to designate the difference between voluntary and involuntary (i.e., reflex) movements. See, e.g., Carpenter, *Mental Physiology*, 16, 19. This distinction did not apply to Charcot's description of the hysterical attack. As discussed previously, the Salpêtrians insisted that hysteria patients were entirely unconscious of their environment during the 'purposive' period of passionate attitudes. This, in turn, meant that, during this period, the patients were incapable of performing any voluntary movements. Therefore, if we retain the adjectives 'purposive' and 'purposeless' when referring to various periods of the hysterical attack in Charcot's sense, it is

the 'period of clownism.'²⁷⁰ Moreover, he explicitly designated as "illogical attitudes" some of the more acrobatic postures that constituted this period of the attack.²⁷¹ The most recognisable example of such 'illogical attitudes' was the so-called *l'arc de cercle*. In this posture, the patients' bodies were arched backwards into a semicircle, with only their feet and head touching the ground.²⁷² Notably, in his lectures, Charcot also used additional terms, such as strange, disorderly, bizarre, and outrageous, to describe his patients' postures and gestures during the second period of the attack.²⁷³ All these different terms served to underscore Charcot's view that various postures comprising the second period of the attack in his four-stage model did not express any particular emotions. Instead, their only function was "an excessive expenditure of muscular force."²⁷⁴

Hence, it can be said that in creating his new four-stage formula of the attack, Charcot pried apart inexpressive convulsions (i.e., great movements) from emotionally expressive postures (i.e., passionate attitudes). In his previous tripartite model, the expressive and inexpressive attitudes had been bundled together under the vaguely defined second period of contortions.²⁷⁵ I argue that the prying apart of the period of great movements from the period of passionate attitudes hinged on the systematic registering, analysis, and classification of hysteria patients' facial expressions and gestures through the explorative use of photography discussed in the previous section. Before such systematic use of photography, even Charcot had to admit that, when he looked at his patients' attacks, all he saw was chaos and confusion.²⁷⁶ Photography enabled the Salpêtrians to cut up the hysterical attack and translate it into a collection of mutually comparable images, many of which focused on the patients' facial expressions. It thus made possible a systematic visual analysis of the more elusive aspects of this highly dynamic and complex symptom. Without photography, the clear-cut distinction in the temporal succession and the 'typical' character of the emotionally inexpressive (i.e., 'purposeless') and expressive (i.e., 'purposive') periods of the attack might not have emerged.²⁷⁷

essential to emphasise that these terms merely designate the differences in the emotionally expressive or inexpressive character of the respective phases of the attack.

270 Charcot, "Lecture 18: Six Cases," 241.

271 See Richer, *Études cliniques*, 73–74. Somewhat inconsistently, Charcot used the adjective 'illogiques' to describe the content of the second period of great movements on the whole and to designate only some of the typical attitudes that belonged to this period.

272 See Charcot, "Lecture 18: Six Cases," 241–42.

273 See Charcot, 241.

274 See Richer, *Études cliniques*, 73.

275 See Charcot, "Lecture 11: Ovarian Hyperaesthesia," 277. See also Charcot, "Lecture 13: Hystero-Epilepsy," 305.

276 See section 1.1.1.

277 At this point, neither Charcot nor Richer made any direct reference to Duchenne. Nevertheless, it appears to me that Charcot's division of the hysterical attack into the emotionally expressive and inexpressive periods was influenced by Duchenne. In his study of emotional expressions, Duchenne differentiated between contractions of the facial muscles that were expressive of particular emotions and those that were entirely inexpressive. Duchenne designated any inexpressive contraction as "a grimace that resembles no expression." Duchenne de Boulogne,

Moreover, it appears to me that the use of photography had an additional benefit. It allowed Charcot and his team to systematically monitor and categorise the fluctuations in the patients' emotional states during the attack by focusing exclusively on their externally observable physical manifestations.²⁷⁸ Put differently, photography enabled the Salpêtrians to analyse the emotional character of the attacks while circumventing the patients' subjective experiences of the emotions their faces and bodies expressed. The photography-based focus on the patients' faces and bodies also permitted the Salpêtrians to largely ignore the personal details about the memories of dramatic adverse life events that the patients kept reliving with each new attack. We have discussed previously that Bourneville wrote down the utterances his patients had made during their hallucinations and then compared the emotional content of these utterances with the photographs of the patients' emotional expressions and gestures. We have also seen that Bourneville categorised the life events these utterances referred to as happy or sad. Yet, on the whole, the Salpêtrians were uninterested in reconstructing the exact narratives of the individual life events that, as they believed, had triggered the patients' hysterical attacks.

