ATROPHIED, ENGORGED, DEBAUCHED: DEGENERATIVE PROCESSES AND MORAL WORTH IN THE GENERAL PARALYTIC BODY

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The nineteenth-century body was a body closely bound to its external environment – an entity that could speak not only of its owner's physical circumstances, but their moral standing. Different types of body symbolized broader issues, from the Lombrosian criminal whose facial features advertised their vocation, to the child with rickets whose deformity served as a damning indictment of urban living conditions. Links between the individual and social bodies were made explicit in metaphors used to describe the human body in health and illness. In *Raw Material* (2000), Erin O'Connor describes how nineteenth century conceptions of disease related pathology to the broader urban environment: the growth of breast cancer, for instance, was compared to urban sprawl. Such metaphors did not simply reflect contemporary attitudes towards social change (the place of women in urban space, for example), but sought to understand a disease's aetiology and character.[1]

In these discourses of disease, the body became a battleground between clean and dirty, health and illness, good and evil. Military metaphors - such as armies of invading and defending cells - emphasized the vulnerability of the body to outside influences and suggested that the maintenance of health was a never-ending exercise. Towards the end of the nineteenth century, this sense of militaristic vigilance became particularly apt when it was revealed that a large proportion of Boer War recruits had been judged physically unfit for service. Amidst concerns for national fitness, the health of the individual body also came under scrutiny. The formation of YMCAs, gymnasiums and sports clubs made physical exercise an aspirational activity, while physical culturists such as Eugen Sandow popularized a bodily ideal that was as much about aesthetic appeal as health.[2] The toned, sculpted body of the physical culturist encapsulated strength and discipline, and as such reflected scientific

thinking of the time that bound the physical fabric of the body together with environmental influences. As the idea of mind-body dualism waned in the nineteenth century, the external body was increasingly seen as a reflection of the individual's internal world demonstrating not only physical health, but also the state of the mind.

A Model Disease in a Model Site: General Paralysis in the Asylum

The interrelation of physical and mental faculties was perfectly illustrated by General Paralysis of the Insane (GPI). GPI was a condition in which patients suffered from a startling array of bodily symptoms: staggering gait, disturbed reflexes, asymmetrical pupils, tremulous voice, and muscular weakness. General paralytic patients were also liable to express grandiose delusions in which they possessed untold wealth, enjoyed close friendships with members of the aristocracy, or had the ability to perform fantastic feats of strength. Such proclamations meant that they tended to find themselves committed to an asylum rather than coming under general hospital care. Their prognosis was bleak, most dying within months, weeks, or sometimes days of admission. Though it had been identified as a distinct disease earlier in the 1800s, the steady accumulation of incurable cases in asylums led to renewed efforts in the last quarter of the century to determine the cause of GPI. An 1896 article reported that 18,438 such patients had been admitted to English and Welsh institutions between 1878 and 1892, most of whom required constant supervision.[3] Among the exciting causes of the disease listed by William Julius Mickle in his extensive study *General Paralysis of the Insane* (1880, second edition 1886) were excessive mental labour, heavy physical work, emotional strain, alcohol and sexual excess. Based on the demographic characteristics of the disease, it was the latter two that came to be seen as the most pertinent factors in the condition's aetiology.

The predominance of men among GPI patients was evident from the outset, with soldiers said to be unusually susceptible. On those occasions when the disease appeared in women, they tended to be cast as innocent victims infected by philandering husbands. As a consequence of this gender disparity, this chapter focuses on the body of the male patient. That psychiatric practice might be gendered has been clearly demonstrated by Hilary Marland's work on puerperal insanity, Joan Busfield on shell shock, and Janet Oppenheim on nervous illness.[4] Contemporary commentary suggests that GPI was primarily seen as a 'male disease': neurologist Frederick Mott estimated there were four to six men for every woman afflicted with the condition.[5]

It was also a disease notable for its location, being peculiarly prevalent in urban areas and - some said - port and mining towns where men indulged excessively in alcohol and sex. This link between urban, industrial life and GPI was made by many writers, with the condition frequently characterized as a disease of civilization.[6] GPI spoke to wider fears about degeneration - the sense that with progress came the risk of regression back to man's primal nature. The conceptualisation of GPI as a 'lower form' of brain disease thus cast it as nature's rebellion against the stresses of modernity. This didn't mean that the patient escaped censure: GPI was 'the apotheosis of selfishness' - a disease whose 'opening chapter [was] moral decadence', its closing 'inevitable premature extinction'.[7] Histories of venereal disease obtained from many general paralytic patients suggested that the development of GPI was no accident. In the early twentieth century, with the identification of the spirochaete that caused syphilis, GPI came to be identified as the final stage of untreated syphilitic infection. As Ludwik Fleck has observed, though, this GPI/syphilis link was not a straightforward one, making the retrospective conflation of the two somewhat problematic.[8] Therefore, this chapter addresses GPI as it was understood by contemporary practitioners, at a time when a

direct link between syphilis and GPI was suspected by many but had not yet become an established 'scientific fact'.[9]

