

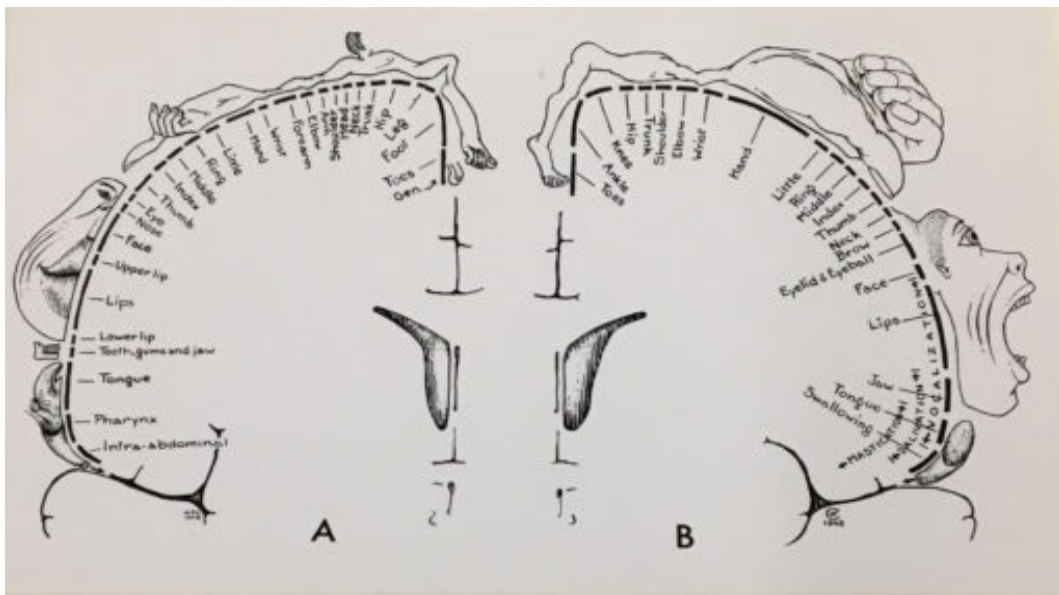
<http://somatosphere.net/2019/homunculus-revolts-re-figuring-the-neurological-subject.html/>

homunculus Revolts: Re-Figuring the Neurological Subject

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By Zoë Wool

Figuring a Grotesque Norm



1954 Homunculus: Penfield Archives, Osler Library of the History of Medicine

This hand drawn illustration rendered in black ink shows two mirror image outlines of cross sections of the cerebral cortex comprised of segmented lines each of which is labeled with the part of the body to which that part of the brain corresponds. Curving around the surface of each outline are the sensory (on the left) and motor (on the right) homunculi, distorted nude human figures with elongated feet, massive hands, massive faces with huge lips and mouth separated from their bodies, and various parts of the alimentary system represented below the chin. The sensory homunculus also has a scrotum and uncircumcised penis beneath its feet. The heads of each seem to have shorn hair, and musculature and features coded as male.

As a standard feature of anatomy, physiology, and neuroscience text books, the image of the cortical homunculus will be familiar to you if you've ever taken courses in anatomy, cognitive science, or neurology. If

not, you might recognize the image from its frequent appearance in popular science accounts of human motor and sensory processes. Whichever representation of the homunculus you've encountered, it is descended from figures created by Wilder Penfield, the visionary mid-20th century neurologist whose work was critical to the shaping of neurology as a field of medicine in its own right.



Operating Theater: William Feindel (2007), "The physiologist and the neurosurgeon: the enduring influence of Charles Sherrington on the career of Wilder Penfield" *Brain*. 130(11): 2758–2765.

A black and white photograph of Wilder Penfield's complicated operating theatre apparatus in use during brain surgery. In the center of the image is a white male patient, lying on his side on an operating table, surrounded by a tent-like arrangement of surgical sheets which is supported by a partly-visible metal scaffold. Wilder Penfield and three other clinicians, all of whom also appear to be white men, indistinguishable in surgical gowns, caps, and masks, surround the patient. The patient holds the hand of one clinician, while Penfield and the other two stand behind him focused on his head. They are all surrounded by a number of lights and an angled mirror. In the background in an elevated glassed-off chamber, Penfield's colleague, another white man, Herbert Jasper, stands in a white coat, vest, shirt, and tie, examining the readout of an electrocorticogram.