In fact, Richer argued that the memories which hysteria patients relived during the period of passionate attitudes should not be regarded "as pure and simple expressions of the truth."²⁷⁹ He conjectured instead that the patients' memories were probably embellished or, in some cases, even entirely created by their imagination.²⁸⁰ This conjecture closely reflected the influential view espoused at the time by the psychologist Théodule Ribot. According to Ribot, every memory was "at once deceptive and exact, since its very exactitude is derived from" a subjective distortion of 'objective' facts.²⁸¹ Since they doubted the potential veracity of the patients' utterances about the past experiences, the Salpêtrians chose to ignore much of the messy narrative details.

Facial Expression, 17. He further stated that grimaces were impossible to meaningfully interpret, as they mimicked convulsive spasms, which one saw in various chronic diseases of the nervous system. Ibid. It is conceivable that Charcot expanded Duchenne's differentiation between expressive and inexpressive facial expressions to include bodily gestures. Importantly, as I will show in the following two sections, the use of photography in Charcot's subsequent hypnotic experiments continued to be informed by the differentiation between expressive and inexpressive facial expressions and gestures. But we will see that in the latter context, Charcot framed this differentiation by explicitly referring to Duchenne's experiments with facial expressions of emotions.

278 For a similar insistence that the scientific study of emotions should focus exclusively on the 'objective' external manifestations of emotions and disregard their 'subjective' aspects (i.e., the individual's internal mental states), see Ribot, *Psychology of the Emotions*, 1–3. Théodule Ribot was a professor of experimental psychology. Charcot often quoted Ribot in his lectures. See, e.g., Charcot, "Lecture 22: Brachial Monoplegia," 309n1. Significantly, Ribot also translated into French the works of multiple authors who influenced Charcot, such as Wilhelm Wundt, Alexander Bain, and Herbert Spencer. See Ribot, *La psychologie allemande*; and Ribot, *English Psychology*.

279 Richer, *Études cliniques*, 119.

280 Richer, 119.

281 Ribot, *Diseases of Memory*, 61–62. Ribot further asserted: "If we could compare our past, as it has really been, fixed before us objectively, with the subjective representation which we have in memory, we would find the copy formed upon a particular system of projection: each of us is able to find his way without trouble in this system, because he has himself created it." Ibid., 62.

In short, for Charcot and his team, the exact content of the patients' idiosyncratic memories was not of interest in itself. For the Salpêtrians, such memories were epistemically significant only in as much as they affected the patients in ways that could be registered 'objectively' through photography or other physiological measurements. In effect, it was owing to this highly selective focus that the Salpêtrians could articulate a shared pattern of how the external manifestations of patients' emotional states changed in the course of the hysterical attack. They then used this pattern as the basis for dividing the attack into four distinct periods.

To be sure, physicians of previous generations, including Briquet, had repeatedly emphasised the fundamentally emotional character of the hysterical attack.²⁸² Yet, the novelty of the Salpêtrian four-stage model was that it posited the existence of a distinct temporal pattern in the fluctuation of the external expressions of patients' emotional states during the hysterical attack. This temporal pattern not only endowed hysterical attack with a nosographic specificity but also had a key diagnostic significance. It provided the Salpêtrians with a diagnostic criterion based on which, at least in principle, they could differentiate between hysterical and epileptic attacks.²⁸³ However, in 1878, when Charcot first mentioned his new four-stage formula, it was still an abstract model that emerged from the analysis of heterogeneous empirical data, including photographs, sketches 'from nature,' written protocols, and various physiological measurements. Moreover, the data were produced at different times, across many different hysterical attacks, and by monitoring different patients. Due to their idiosyncratic character, these data could not be used in clinical practice for diagnostic purposes. Hence, to turn his new four-stage model into a useful diagnostic tool, Charcot still needed to construct a visualisation of it that even an inexperienced physician could use to navigate what otherwise appeared "to be an inextricable labyrinth" of the hysterical attack.²⁸⁴

To achieve this, Charcot worked with Paul Richer on synthesising the empirical data into visualisations of the hysterical attack's fundamental type, which were purged of misleading idiosyncrasies. The results of this effort were published in Richer's *Études cliniques*, first in 1881 and then, in an extended form, in 1885.²⁸⁵ As mentioned previously, both editions of Richer's *Études cliniques* were entirely devoid of photographs. Instead, each edition contained approximately one hundred schematic drawings that systematically visualised hysteria patients' typical gestures and facial expressions across all four periods of the 'complete and regular' type of the hysterical attack.²⁸⁶ Richer's schematic drawings did not depict particular individuals but showed generic female patients in a visually simplified manner (fig. 1.8, right). Importantly, the schematic drawings were embedded in the text that detailed the distinctive character and the temporal unfolding of each of the four periods of the hysterical attack. In addition to the 'regular' type, Richer also described and visualised the most common variations in