The asylum, as the site where many GPI patients found themselves at the end of their lives, was not necessarily a simple place of incarceration, or somewhere to dispose of inconvenient and unproductive family members. Particularly towards the end of the 1800s, it was increasingly a site where detailed scientific research took place. Work on cerebral localisation - mapping functions such as speech onto areas of the brain - was one such enterprise, and the neurologist David Ferrier conducted much of his early research at the West Riding Asylum at the invitation of Superintendent James Crichton-Browne. That Ferrier undertook such work within the walls of an asylum is a significant fact. At the West Riding, a good deal of space was allocated to the scientific study of mental disease. During Crichton-Browne's period as Superintendent (1866–1876), a new mortuary room and pathological laboratory were constructed and a pathologist appointed.[10] By 1895, the asylum could boast 'a complete outfit of … Laboratories and other rooms as are essential to the scientific investigation and treatment of disease … [comprising] Pathological, Histological, and Bacteriological Laboratories, rooms for Physio-psychical research and Physiological Chemistry, Opthalmoscopic Room, rooms for Electrical treatment, Photographic studio, Library, and Lecture room'.[11] A large asylum was the perfect classroom for the enthusiastic researcher, with hundreds of patients housed together in one institution. At the same time that asylum doctors lamented the build-up of chronic, hopeless cases in their institutions, then, there was a sense that this body of patients presented the ideal opportunity to advance knowledge of mental disease, being easily observable both in life and after death.

No case was more chronic than the general paralytic, and it was this group of patients who also exhibited the most startling physical anomalies, including impaired reflexes and seizures. Physical peculiarities, together with the characteristic grandiose delusions of the

disease, meant that the general paralytic patient was a figure starkly at odds with the strong, self-controlled man idealized by physical culturists. Of greatest interest for the alienist practitioner, however, was that the general paralytic patient offered - in the somatic manifestations of their disease - to reveal something of the processes occurring deep within the body and brain. As such, their body held out the promise of understanding not just GPI, but the mechanics of mental disease more generally.

Disorder and Dissolution: General Paralysis in Life

Within many histories of psychiatry, the asylum patient is imagined as an individual closely and intrusively observed: in the panoptic space of the early asylum, by eighteenth-century 'sightseers' at Bethlem, or in the photographic portraits collected by Hugh Diamond. Observation served several purposes, however, with visual practices allowing the collection of clinical information as well as acting as a mode of surveillance. Upon admission, a brief visual appraisal of the patient's body could reveal a great deal. The actions of the patient betrayed his inner workings in both obvious and subtle ways: attacking a person as the result of a delusion, for example, or appearing to respond to hallucinations when he believed himself unobserved.[12] As just one way of constructing a visual index of mental disease, physiognomy has been discussed in some detail within the history of psychiatry and medicine and - like other conditions - GPI was thought to advertise itself upon a patient's features. Patients were described as possessing 'well marked G.P. Physiognomy', or 'smil[ing] or laugh[ing] in a beaming jovial manner, strongly suggestive of General Paralysis'.[13] In contrast to physiognomical explanations that emphasized facial features as evidence of hereditary taint, however, many contemporary accounts made clear that the face of the general paralytic patient was genuinely altered in muscular tone and action as a result of the condition's effect on the body. Tremors of the lips and tongue were frequently cited as a sure

indicator of the disease and were evident immediately upon meeting the patient or came to the fore during conversation. Whilst a patient's expression might reveal something of their mental state, in the case of GPI expression could also indicate underlying somatic issues, with 'the brow … corrugated from the persistent frontal headache [of GPI] … and the hair … rubbed off the frontal region'.[14]

The external state of asylum patient's bodies is vividly captured in an album of photographs kept by the pathological laboratory of the West Riding Asylum between around 1888 and 1900.[15] As a document intended for the eyes of staff rather than the public, the album explicitly illustrates the concerns of asylum doctors in this period. Alongside standard portraits of patients in the asylum gardens are images of a much broader investigative enterprise: skin conditions, brains removed from the skull at post-mortem and photomicrographs. The images attest to the importance of the patient's physical body as a signifier of deeper-rooted problems. Of the 118 photographs in the album, just over a third depict joint and limb abnormalities, or photomicrography of muscle and nerve tissue. Those photographs that portray external bodily issues - such as arthritis or Charcot's knee - all take male patients as their subject.[16] Whilst not all of the patients depicted in these photographs were GPI sufferers, the images clearly demonstrate how the external state of the body was believed to reveal something of the nature of mental disease.

Many images in the album - of painfully thin arms and rigid, clenched hands - convey a sense of hopeless inactivity that is backed up by the men's case records: 'all his voluntary muscles are flaccid',[17] 'very tremulous when any exertion is made'.[18] In many cases, the muscles of general paralytic patients wasted away as the fine economic balance of the body broke down. As the disease progressed, almost every muscle became involved in a (non) performance that served as visual testament to the patient's loss of physical autonomy and mental acuity. This was a phenomenon with significant socio-economic consequences for

those affected. The loss of bodily power seen in the case of Henry S. rendered him incapable of continuing his occupation as a grocer, for example.[19] GPI's physical and mental symptoms were frequently implicated in a man's dismissal from or giving up of work. Andrew C., formerly a ship broker, 'was first noticed to be careless in signing bills, & in making mistakes in money transactions',[20] whilst Ralph H. 'lost his work because he was too nervous to do it'.[21] The transformation of men's bodies into a chaotic mass (conveyed in statements such as 'struggles wildly ... in a disorderly fashion')[22] and the softening of bodily tissues ultimately rendered them incapable of work, in stark contrast to the 'hard' labouring man. The mental symptoms of GPI posed problems in transacting business and maintaining relationships with colleagues, whilst muscle wastage rapidly removed any 'embodied capital' these men once had, and with it the ability to participate in productive economic activity.[23]