The original figures of the cortical homunculus were based on correlated data from 163 cases in which Penfield and his team used direct electrical stimulation of the cortex to locate various motor and sensory functions in anesthetized but fully awake patients who were undergoing surgical removal of invasive brain tumors or scar tissue that was causing epileptic seizures and other symptoms. As historian Katja Geunther (2015) has

noted, while these explorations in localization were at first only clinical, Penfield soon noted an emerging significance for brain research—that if the data were correlated according to the anatomical landmarks of *The Brain* (rather than *this* brain or *that* one), they might yield a standardized map of bodily motion and sensation (Guenther 2015, 164–67).

Perhaps the most popular result of Penfield’s endeavours to map out motor and sensory functions in *The Brain* is the image of the cortical homunculus shown above, which appeared in the 1950 book *The Cerebral Cortex of Man* (Penfield and Rasmussen 1950), an image that is the archetype for those we see in textbooks and magazines today. Comprised of a vertically bisected human figure marked as male (most notably by his genitals), the two halves of the homunculus are splayed over the motor and sensory cortices, respectively. The figure’s features are stretched, skewed, and reoriented to represent the general localization and amount of cortical real estate that different body parts take up in *The Brain*. The two halves of the figure’s body are subtly different, but they also correspond in many ways. The feet of both figures dangle down into the longitudinal fissure, while their torsos lay extended across the gyri with arms outstretched overhead. Both figures are decapitated, their faces relocated and inverted just beyond the reach of the extended thumbs of their massive hands, hands roughly the size of the whole torso. The faces are also massive, bigger even than the hands. They both have huge lips; the motor homunculus in particular has huge bulging eyes. Their tongues reside outside the faces altogether, resting beneath the chin. The sensory homunculus has a penis and scrotum that dangle down beneath the toes of his dramatically elongated foot.

Wilder Penfield wrote of the homunculus as a “figurine” and described the two halves as “twined,” playing on the literal meaning of homunculus—“little man”—in personifying him. But these personifications are hardly affectionate. Penfield also called the homunculus “grotesque,” and in an exchange with his colleague Sir Frances Walshe, who called the homunculus “a rather deceptive monstrosity” and suggested Penfield consider doing away with it by “infanticide,” Penfield said “I would kill the damn thing if I could” (cited in Guenther 2015, 156). It is something of this sense of the homunculus as a simultaneously standardized and troubling figure that I think makes him so productive.

The figure of the homunculus has new stories to tell about normative biomedical bodies and the imbrication of gender, disability, race, and class in their renderings. In particular, critical scholarship of biomedical psy/sciences, especially feminist work, offers many accounts of the ways biomedical renderings of the *normal* body or brain both reflect and constitute socially *normative* ideologies of embodiment and personhood (Grosz 1994; Moore and Clarke 1995). But while the homunculus