282 For a succinct overview, see, e.g., Micale, *Approaching Hysteria*, 22–24.

283 The importance Charcot placed on such diagnostic differentiation was discussed in section 1.1.1.

284 Charcot, "Lecture 1: Introductory," 13.

285 See Richer, *Études cliniques*; and Richer, *Études cliniques*, 2nd ed.

286 See Richer, *Études cliniques*, 1–158; and Richer, *Études cliniques*, 2nd ed., 1–147.

the typical postures and attitudes across patients.²⁸⁷ Moreover, in a separate section of the *Études cliniques*, Richer delineated multiple versions of what Charcot referred to as ‘incomplete’ attacks.²⁸⁸ In incomplete attacks, as Charcot claimed, “each of the [four] periods may appear alone, or again one or two among them will be found wanting... but it will always be easy to those who possess the formula to bring them under one fundamental type.”²⁸⁹

Taken together, all the aspects listed above suggest that the primary aim of Richer’s *Études cliniques* was to teach the reader how to recognise the underlying pattern of regularities that constituted the symptom’s ‘fundamental type.’ Hence, drawing on Lorraine Daston and Peter Galison, I argue that Richer’s *Études cliniques* can be regarded as an atlas of the hysterical attack. Put differently, the *Études cliniques* was created as a systematic complication “of working objects” that trained the eye how to reliably identify distinctive features of the hysterical attack across its many variations.²⁹⁰ It did so by instructing the reader “what is worth looking at, how it looks, and, perhaps most important of all, how it should be looked at.”²⁹¹

Figure 1.8. Left and middle: photographs by Paul Regnard of a patient during hysterical attacks. From: Bourneville and Regnard, *Iconographie photographique*, vol. 1, plates 20 and 21. Right: schematic drawing by Paul Richer of a typical posture from the passionate attitudes period of the hysterical attack. From: Richer, *Études cliniques*, 114, fig. 77.



From this perspective, it appears hardly surprising that the *Études cliniques* did not include any photographs. Regnard’s photographs visualised individual patients’ concrete hysterical attacks in all their particularity. Thus, apart from registering diagnostically salient features of the attack, the photographs also unavoidably contained

287 See, e.g., See Richer, *Études cliniques*, 83–85.

288 Richer, *Études cliniques*, 2nd ed., 165–323.

289 Charcot, “Lecture 1: Introductory,” 13.

290 Daston and Galison, *Objectivity*, 22.

291 Daston and Galison, 23.

an abundance of irrelevant, idiosyncratic details.²⁹² We have seen that the Salpêtrians used photography as a valuable analytical tool for generating empirical data about various aspects of the hysterical attack during the search for the symptom's underlying regularity. Yet, I suggest that photography proved less useful in the subsequent research stages. Photography was neither well suited for synthesising the empirical findings to construct an effective visual diagnostic tool nor for communicating Charcot's new four-stage formula of the hysterical attack to the medical community.

As discussed previously, the Salpêtrians developed targeted 'reading' strategies to disambiguate relevant from irrelevant details across individual photographs. However, an uninitiated viewer lacked the visual expertise requisite to pick out the aspects the Salpêtrians considered to characterise the hysterical attack's fundamental type. Hence, such a viewer could have easily been distracted by epistemically irrelevant details entailed in the photographs of individual patients. For this reason, in my opinion, Regnard's photographs remained excluded from the *Études cliniques* and confined to the context of the *Iconographie photographique*. As empirical data, the photographs fitted well in the *Iconographie photographique*, which, due to its explicit clinical character, did not present polished results but instead offered insights into ongoing research.

Hence, to be included in the *Études cliniques*, those typical postures that repeated themselves across photographs of different attacks and multiple patients first had to be translated into schematic drawings (fig. 1.8). During such intermedial transcription,²⁹³ the photographs underwent the process of visual disambiguation. The visual features that had been deemed salient—i.e., typical gestures and facial expressions—were extracted from individual photographs and made visible in the resulting schematic drawings. By contrast, all incidental details the photographs had unselectively registered were treated as random noise and filtered out. Such irrelevant details included various objects in the background, specific lighting conditions, the patient's individual facial features, idiosyncratic variations in the typical postures across different attacks, and any accidental blurring of body parts caused by movement. In effect, by suppressing the accidental and idiosyncratic, the creation of schematic drawings facilitated the extraction of the typical and the essential from the accumulated observations of the individually variable. It can, therefore, be said that the role of intermedial transcription was not just to extract the salient information from the photographs but also, through the change of the visual medium, to articulate this information more emphatically. In short, the process of translating the photographs into schematic drawings was by no means semantically neutral. In executing it, Richer made interpretational decisions.

Just as importantly, the creation of schematic drawings allowed Richer to combine and condense the information obtained separately through photography, direct observation, and sketching 'from nature.' This was necessary because, as discussed

292 For example, some images were blurry or contained distracting visual details of the patients' environment. See, e.g., Bourneville and Regnard, *Iconographie photographique*, vol. 1, plates 36–39.