Productivity was an issue of concern in both the social and medical arenas. The mid- to late-nineteenth century saw a great deal of scientific research carried out on human muscles and reflexes, with physiology drawing strongly upon the wider world for its explanations of bodily phenomena. Hermann von Helmholtz's universal law of the conservation of energy and Rudolf Clausius's second law of thermodynamics introduced models of bodily work that relied heavily on the social world for their explanatory power - the body as a machine of intake (fuel) and outgoings (energy) mirrored modern developments such as the steam engine.[24] These were models that could be applied to natural and man-made objects, with the same language used to describe the work of a machine in a factory and the work of the human body. Energy was increasingly synonymous with health, as discourses about labour and the powers of production were both 'medicalized' and extrapolated to the social arena. Clausius's concept of entropy, for instance, suggested the possibility of social decline in a modern world that seemed to be squandering energy in all directions. British physiology had a distinctly Darwinian tone embedded within it, and employed a language of

political economy that was particularly concerned with establishing normal and abnormal measures of the body.[25]

This desire to measure the body's capabilities was particularly evident in investigations into muscle physiology during the second half of the nineteenth century. Utilising instruments such as Jules-Etienne Marey's myograph or Angelo Mosso's ergograph, it was possible to produce graphical representations of the body's work via tracings of muscle contractions or 'fatigue curves'.[26] Notions of fatigue, overwork and excessive expenditure of energy were increasingly applied to mental matters as localisation work highlighted connections between the brain and the rest of the body. As an illustration of excessive and unproductive discharges of energy, the seizures and muscle twitches experienced by many general paralytic patients were startling, sometimes occurring with alarming frequency. James E. exhibited spasmodic twitching of the right side 'on average about 51 times in a minute'.[27] Whole body epileptiform seizures were characterized by severe muscular movements, with or without loss of consciousness, and were considered a worrying portent. They 'usher[ed] in the gravest reductions, often leaving the subject a complete mental wreck',[28] and represented something of a final straw. In 24 of 60 West Riding cases surveyed by Lancaster Asylum's Charles Newcombe, death occurred within a month of a major seizure taking place.[29] Descriptions of seizures often employed militaristic analogies that highlighted the patient's loss of control over their own body: the neurologist John Hughlings Jackson described the 'march of the spasm' in which the progression of a fit swept across the body from its extremities like troops invading a country's borders.[30] Metaphors like these drew attention to the unruliness (and thus unmanliness) of the male body, also speaking to concerns about national fitness at a time when the health of citizens was coming under increasing scrutiny.

As Newcombe's comments above demonstrate, seizures were not only bound up with physical deterioration, but also mental decline. They provide striking evidence for wider theories that sought to explain mental disease as disease of the brain tissue itself. The West Riding Asylum's photograph album vividly conveys this body/brain link, with images of limbs during life pasted next to images of the brain after death – sometimes from the same patient, so that one individual might be quite literally broken down into parts within the album's pages. This visceral juxtaposition of body and brain reflected thinking about the two during life: in its motor manifestations, GPI was a convincing argument for the suggestion that brain anomalies acted as 'experiments' that could bring to light links between the brain and bodily movements.[31] Excited to contraction by the nervous system, the muscles of the body showed how the work of that system was carried out, as well as where it had malfunctioned. Asylum casebooks demonstrate the increasing confidence that asylum doctors had in movements of the limbs as indications of what was occurring beneath the surface of the skull. William H., whose left upper arm was flexed and left leg paralysed, was suggested to be suffering from an 'embolism … affecting the Corpus Striatum'.[32] Symptoms such as limb paralysis were signs, like mental derangement, of 'what [was] going on wrong, in the highest sensori-motor centres'.[33]

Although one may glean from such examples an impression of the muscles as 'servants' of the mind, the picture was not so straightforward, with physiological works often positing muscle as an independent entity. 'That the muscles possess a sensibility of their own', wrote Ferrier, '… is proved beyond all doubt by their nervous supply and by physiological and clinical research'.[34] The use of the term 'muscular sense' by Eduard Hitzig and Hermann Nothnagel (to describe how muscular contraction affected the muscles themselves) bestowed an almost anthropomorphic character upon this tissue: muscles became entities capable of action and reaction in response to external influences.[35] Muscles, then,

were rather similar in character to the ideal man: independent, capable of reasoned action and able to carry out appropriate responses to outside stimuli. Left to their own devices in the presence of corrupting influences, however, they ignored the rules of expected conduct and caused social embarrassment. A strong-willed man kept his muscles in check, and for theorists such as Darwin posture became a literal embodiment of evolutionary development.[36] The will, an elusive but enduring concept in nineteenth-century alienist science, was most forcefully expressed - or most notably absent - in the movements of the body. As the counterpart to primitive desire, the will represented higher evolutionary development, with an individual's willpower increasing with age.[37] The role of the healthy brain was to maintain control over the body and its actions. Jackson's theory of dissolution - an opposite process to evolution - illustrated this interaction between body and will. Dissolution of the nervous system, a concept explicitly linked to the evolutionary theory of Herbert Spencer, was evident when those movements or faculties which were last to be acquired - and most dependent on the will - were the first to be affected. The loss of finer movements such as those of the fingers suggested that the ability to perform complex motor abilities was a good indication of the brain's condition. On many asylum wards, one could see patients engaged in purposeless, mechanical activity that pointed to a grave prognosis. To Jackson, muscular atrophy, too, provided a visual representation of the degree of dissolution of the nervous centres and thus the 'amount' of evolution remaining. Such explanations for loss of control, by emphasising the co-existence of reflex action and the will, allowed mental science to move closer towards the realms of natural, biological science without discarding that essence of being human that marked men apart from other animals.[38] That abstract concepts such as the will were also seen as 'functions' and interpreted in a physiological light has led Michael J. Clark to describe late-Victorian medical psychology as a field that employed a language of '*sustained metaphysical ambiguity*' which allowed it to establish itself as a distinctive scientific culture

quite apart from the rest of medicine.[39] Willpower could, it was said, be weakened by several factors including poor nutrition and structural lesions; bodily actions could thus be explained in a mechanistic way - caused by physical factors - as well as the results of conscious manipulation by the mind.