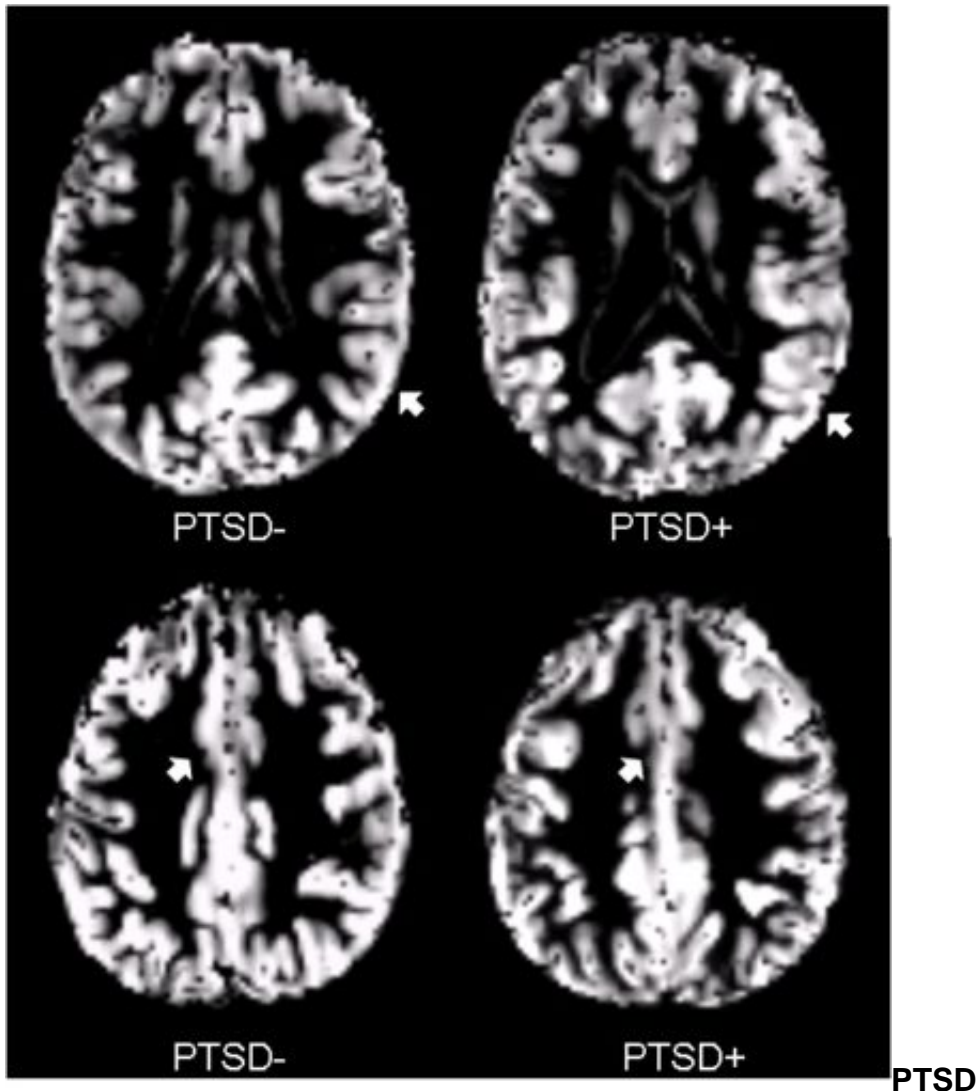
represents normal neurological anatomy, it is anything but normative in the social sense. Rather, the homunculus is often met with revulsion and described as “grotesque,” “monstrous,” or “horrific.” This productive friction between the normal and the normative that comes from the homunculus’ status as both standardized and revolting is one of two meanings I invoke in titling this project “homunculus revolts.” This revolting figure points to new critical paths through which to consider normativity and biomedicine, including what Ellen Samuels (2014) calls “fantasies of identification,” that is, the fantasy that forms of social difference — particularly race, gender, and disability — can be identified in the body through the mobilization of scientific — often medical — processes of certification.

The homunculus is sometimes considered insignificant by experts in the field. Katja Guenther notes that when she indicated her interest in the homunculus to William Feindel — former director of the Montreal Neurological Clinic which Penfield founded — “he exclaimed ‘ah, that silly thing’”(Guenther 2015, 156). When I first presented on this project, Laurence Kirmayer — director of the Division of Social and Transcultural Psychiatry at McGill University — suggested that the homunculus had minimal significance, describing it as merely “a heuristic” mostly used for students. Indeed, the figure is often dismissed in similar terms, as purely artistic, as little more than a mnemonic device, as just a map (Schott 1993; Snyder and Whitaker 2013; cf Guenther 2015, 156–57).

But brain maps are seductive, both for those of us who encounter them in classrooms and popular culture and for the cartographers who make them (e.g. Ramachandran and Blakeslee 1998, 39; cf Crawford 2014, 160). Of course, the correspondence of map and territory is tricky stuff, and the more abstraction gives way to closer and more exact correspondence, the more likely there is to be an effacement of the difference between the two. We need think only of Jorge Luis Borge’s “On Exactitude in Science” to remind ourselves of the absurdities of such an effort (Borges 1964, cf Carroll 1895). Lest we find ourselves naturalizing the cartographic imaginary and its ontological narrowness, we might think of [Lan Li’s work](#) on the distinctions between anatomical bodymaps—which fix and foreclose our understanding of the body’s invisible anatomy through correspondence with the visible anatomy — and Chinese *tu* — which diagrammatically open up interpretation of the invisible without anatomically pinning it down.