293 I am using the term Ludwig Jäger has introduced to designate various operations through which "a second symbolic system of mediality is used for comments, explanation, explication, translation, variation or closure (of the semantics) of the first system." Jäger, "Transcriptivity Matters," 53.

previously, none of these different methods, when used in isolation, could capture all the salient aspects of the attack. Thus, only by merging the data generated through different methods was Richer able to produce schematic drawings that jointly visualised all stages of the attack, from its beginning to its end. Moreover, the operation of synthesis also explains why the majority of Richer's schematic drawings in the *Études cliniques* showed the patients' entire bodies, whereas most of Regnard's photographs focused only on their faces and the upper bodies. Hence, the operations that went into producing the schematic drawings were not just selecting, filtering, deleting, simplifying, highlighting, and abstracting. They also included summarising, generalising, standardising, and averaging across different sources. The result was what Daston and Galison have termed "reasoned images."²⁹⁴ Put simply, each schematic drawing included in Richer's *Études cliniques* visualised a "never seen but nonetheless real" typical posture of the hysterical attack.²⁹⁵

But even at this stage, the work on constructing the visual model of the major hysterical attack was still not finished. Instead, the construction of the visual model reached its crowning point with the second edition of Richer's *Études cliniques*. This edition contained a novel visual element—the synoptic table of the major hysterical attack (fig. 1.9). It should be emphasised that the content of the synoptic table was not new. In fact, it consisted of select schematic drawings that were interspersed throughout the text of the *Études cliniques*. However, the novel aspect was that these individual visual elements were now organised into a single diagram. Specifically, eighty-two schematic drawings were brought together and arranged into rows and columns according to a particular principle.²⁹⁶ As Richer explained, the upper row contained the schematic drawings of the eleven typical poses that constituted the four periods of the hysterical attack in its "classic form."²⁹⁷ The columns contained the schematic drawings of the most common variations of the poses in the upper row. As explicitly stated by Richer, the table was meant to enable the physician not only to "grasp at a glance" the different periods of the "complete and regular" hysterical attack but also to "deduce its main variations" in which one or more periods could be missing.²⁹⁸

In effect, the synoptic table was a composite image explicitly constructed to simultaneously encode several aspects of the hysterical attack in distinctly visual terms. First, each schematic drawing within the table was of interest in itself, as it provided salient information about hysteria patients' typical postures, gestures, and facial expressions during various phases of the attack. Second, when viewed as a sequence, the eleven drawings in the upper row of the table visualised the temporal unfolding of the hysterical attack's fundamental type. Third, when viewed along each column separately,

294 Daston and Galison, *Objectivity*, 60.

295 Daston and Galison, 60.

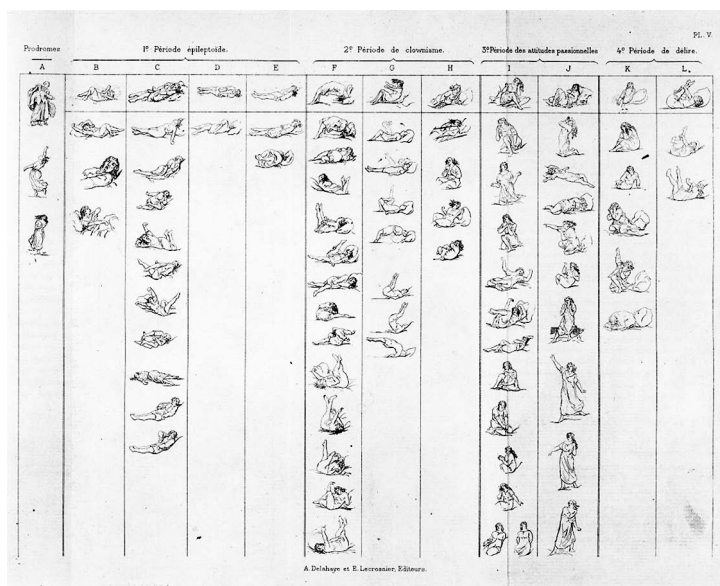
296 As Lorraine Daston showed, synoptic images as a form of scientific visualisation were initially developed in the late seventeenth century in the context of botanical illustrations and weather maps. According to Daston, their aim was to allow the compression of multiple empirical observations into a single "compact visual object that could be seized at a glance." Daston, "Synoptic Scientific Image," 166.

297 Richer, *Études cliniques*, 2nd ed., 167.

298 Richer, 167.

the drawings showed the range of variability for each of the postures constituting the temporal sequence of the fundamental type. Fourth, selective combinations of various columns across the table resulted in different versions of incomplete hysterical attacks. Hence, which aspect of the attack the viewers saw depended on how they chose to look at the synoptic table. In other words, the synoptic table was meant to be used operatively in the sense defined by Sybille Krämer.²⁹⁹ It was a visual tool with which a viewer had to engage actively in order to discover multiple aspects of the hysterical attack.