The exterior of the body, as well as revealing underlying pathologies, could also reveal the lack of disease. Croydon Infirmary's Francis W. Clark related the case of a man admitted to the hospital who was suspected of shamming: 'When suggestions as to any heroic form of treatment (such as a cold douche) were made in his presence he came round far more rapidly than would otherwise have been the case'. His physical condition apparently confirmed that he was malingering, as he displayed no reflex abnormalities or muscle wastage.[40] There was a general belief, then, that bodily manifestations indicated a change in cerebral function, and that they could be used on this basis to formulate a diagnosis - or even a non-diagnosis in the case of shamming patients. A patient's movements served as an important diagnostic tool when their own verbal testimony was unreliable or impossible. In some cases, however, the voicing of delusions by the patient proved a useful indicator of subjective bodily experiences. Mickle suggested that disordered 'muscular sensibility' - the body's relation to its external environment - could be glimpsed in the characteristic grandiose delusions of the GPI patient. Thus, the declaration that one could 'lift millions of tons' was not necessarily an indicator of delusion, but of unusual bodily sensations.[41] The utility of spoken delusions as a key to understanding somatic experiences was limited by other bodily changes, though, that hindered the patient's power of articulation. In the case of Abraham B. the doctor noted that his speech was 'thick and rather indistinct', making it difficult to get much information from him.[42] Compensating for these difficulties, Abraham's body was coaxed into speaking for him: his 'patellar tendon reflex [was] absent in each limb; plantar reflex almost absent, no cremasteric reflex. Tactile sensibility of lower limb [was] diminished

in acuteness.'[43] Reflex tests, as Stephen Casper has recently shown, were a crucial part of the patient examination alongside other forms of testimony, and a place where practice was closely bound up with contemporary psychiatric theory.[44]

Softening and Swelling: General Paralysis after Death

As a practice to gather information about the body, the post-mortem was an increasingly popular means of formulating physical explanations for mental disease towards the end of the century. The importance accorded to the bodies of asylum patients can be glimpsed in appeals during the 1870s for post-mortems to be made a universal practice within institutions, and in the encouraging tone of the Commissioners in Lunacy regarding the number of post-mortems undertaken.[45] Despite the support of Crichton-Browne and others, efforts to institute universal post-mortems were rejected in 1877, though this did not mean that all asylums followed the same protocol with regard to the procedure.[46] At the West Riding, the intention to perform a post-mortem was made clear on the notice of admission sent to relatives:

> In case of death the usual post-mortem examination will be made in order to certify correctly the cause of death. Relatives in any case objecting to this course are requested to communicate immediately upon receipt of this notice, personally, with the Medical Superintendent.[47]

It is impossible to know how many families responded to this, but towards the end of the century it is clear that a number of friends and relatives were voicing their objection to the procedure, either wholly or in terms of the parts examined. Casebooks kept during the patient's life might be annotated 'Post mortem <u>objected</u> to',[48] and post-mortem records demonstrate some very specific ideas about where the boundaries of examination lay. Often the head was not permitted to be examined, with the thorax seen as a more acceptable area of investigation. Efforts to secure the bodies of patients for post-mortem investigation bring to

mind Eric Engstrom's description of the 'valuable neuropathogical specimens' recognized by German psychiatric clinics – patients who were offered free beds in order to obtain access to their bodies after death.[49] Whilst this raises many ethical issues, the asylum post-mortem was a practice central to the belief of many alienists that the solution to mental disease might be contained within the fabric of the body.

The previous section explored how the patient's living body was thought to reveal something of the nature of mental disease. The body could also 'speak' after death, however. Atrophied muscles were easily observed during life, but the underlying complexities of this process were revealed in vivid detail upon cutting open the body. Sectioning the muscles of one patient's torso at post-mortem, the pathologist recorded that they 'exhibit[ed] fatty infiltration & disintegration appearance [*sic*] like a mixture of red & white currant jam'.[50] Fat had long been seen as an indicator of individual self-control and, as emphasized by Christopher Forth and Ana Carden-Coyne, could have special significance for the male body. As well as the potentially feminising effects of excess body fat in an aesthetic sense, 'fat male bodies ... continually raised doubts about the "masculine" capacity to conquer appetites, brave hardships, and remain "active" in physical, sexual, and moral terms'.[51] Fat hidden away in the depths of the body raised similar anxieties. The swelling or softening of bodily tissues signalled the presence of 'parasite[s], rather than [workers], in the corporeal economy', and indeed post-mortem accounts often spoke of fat as a foreign substance that had been introduced into the body.[52] The post-mortem, then, frequently confirmed the disorderly nature of the general paralytic body that was initially observed in muscular anomalies during life. The post-mortem was not a practice concerned with simple flesh and bone, however, but an activity that fed into and was employed alongside other scientific practices such as microscopy. Pathologist Edwin Goodall, together with W. L. Ruxton of nearby Wadsley Asylum, examined the nerves of ten patients at the West Riding, nine suffering from GPI and

one whose diagnosis remained unclear. Portions of nerve were taken from the arm at post-mortem, hardened and stained.[53] Two mounted photomicrographs in the photograph album are those reproduced in Goodall and Ruxton's final article, demonstrating John Pickstone's point that physiology and microscopy (and in this case, post-mortem investigation) often went hand in hand.[54] Goodall and Ruxton's findings emphasized the anomalous appearances of affected muscle tissue: 'masses' of connective tissue; 'swollen' nerve fibres; 'congested [blood] vessels', and a general impression of 'fatty change'.