With this problem of map and territory, I mean to index both the broader issue of representation and/as reality and the more specific issue of graphic neuroscientific representations of the brain, which are treated as the brain itself, thereby erasing the multiple practices of inscription and forms of (social, technical, political) mediation involved in translating brains

into images (Dumit 2004; Saunders 2008; cf Latour and Woolgar 1986 on inscription and erasure). This has contributed to a widespread fetishization of the brain image (eg Rapp 2003).



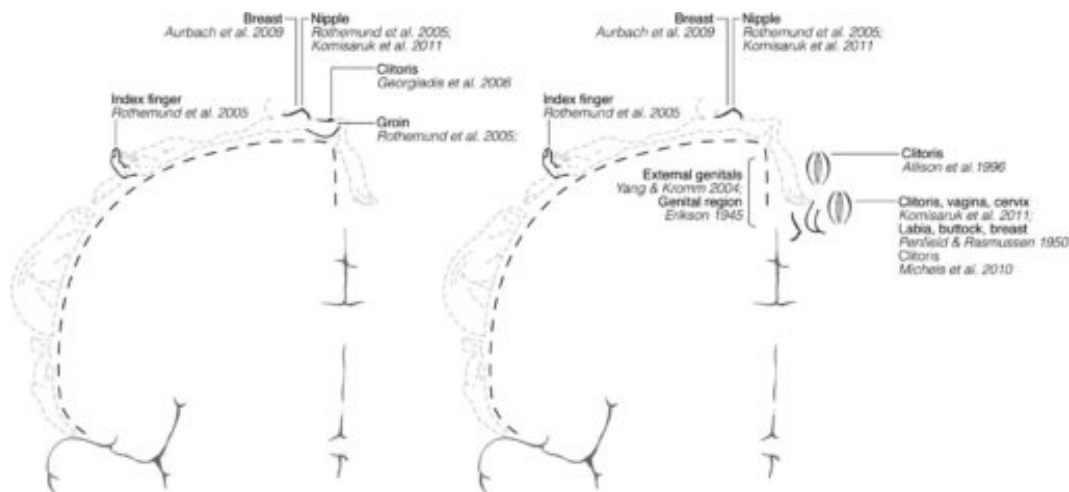
fMRI: Schuff et al (2011). "Patterns Of Altered Cortical Perfusion And Diminished Subcortical Integrity In Posttraumatic Stress Disorder: A MRI Study" *Neuroimage* January (54S1): S62–S68.

An arrangement of four black and white fMRI brain images, in which various parts of the brain are visible in various shades of white and grey. The illustration is part of an article intended to demonstrate functional differences in the brains of US soldiers with and without PTSD diagnoses. With white slightly pixilated letters, the two fMRI images on the left side are labelled PTSD- and the two on the right are labelled PTSD+. Each image has one wide stubby white arrow pointing to locations intended to illustrate a difference between the "PTSD+" and "PTSD" brain images.

While the homunculus is kin to the broader family of brain maps and

Brain” *Scientific American* (241)3:180-201.

This illustration from a Scientific American article on brain specialization looks much like the original 1950 homunculus, though the outline of the brain is rendered in a thick pink undulating line, and the faces of both the sensory and motor homunculi are rendered in more detail, and therefore appear slightly more ‘realistic’ rather than figural. Another key difference is that the motor homunculus is feminized by the rendering of a breast on the torso and bangs, rather than the shorn head of the sensory homunculus.



Hermunculus: Di Noto et. al. (2013). “The Hermunculus: What Is Known about the Representation of the Female Body in the Brain?” *Cerebral Cortex*, 23(5):1005–1013.