Figure 1.9. Synoptic table of the four-stage model of the hysterical attack. From: Richer, *Études cliniques*, 2nd ed., plate 5.



It should be emphasised that the synoptic table visualised neither a single attack nor its fundamental type in isolation. Instead, it visualised the variability of the hysterical attack's fundamental type across its complete and incomplete versions. Moreover, I want to point out that the visual organisation of Richer's synoptic table reflected the basic principles of the so-called descriptive statistics. This type of statistical analysis summarises a dataset into a measure of central tendency (i.e., a value that presents the centre of that dataset) and a measure of variability (i.e., a description of the dispersion of data around the central tendency).³⁰⁰ If we look closely, we will see that this is precisely how the schematic drawings of bodily postures were spatially organised within the synoptic table. The first row showed the fundamental type, or in other words, the central tendency of the hysterical attack. The rest of the table visualised the distribution of the hysterical attack's variability in relation to its central tendency. Since Richer's

299 See Krämer, "Operative Bildlichkeit," 104–5.

300 For details about descriptive statistics, see, e.g., Goodwin, *Research in Psychology*, 141–49.

synoptic table expressed the distribution of variability by establishing particular spatial relations among its constitutive visual elements (i.e., individual schematic drawings), I suggest that this table can be designated as a statistical map.³⁰¹ In constructing this map according to the principles of statistical analysis, Richer found an effective way to visually tame the complexity of the hysterical attack by subsuming its multiple variations into a single visualisation.

The synoptic table was not only structured as a map of the hysterical attack at the formal level. It was also intended to be used operatively as a map in clinical practice. The table provided the physician with a flexible tool he could use to explore and visually compare many possible variations of the hysterical attack by differently combining the elements contained in the rows and columns. In doing so, the physician could learn to visually recognise various versions of the hysterical attack as manifestations of the same symptom.³⁰² Once his eye had been sufficiently trained in this manner, the physician would know how to navigate the messiness of actual clinical cases. Acquiring such a visual skill was all the more necessary since, as both Charcot and Richer emphasised, irregular and incomplete variations of the hysterical attacks were predominant in the actual clinical practice.³⁰³

Significantly, although the schematic drawings visualised generic female bodies, Charcot regarded the synoptic table as equally valid for diagnosing hysterical attacks in male patients. The purported cross-gender applicability of the synoptic table may appear surprising. Yet this was a direct consequence of Charcot's claim that there was a "perfect resemblance" between hysterical attacks in both genders.³⁰⁴ Charcot conceded a few minor differences between male and female patients concerning some of the typical bodily attitudes, yet declared these differences to be of "minor importance."³⁰⁵ In Charcot's view, what mattered was that the "typical character of the different attitudes" constituting the hysterical attack "differ[ed] in absolutely nothing" between female and male patients.³⁰⁶ Further emphasising this point, Charcot insisted on the striking analogy between female and male patients "not only as regards the fundamental type, but also the aberrant forms" of the hysterical attack.³⁰⁷

301 Broadly speaking, statistical maps are visualisations that display statistical relations in a graphic form. For an insightful analysis of the influence of statistical theory on practices of data visualisation and the emergence of statistical maps in the early nineteenth century, see Friendly, "Golden Age." I use the term map here as defined by Sybille Krämer. For Krämer, maps are "surfaces that contain graphic markings of relations between places in the form of a spatial, two-dimensional representation. These places can be real or fictional, they can refer to every possible form of bodies, territories, empirical facts or purely epistemic entities." Krämer, *Medium, Messenger, Transmission*, 187.

302 Richer, *Études cliniques*, 2nd ed., 168.

303 See Richer, 166. See also, e.g., Charcot, *Leçons du mardi*, vol. 1, 2nd ed., 137.

304 Charcot, "Lecture 18: Six Cases," 242.

305 Charcot, 220. For instance, during the period of clownism, postures that entailed the excessive extension of muscles were apparently more dominant in male patients. By contrast, female patients more often manifested postures in which their bodies were flexed. See Charcot and Richer, *Les démoniaques dans l'art*, 99.