As well as changes to the muscular fabric, the post-mortem uncovered similar alterations in the major organs. Hearts were 'macerable and pale, externally overloaded with fat'; livers 'flabby'.[55] As the root of the problem, though, the brain was of primary concern: upon opening the skull at post-mortem, it was an organ that could present startling changes, traversed by 'engorged' blood vessels or dotted with 'fatty granules'.[56] The most immediately evident of these changes was cerebral softening. 'The whole brain is much reduced in consistence', noted one post-mortem report, 'the hemispheres and sulci gape widely, and the corpus callosum tend to tear'.[57] Like the muscles, the brain was susceptible to degenerative, softening influences.

Softening processes in the brain were maddening to the medical observer, transforming the material under study into an unruly, sloppy mess. How was the doctor to tame such tissue for investigation? William Bevan Lewis, then Senior Medical Assistant at the West Riding asylum, instructed students on the matter in a series of articles on 'Methods of Preparing, Demonstrating, and Examining Cerebral Structure in Health and Disease'. Discussing the 'physical properties of grey and white matter', he emphasized the importance of the student's own senses in observation: there was, he said, 'no more exact gauge of consistence of texture than the rough-and-ready methods afforded by the sense of sight and touch'.[58] Here, he described the key differences between a normal brain and the softened,

diseased brain: whilst the former was plump and rounded, the latter was flattened when removed from the skull, with 'flabby' convolutions and little resistance to pressure. 'Let the student examine the brain of an advanced general paralytic', noted Bevan Lewis, 'and he will find this condition well represented.'[59]

Despite clear interest in these brains, they proved difficult to preserve. Bevan Lewis urged caution when dealing with softened specimens: 'the brain-tissue clings to the blade with unusual tenacity ... As a result the cerebral tissues ... are lacerated and tear away in shreds, leaving an unmistakable softened rottened [*sic*] aspect of the surface'.[60] Post-mortem reports repeatedly testified to the challenges of handling the softened brain, which eluded the investigator's attempts to preserve it for teaching purposes. To study GPI successfully, it was necessary to overcome such obstacles. Crichton-Browne recommended submerging the brain in acid, which simultaneously hardened the brain substance and ate away the thinner membranes. By soaking brains in this way, the outer membranes were consumed, leaving the convolutions of the brain intact and ready for further study in a preserved form.[61]

Making the brain suitable for study depended on a whole range of other increasingly sophisticated equipment too. The freehand sectioning or stripping (with, for example, a needle) of the brain tissue that had been predominant in the 1870s generally gave way to serial sectioning by the 1880s. Serial sectioning - cutting tissue into a series of thin slices - was a practice both important to and contingent upon a new view of the brain in the later nineteenth century, with the structural fabric of the organ examined in increasing detail.[62] Sections could be cut using a razor or knife, but the introduction of the microtome made light work of a lengthy chore. Simple hand microtomes were 'little more than a metal tube that [held] the embedded specimen and whose edges support[ed] the knife or the razor',[63] but a whole host of modified versions followed. Bevan Lewis's freezing microtome, concomitant with similar innovations by Richard Hughes in Manchester and William Rutherford in

London, used ether to freeze samples for cutting.[64] Freezing tissues prevented distortion under the scalpel, as well as removing the need for hardening a specimen - a process that could take months depending on the method used. Though the freezing method seemed an ideal solution to the problem of the general paralytic brain, extremely softened specimens might not be tamed by such methods. One post-mortem report noted: 'The cortex … shewed [*sic*] to the naked eye a decidedly yellowish tinge, was abnormally softened & it was with difficulty that sections cut on the freezing microtome could be kept from breaking up in water'.[65] Sometimes the best that could be hoped for was obtaining 'a little of the creamy pulp upon the scalpel, and transferring it to a slide' for microscopical examination.[66] Softening of the brain was a phenomenon with particular significance for the study of mental disease, and one that inspired a variety of instruments and techniques to deal with its problematic substance. In this sense, the brain substance was a material very much 'actively engaged in the enactment of reality':[67] it had a direct material impact on asylum practices and became a key component of the profile of GPI.

Alongside cerebral softening, post-mortem examinations revealed another form of liquescent degeneration: the brains of general paralytic patients were often surrounded by an unusual amount of cerebro-spinal fluid (CSF), with some doctors reporting as much as one and a half pints. The superintendent of one asylum offered a neat explanation for this that harked back to ideas of humoral balance in the body:

> As the cranium is a closed box, and its contents always completely fill it, when the active agent, the blood, increases or diminishes in amount, the passive agent, the cerebro-spinal fluid, must alter in amount inversely, the brain substance being regarded as neutral.[68]

At this time the body was seen as a finely-balanced system that had to be kept in a state of equilibrium if health was to be maintained. An 1892 piece in the *Lancet* graphically

illustrated the notion of balance as applied to the brain, theorising that cerebral pressure had the effect of hindering respiration. A patient, on the operating table for the removal of a brain tumour, stopped breathing, whereupon the surgeon 'punctured the brain, and witnessed the gratifying return of respiration *in proportion* as the pus flowed out'.[69] The exchange of brain mass for fluid, then, fitted in to a wider picture of dynamic exchange within the body, with the fixed energy model extended to the materials of the body. It was a picture subverted by the body of the general paralytic patient, however, where the maintenance of equilibrium quickly descended into chaos, with the production of large amounts of fluid in the skull causing problems. The post-mortem, by uncovering the turmoil beneath the surface of the skin, underscored GPI's dramatic impact on the physical fabric of the body. In laying bare the degenerative processes taking place, post-mortem findings could also be linked to wider issues of morality and health, with the general paralytic body testifying to its owner's past actions.

Vectors of Disease: The General Paralytic Patient and Morality

Just as Edward Shorter has used gait disorders to shed light on conceptions of hysteria,[70] concerns for processes such as muscle wastage and brain softening in GPI are a way in to considering both contemporary psychiatric theory and wider social mores. General paralysis was a prime example of how 'the language of disease continually aligns pathological processes with social forces'.[71] The features of the general paralytic body - atrophy, softening of tissue, large quantities of CSF - were stark symbols of waste and decay, and fitted neatly into the nineteenth-century conception of health in which 'those who [were] wasteful [would] waste themselves away'.[72] Softened bodies that suggested lives of apathy, laziness, or cowardice stood in direct opposition to the ideal 'hard' man whose tough body spoke of activity.[73] They were bodies that implied a failure to look after oneself that was opposed to

the ideal of the controlled, self-regulating man, with unnatural changes signalling a body at odds with its environment. The disordered male body was an anomaly, yet at the same time it was crucial to imagining order - in demonstrating the deviant body, it painted a clear picture of the desired ideal.[74]

If muscle was 'good', then muscular weakness or atrophy could be conceptualized as somehow amoral: the wasted body reflected the actions of its owner. General paralytic patients were strongly implicated in the aetiology of their disease, with their muscular conditions rendering them powerless to claim otherwise. Clinical cases related in contemporary journals might explicitly link bodily changes with immoral behaviour. A. C., whose case was reported in *Brain* in 1888, was said to have suffered a 'paralytic stroke', exhibiting a lack of deep reflexes, staggering gait, atonic calf muscles and numbness of the left foot. The attack and its effects were neatly linked to A. C.'s change in character: he appeared 'half dressed' in the street, used foul language and engaged in 'reckless debauchery'.[75] The 'depressed type of symptoms points, to a certain extent,' wrote author F. St. John Bullen, 'to an etiology in sexual excess, alcohol, and syphilis. The two latter especially of all, tend to produce a vitiation of nerve tissue and an intellectual and moral deprivation.'[76] Like the 'spermatic economy',[77] muscle might be used up by a man's immoral over-exertions, and the depleted body of the general paralytic stand as testament to the harmful effects of modern society.

As this chapter has also shown, deep-seated changes within the body were 'surfaced' by the post-mortem,[78] where fatty muscle tissue and softened brains were added to the list of anomalies present in the general paralytic body. If waste products were 'fundamental to the ordering of the self',[79] then the general paralytic was a profoundly disordered soul. Excess CSF found in the skull at post-mortem can be seen as a very literal symbol of the 'chaotic liquidity of the male psyche' during the Victorian era.[80] Pamela Gilbert suggests that

divisions between health and illness were constantly threatened by this liquidity, which threatened to 'burst out' and 'sink [those around] the individual', with a single body capable of posing a threat to the wider social body.[81]

In the case of the general paralytic patient who - even before the twentieth century connection of GPI and syphilis - was considered an over-indulger in alcohol and sex, this notion of social threat was particularly relevant. Though the disfiguring transformations of the body and subjective experiences of the sufferer allowed the patient to be seen as victim as well as vector,[82] it was the latter that characterized most discussions of GPI. In this sense the general paralytic patient resembles the transgressive member of the Nuer tribe studied by Mary Douglas in *Purity and Danger* (1970). The prohibition of incest among the Nuer was bolstered by the belief that any breaking of this rule would be punished in the form of visible skin disease. Like the infectious general paralytic man who endangered the health of his wife and children, 'the [Nuer] polluter [was] a doubly wicked object of reprobation, first because he crossed the line and second because he endangered others'.[83] The general paralytic patient's transgression was punished in many varied and subtle ways, as the interior of the body steadily deteriorated to the point where post-mortem reports conveyed an image of one gelatinous, self-spawning mass. The breakdown of the bodily fabric encapsulated that 'fear of collapse, the sense of dissolution, which contaminates the Western image of all diseases', in which the patient became the disease anthropomorphized.[84]