306 Charcot, "Lecture 18: Six Cases," 242.

307 Charcot, "Lecture 19: Six Cases," 251.

More problematically, however, Charcot also claimed that the visual pattern laid out in the synoptic table was ahistorical and thus universally valid. As such, it could be used to diagnose hysterical attacks in all countries and at all times.³⁰⁸ In making this claim, Charcot either erroneously neglected or willfully chose to ignore the fact that his model was constructed by synthesising the findings derived from a relatively small number of patients.³⁰⁹ Hence, as already pointed out by several of Charcot's contemporaries, the generalisability of this model was highly questionable.³¹⁰

Yet, regardless of the potentially limited validity of the synoptic table, I want to emphasise the effect its construction had on the Salpêtrian use of photography. Specifically, I argue that once the synoptic table had been established, the Salpêtrians ceased to deploy photography as an experimental condition concerning the hysterical attack.³¹¹ Instead, from that point onwards, the Salpêtrians used photography merely to confirm the nosographic type and its variations as defined in the synoptic table. That this was indeed the case will become apparent when we realise that major technical innovations introduced by Albert Londe, who took over the photographic service at the Salpêtrière in the early 1880s,³¹² had no epistemic effects on Charcot's four-stage model of the hysterical attack.

The initial innovation Londe implemented immediately upon taking up his post at the Salpêtrière consisted in replacing the use of the wet collodion with the newer gelatin dry plate process.³¹³ The gelatin dry plates were not only easier to use but they also

308 See Charcot, *Leçons du mardi*, vol. 1, 2nd ed., 105.

309 As pointed out in the previous section, ten hysteria patients stood at the centre of the photographic research published in the *Iconographie photographique*.

310 See, e.g., Gowers, *Manual*, 2:985. To counter this criticism, Charcot and his team developed an epistemically questionable approach that consisted in appropriating various non-medical data for their medical purposes. On the one hand, they combed through written historical documents looking for "unknown traces" of the *grande hystérie* since antiquity. Richer, *Études cliniques*, 2nd ed., 797. On the other hand, they turned to art history, collecting reproductions of paintings and drawings by famous artists (e.g., Raphael and Rubens) and anonymous authors. They primarily searched for artworks that depicted scenes of demonic possession or religious ecstasy. The fact that select poses of the possessed individuals shown in the works of art from various historical periods resembled the postures comprising Richer's synoptic table was meant to demonstrate the purportedly universal, ahistorical character of Charcot's four-stage model of the hysterical attack. In other words, Charcot and Richer used the synoptic table of the major hysterical attack to retrospectively 'diagnose' hysteria in historical works of art. They referred to this practice as 'retrospective medicine.' See Richer, 797–956; and Charcot and Richer, *Les démoniaques dans l'art*. Problematically, in doing so, they reductively treated highly diverse works of art as seemingly transparent, straightforward documents of medical cases.

311 In the following sections, we will see that photography continued to be used in epistemically productive ways in other segments of Charcot's hysteria research.

312 See Londe, *La photographie médicale*, 2.

313 Londe, 2. Londe came to the Salpêtrière in 1882 and became the director of the photographic service in 1884. For a more extensive analysis of Londe's diverse photographic innovations, see Gunthert, "Klinik des Sehens." For Londe's own account of his innovations, see Londe, *La photographie médicale*. It is also worth noting that in 1888, together with Paul Richer and Gilles de la Tourette, Londe launched the influential medical journal *Nouvelle iconographie de la Salpêtrière*. The journal was richly illustrated with Londe's photographs of Salpêtrian patients.

significantly reduced the exposure times to only a fraction of a second.³¹⁴ Deploying this more advanced photographic technique, Londe could produce instantaneous photographs and thus capture the aspects of the patients' movements that were essentially undetectable to the human eye. But far from stopping at this point, in the next step, Londe drew on the chronophotographic experiments conducted at the time by the English-American photographer Eadweard Muybridge and the French physiologist Étienne-Jules Marey.³¹⁵

Muybridge's and Marey's experiments had in common that they both employed photography as a tool for sequential analysis of movement by generating multiple exposures.³¹⁶ Nevertheless, there were significant differences between their respective approaches. Muybridge deployed a system of multiple cameras and trip-wire shutters to decompose movement into a sequence of individual images. Each resulting image showed a particular phase of the movement studied, yet it was impossible to "determine the time [that] elapsed between the sequence of images."³¹⁷ By contrast, Marey used a single camera with which he made multiple, mutually superimposed exposures of sequential phases of movement on a single photographic plate. In Marey's approach, each exposure was made at precisely determined equidistant intervals, and the result was a single image.³¹⁸ However, Londe contended that neither Muybridge's nor Marey's approaches were suited to the study of movement from the medical standpoint.³¹⁹

Combining elements of both Muybridge's and Marey's approaches, Londe invented two new multi-lens photographic cameras that were explicitly designed to enable chronophotography in the medical context.³²⁰ The first camera that Londe developed in 1883 had nine objectives arranged in a circle on a single photographic plate.³²¹ In 1893, Londe finalised the second, technically more advanced camera with twelve

314 Richard Leach Maddox invented the process in 1871. Apart from the increased light sensitivity, other major advantages of this process were that the photographer neither had to prepare fresh plates directly before exposing them nor to develop them immediately after taking a photograph. For details about this process, see Hannavy, *Nineteenth-Century Photography*, 438–39, 549.