Although considered a potential vector of disease in both social and medical terms, the discourse surrounding GPI did not discard older ideas about the hereditary nature of mental disease. Though we may be inclined to draw a clear line between the climate of the 1890s and that of the early twentieth century, 'a continuous structure' existed 'of what might be called the predisposed body, the body between danger and disease'.[85] Advances in bacteriology did not push the idea of innate susceptibility from alienist minds, but rather were

successfully drafted into existing paradigms in order to provide a more detailed aetiological explanation of mental disease. The body of the general paralytic patient constitutes a classic example of this, demonstrating how seemingly disparate explanations of mental disease were able to co-exist within one body, and within alienist discourse. The notion of predisposition could be reconciled with laboratory-based findings, for example, such as J.O. Wakelin Barratt's investigation into the production of false membranes in 1902. False membranes were further evidence of the chaos that reigned within the general paralytic body, 'consist[ing] of a very delicate, more or less grey or brownish-grey oedematous layer, lying upon, and adherent to, the inner surface of the dura mater, and exhibiting large thin-walled dilated vessels together with extravasations of blood'.[86] Barratt's research consisted of '[p]ortions of subdural membranes varying in size from a pin's head to that of a hemp seed ... [being] placed in the subdural space of cats and dogs, being introduced through a small slit in the dura mater'.[87] Examining the animals several weeks later, no progressive changes could be seen – sometimes the implanted membrane had disappeared altogether. Barratt concluded it was impossible to set up the process of membrane formation in healthy brains, suggesting that although general paralytic patients exhibited broadly similar pathological changes, they were changes that also depended upon an already fertile soil.

By the early years of the twentieth century, then, in an era apparently in the grip of 'Bacteriomania',[88] longer-standing ideas about the aetiology of insanity continued to exercise considerable influence. In the apparent incongruity between lesion-based medicine and hereditary theory was an area in which the patient, the doctor and wider society came together in a way that was logical considering GPI's impact upon the self, the medical profession and public perceptions of disease. By examining more closely the appearances and products that were thought to characterize the general paralytic body, it is possible to begin to bridge the divide between social histories of the disease and those that focus on its scientific

investigation. As a condition in which the medical and social worlds were intimately linked, GPI presented an ideal opportunity for alienists to prove their professional worth, evidenced by the astonishing number of experiments and instruments brought to bear upon the body and bodily products of the general paralytic patient. Although asylum doctors were hopeful that GPI would serve as a model of mental disease, it was a condition that proved difficult to investigate (the softened substance of the brain, for example). Such difficulties - alongside the need to address a chronic disease that affected large numbers of patients - inspired detailed and often novel examination techniques, some of which are described in this chapter. Throughout these investigations, the body was found to be a profoundly unstable entity in its capacity to succumb to degenerative processes.[89] In these processes, GPI literally embodied contemporary concerns about modern life, dangerous sexualities, and the importance of self-control, demonstrating the potentially fatal risks that modern life presented to the man who allowed his baser appetites to overcome his higher functions.

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[1] E. O'Connor, *Raw Material: Producing Pathology in Victorian Culture* (Durham, NC: Duke University Press, 2000), pp. 60–101.
[2] See M. A. Budd, *The Sculpture Machine: Physical Culture and Body Politics in the Age of Empire* (Basingstoke: Macmillan Press Ltd., 1997), p. 61.
[3] R. S. Stewart, 'The Increase of General Paralysis in England and Wales: Its Causes and Significance', *Journal of Mental Science*, 42 (1896), pp. 760–77, on p. 761 (fn).
[4] H. Marland, 'Disappointment and Desolation: Women, Doctors, and Interpretations of Puerperal Insanity in the Nineteenth Century', *History of Psychiatry*, 14:3 (2003); J. Busfield, 'Class and Gender in Twentieth-Century British Psychiatry: Shell-Shock and Psychopathic Disorder', in J. Andrews and A. Digby (eds), *Sex and Seclusion, Class and Custody: Perspectives on Gender and Class in the History of British and Irish Psychiatry* (Amsterdam: Rodopi, 2004), pp. 295–322; J. Oppenheim, *"Shattered Nerves": Doctors, Patients, and Depression in Victorian England* (New York: Oxford University Press, 1991).
[5] F. W. Mott, 'Observations upon the Etiology and Pathology of General Paralysis', *Archives of Neurology from the Pathological Laboratory of the London Co. Asylums*, 1 (1899), pp. 166–203, on p. 168.
[6] See for example J. Wiglesworth, 'General Paralysis Occurring about the Period of Puberty', *Journal of Mental Science*, 39 (1893), pp. 355–67.
[7] Stewart, 'Increase of General Paralysis', p. 776.

[8] L. Fleck, *Genesis and Development of a Scientific Fact*, trans. F. Bradley and T. J. Trenn (Chicago: University of Chicago Press, 1979 (1935)).
[9] Ibid.
[10] Report of the Superintendent, 30 January 1873, West Yorkshire Archive Service, Wakefield, Stanley Royd Hospital archives (hereafter WYAS SRH), C85/1/12/3, p. 27.
[11] West Riding Pauper Lunatic Asylum, *Report of the Sub-Committee and of the Medical Superintendent of the West Riding Pauper Lunatic Asylum, Wakefield, for the year 1895* (Wakefield: West Yorkshire Printing Co. Ltd, 1896), p. 11.
[12] One patient 'at times [swore] loudly when he [was] irritated by his auditory hallucinations'. Male medical casebook M39, WYAS SRH C85/3/6/133, p. 552. Also see K. M. Brian, ''Occasionally heard to be answering voices': Aural Culture and the Ritual of Psychiatric Audition, 1877–1911', *History of Psychiatry*, 23:3 (2012), pp. 305–17.
[13] Male medical casebook M32, WYAS SRH C85/3/6/126, p. 34; Male medical casebook M46, WYAS SRH C85/3/6/140, p. 434.
[14] W. Bevan Lewis, *A Text-book of Mental Diseases: with Special Reference to the Pathological Aspects of Insanity* (London: Charles Griffin, 1889), p. 521.
[15] Photographs of male and female patients, WYAS SRH C85/1111.
[16] Charcot's knee was a condition characterized by severely swollen joints; although any part of the body could be affected, knees and ankles were the most common manifestations.
[17] Male medical casebook M39, WYAS SRH C85/3/6/133, p. 634.
[18] Male medical casebook M40, WYAS SRH C85/3/6/134, p. 58.
[19] Male medical casebook M25, WYAS SRH C85/3/6/119, pp. 463–65.
[20] Male medical casebook M52, WYAS SRH C85/3/6/146, p. 73.
[21] Male medical casebook M53, WYAS SRH C85/3/6/147, p. 457.
[22] Male medical casebook M46, WYAS SRH C85/3/6/140, p. 475.
[23] C. Shilling, 'Educating the Body: Physical Capital and the Production of Social Inequalities', *Sociology*, 25:4 (1991), pp. 653–72, on p. 654.
[24] Helmholtz's work emphasized that energy could not be generated or destroyed, but remained constant. Clausius theorized that the entropy (ways in which a system could be arranged) of a closed system never decreased. A. Rabinbach, *The Human Motor: Energy, Fatigue, and the Origins of Modernity* (New York: Basic Books, 1990), p. 3.
[25] G. L. Geison, *Michael Foster and the Cambridge School of Physiology: The Scientific Enterprise in Late Victorian Society* (Princeton, NJ: Princeton University Press, 1978), p. 335.
[26] Rabinbach, *Human Motor*, p. 125, p. 134.
[27] Male medical casebook M26, WYAS SRH C85/3/6/120, p. 557–60, p. 576.
[28] Bevan Lewis, *Text-book of Mental Diseases*, p. 262.
[29] C. F. Newcombe, 'Epileptiform Seizures in General Paralysis', *West Riding Lunatic Asylum Medical Reports*, 5 (1875), pp. 198–226, on p. 205.
[30] J. H. Jackson, 'Notes on the Physiology and Pathology of the Nervous System', *Medical Times and Gazette*, 2 (1868). Cited in G. K. York and D. A. Steinberg, 'An Introduction to the Life and Work of John Hughlings Jackson with a Catalogue Raisonné of his Writings', *Medical History*, supplement 26 (2006), p. 15.
[31] J. H. Jackson, 'On the Anatomical and Physiological Localisation of Movements in the Brain', in J. Taylor, G. Holmes and F. M. R. Walshe (eds), *Selected Writings of John Hughlings Jackson Vol. 1. On Epilepsy and Epileptiform Convulsions* (London: Hodder and Stoughton, 1931), pp. 37–76, on p. 63.
[32] Male medical casebook M41, WYAS SRH C85/3/6/135, p. 118.
[33] J. H. Jackson, 'Remarks on Evolution and Dissolution of the Nervous System', *Journal of Mental Science,* 33 (1887), p. 39.
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[35] E. Hitzig, *Untersuchungen über das Gehirn: Abhandlungen Physiologischen und Pathologischen Inhalts* (Berlin: A. Hirschwald, 1874); H. Nothnagel, 'Experimentelle Untersuchungen über die Functionen des Gehirns', *Virchows Archiv*, 57:2 (1873), pp. 184–214; 58:3/4 (1873), pp. 368–78. Cited in Ferrier, *Functions of the Brain*, p. 379.
[36] S. Gilman, '"Stand up Straight": Notes Toward a History of Posture', *Journal of Medical Humanities*, 35:1 (2014), pp. 57–83, on p. 64.
[37] Rabinbach, *Human Motor*, pp. 166–67.
[38] L. S. Jacyna, 'Somatic theories of mind and the interests of medicine in Britain, 1850–1879', *Medical History*, 26:3 (1982).

[39] Emphasis in original. M. J. Clark, 'A plastic power ministering to organisation': Interpretations of the Mind-Body Relation in Late Nineteenth-Century British Psychiatry', *Psychological Medicine*, 13:3 (1983), pp. 487–97, on pp. 490–91.
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[41] W. J. Mickle, *General Paralysis of the Insane* (London: H. K. Lewis, 1886 (1880)), p. 71.
[42] Male medical casebook M39, WYAS SRH C85/3/6/133, p. 211, p. 209.
[43] Ibid., p. 211.
[44] S. T. Casper, 'The Patient's Pitch: The Neurologist, the Tuning Fork, and Textbook Knowledge', in L .S. Jacyna and S. T. Casper (eds), *The Neurological Patient in History* (Rochester, NY: University of Rochester Press, 2012), pp. 21–43.
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[48] Emphasis in original. Male medical casebook M86, WYAS SRH C85/3/6/180, p. 409, p. 373.
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[57] Post-mortem reports vol. 7, WYAS SRH C85/1124, p. 459.
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[65] Post-mortem reports on brains of several patients, with name index, WYAS SRH C85/1207, p. 5.
[66] Bevan Lewis, 'Methods', p. 515.
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[71] O'Connor, *Raw Material*, p. 4.
[72] Ibid., p. 4, p. 5. O'Connor is here discussing John Ruskin, who coined the term 'illth' to refer to the physical decay associated with economic development. See J. Ruskin, *"Unto this Last": Four Essays on the First Principles of Political Economy* (New York: John Wiley and Son, 1866).

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[87] Ibid., p. 199.
[88] M. Worboys, 'Was there a Bacteriological Revolution in Late Nineteenth-Century Medicine?', *Studies in History and Philosophy of Biological and Biomedical Sciences*, 38:1 (2007), pp. 20–42, on p. 27.
[89] On this idea of bodily instability, see Huff, 'Corporeal Economies'.