315 See Londe, *La photographie médicale*, 105–15. Eadweard Muybridge began conducting his famous chronophotographic studies of horses in motion in the early 1870s. Étienne-Jules Marey started experimenting with the approach he initially called 'photochronography' and later renamed it 'chronophotography' in early 1882. For details, see Rabinbach, *Human Motor*, 100–3.

316 For an incisive analysis of Marey's chronophotography, see Braun, *Picturing Time*, 42–149. For Braun's analysis of Muybridge's approach to chronophotography, see *ibid.*, 228–54. See also Rabinbach, *Human Motor*, 104–15. For a study that examines Marey's chronophotography and his graphic method as visualisations of essentially invisible phenomena, see Snyder, "Visualization and Visibility."

317 Rabinbach, *Human Motor*, 103.

318 Rabinbach succinctly summarised the major differences between these two approaches: "Whereas Muybridge's interest centered almost exclusively on the decomposition of movement into phases, Marey wanted to determine the precise relationship between time and motion in the sequences." Rabinbach, 103.

319 Londe, "Photochronography in the Medical Science," 424.

320 For a discussion of mutual influences between Londe and Marey and details concerning their occasional collaboration, see Braun, *Picturing Time*, 85.

321 For details about this camera, see Londe, *La photographie médicale*, 107–12.

objectives arranged in three parallel rows.³²² Londe's cameras could thus decompose the movement studied into either nine or twelve separate images. In each case, the resulting images occupied different parts of a single photographic plate. The arrangement of the images on the photographic plate was determined by the arrangement of the objectives on the camera.³²³ Moreover, the shutters of the multiple objectives in both cameras could be released sequentially in a fully automated manner. But unlike all other available chronophotographic devices, Londe's cameras were specifically devised to permit the releasing of shutters at variable intervals within a single sequence.³²⁴ This technical innovation allowed the physician to modify the intervals between successive exposures "according to the velocity of the motion observed."³²⁵ In other words, using Londe's cameras, the physician could translate the patients' movement into a sequence of photographs taken at precisely known but flexibly determined intervals. Consequently, Londe's cameras did not only make possible the photographic decomposition of the patient's movements into the bodily attitudes that "escape direct observation."³²⁶ They also enabled the physician to explore the temporal relations between the isolated phases of the movement.

Yet, when photographing the hysterical attack, Charcot and his team used Londe's cameras in a way that largely ignored their innovative potential. They continued to observe the attack, chose the attitudes they wished to isolate, and made single exposures of the moments thus selected.³²⁷ They then combined photographs obtained across different attacks of a single patient into a sequence that conformed to the canonical form specified in the synoptic table.³²⁸ Hence, when photographing the hysterical attacks, Charcot and his team did not deploy the new cameras in a "mechanically objective" way that minimised the extent of human intervention.³²⁹ Instead, they used

322 See Londe, 112–15. See also Londe, "Photochronography in the Medical Science," 424–25. Londe spent more than ten years perfecting his twelve-lens camera by developing different prototypes. The final version of the camera was presented to the public in November 1893, after Charcot's death. See Gunthert, "Klinik des Sehens," 36.

323 Not just the arrangement of the individual images on the photographic plate but also the sizes of the plates differed between the cameras. The size of the photographic plate in the nine-lens camera was 13 x 18 cm. The nine circular images were arranged in a circle and occupied only a fraction of the plate. See Londe, *La photographie médicale*, 110n1. See also *ibid.*, 112, fig. 52. By contrast, the twelve-lens camera was constructed for a photographic plate whose size was 24 x 30 cm. In the latter camera, the twelve rectangular images were arranged to fill up the entire photographic plate. *Ibid.*, 111.

324 Marey's cameras operated with fixed, equidistant intervals. Londe, "Photochronography in the Medical Science," 424.

325 Londe, 424.

326 Londe, 424.

327 Londe, 424.

328 See, e.g., Charcot, "Lecture 18: Six Cases," 240–42.

329 I am using the term 'mechanical objectivity' in the sense introduced by Daston and Galison. See Daston and Galison, *Objectivity*, 42–43. According to Daston and Galison, in the mid-nineteenth century, 'mechanical objectivity' came to dominate experimental sciences. The epistemic goal underlying this type of objectivity was to deploy mechanical instruments (such as the photographic camera) in a way that minimises the human intervention and thus enables the production of experimental data "untainted by [the researchers'] subjectivity." *Ibid.*, 43. As

them for a selective decomposition of the attack, which remained informed by the physician's trained judgment about what to photograph and what to overlook.

Therefore, it can be said that despite the new technical possibilities, Charcot was not interested in discovering the aspects of the hysterical attack undetectable to the human eye. I suggest that such imperceptible aspects had no place in the synoptic table whose primary purpose was to train the human eye to identify the fundamental type of the attack across its many variations. Simply put, when it came to diagnosing the hysterical attack, Charcot had no intention of using photography to displace the physician's direct observation of the symptom. It is in this sense that Charcot famously stated in February 1888: "I am nothing but a photographer; I inscribe what I see."³³⁰ Implicit in this statement was a declaration of the epistemic primacy of the trained human eye. Unlike the indiscriminate photographic camera, the physician could make visual judgments and thus learn how to discern clinically significant features of the symptom from those that were mere noise. For Charcot, photography was a potentially productive epistemic tool in the medical context only when its use was informed by the expert human judgment. Thus the physician first had to look at the patient and judge the potential medical salience of what he was seeing before using the camera to selectively register a particular aspect of the patient's symptom.

As I have argued previously, in the early stages of their research, the Salpêtrians used photography to discover the underlying regularities of the attack that were, in principle, accessible to human vision. Yet, although visible, such salient features of the hysterical attack were not immediately apparent, as they were firmly embedded into the symptom's often dramatic temporal unfolding and spread across different patients. Thus, the salient visual features of the attack first had to be made systematically analysable through the targeted, exploratory deployment of photography. Once the symptom's underlying regularity and its typical visual manifestations had been identified, the role of photography concerning the hysterical attack shifted from "a question-generating" to "an answering machine."³³¹ Hence, when it came to visualising the hysterical attack, subsequent deployments of photography rested entirely "on [the] identity of performance."³³² As a consequence of this shift in its use, from the early 1880s, photography lost the ability to generate any further epistemic surprises concerning the hysterical attack.³³³ No amount of technical innovation could change that.

my analysis above has demonstrated, Charcot's approach to photography did not fit into this paradigm.

330 Charcot, *Leçons du mardi*, 1:178.

331 Rheinberger, *History of Epistemic Things*, 32.

332 Rheinberger, 32.

333 The interpretation I have posited here directly contradicts the views held by the art historian André Gunthert and the media studies scholar Ute Holl. Both Gunthert and Holl have argued that before Londe arrived at the Salpêtrière, photography had had a purely museological or illustrative function. They have both insisted that Londe's technical innovations turned photography into an epistemic instrument that actively shaped the study of the hysterical attack. See Gunthert, "Klinik des Sehens," 29–30, 35–36; and Holl, *Cinema, Trance, Cybernetics*, 144–46.

To sum up, my analysis has shown that during the mid-to-late 1870s, Charcot and his team used photography as an experimental condition in their research into the hysterical attack. Such exploratory use of photography enabled them to produce new empirical insights into the hysterical attack's repetitive visual features, temporal development, and most common variations. I have underscored how the epistemic efficacy of photography was contingent on its embeddedness into a specific experimental system and the coordination with physiological measurements, written observations, and sketching. Regardless of whether or not the thus obtained photography-based insights could stand the test of time, they were epistemically significant because they led to Charcot's reconfiguration of the initial tripartite into a new four-stage model of the hysterical attack. Moreover, we have discussed how through the process of intermedial transcription, Regnard's heterogeneous photographs provided the basis for the subsequent development of the synoptic table of the hysterical attack. By creating the synoptic table, Richer succeeded in mapping the fundamental type of the hysterical attack and its multiple incomplete variations within a single diagrammatic visualisation. The synoptic table thus became an effective diagnostic tool that trained the physician how to look at chaotic convulsive fits and recognise in them a hysterical attack.

But, as Charcot repeatedly pointed out, the synoptic table had an additional benefit apart from its diagnostic value. For Charcot, this multipart visualisation also demonstrated "that in the attack," and all the other clinical manifestations of hysteria, "nothing is left to chance, everything follows definitive rules."³³⁴ Put simply, the synoptic table provided admittedly indirect but visually compelling evidence that, despite the lack of any detectable anatomical lesion, the hysterical attack, in particular, and hysteria, in general, were governed by strict physiological laws.³³⁵ Consequently, as soon as the basic tenets of the new conception of the hysterical attack had emerged in 1878, Charcot began to redirect his research away from purely nosographic concerns. From this point, his research focused increasingly on elucidating the underlying neurophysiological basis of hysteria. And as the following sections will show, in this process, symptoms other than the hysterical attack came to occupy much of Charcot's attention.

1.2 Hypnotic Experiments: Image-Based Search for the Neurophysiological Basis of Hysteria

So far, we have discussed how the targeted use of various visualisation techniques enabled Charcot and his team to articulate underlying regularities of symptoms such as hysterical attack and ischuria, and thus establish these manifestations of hysteria as clearly defined diagnostic entities. None of the resulting visualisations provided

334 Charcot, "Lecture 1: Introductory," 13.

335 Charcot, 13.