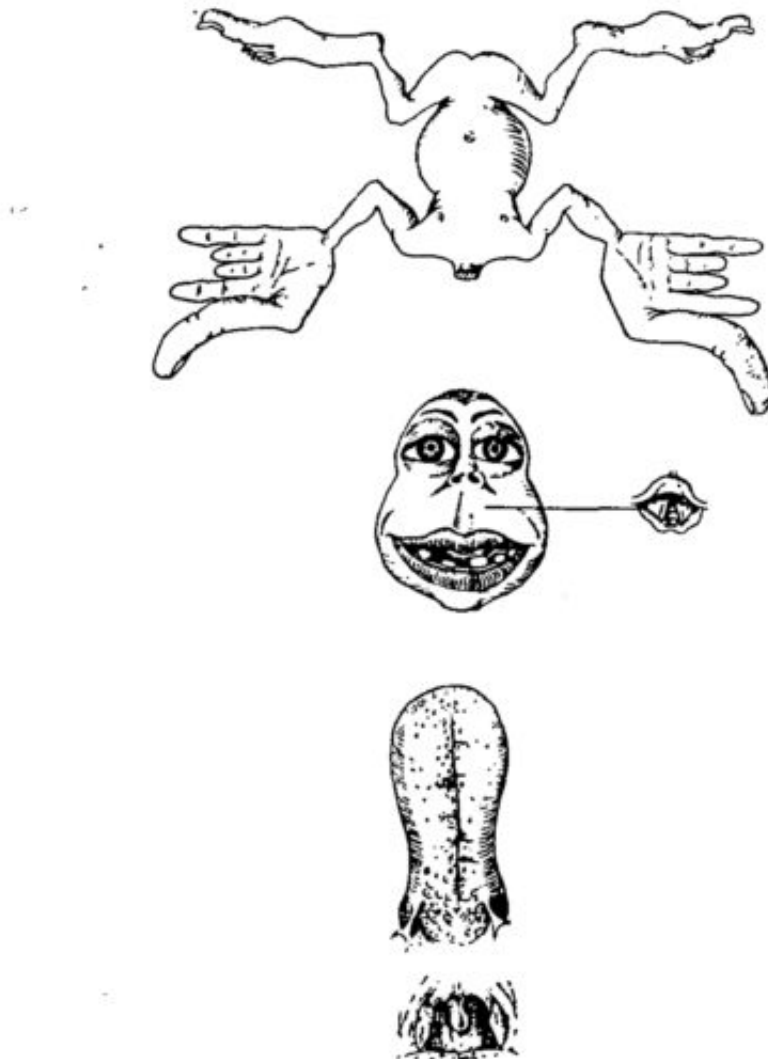
This illustration comes from a meta-analysis of research attempting to map a specifically female cortical anatomy. The contours of the cortex are shown in a black hashed line, and the outline of Penfield’s 1950 motor and sensory homunculi each appear in a dotted light grey. Overlaid onto that 1950 outline are solid black line renderings of parts of the body which researchers suggest are specifically female, or which demonstrate sex-specific cortical localization, including the index finger, breast, nipple, clitoris, labia, and groin. These parts are named and labelled with the citation of the research article that suggests their sex-specific cortical response.

But these efforts to remediate the generic maleness of the neurological body leave much to be desired. First, they uncritically reproduce the ‘discontents’ of theories of brain localization (Guenther 2015). In hinging gender to genitals, they double down on the biologization of a binary model of gender. And, in suggesting a single normal female cortical anatomy, they participate in the pathologization of difference. What’s more, while the standard feminist critique of such generic maleness remains fundamental, it also obscures the imbrications of race, gender, class, and disability essential to understanding how, exactly, normativity is

coordinated.

To understand that, I return to a point I made before: that the figure of the homunculus could have been otherwise and that his particularities have something to tell us about the imbrication of race, gender, class, and disability in the inscription of the neurological subject.

As it happens, the homunculus *was* otherwise. The iconic 1954 version that seems to be the progenitor of all those that followed is, in fact, the twinned offspring of an earlier ancestor. In 1937 Wilder Penfield and Edwin Boldery published an article called “Somatic Motor and Sensory Representation” in the journal *Brain*. This article would become the basis for Penfield’s 1954 book in which the more familiar homunculus first appeared. But the article offered a rather different homunculus, one Penfield called a “grotesque creature” (Penfield and Boldery 1937, 431–32).



1937 Homunculus: Penfield Archives, Osler Library of the History of Medicine

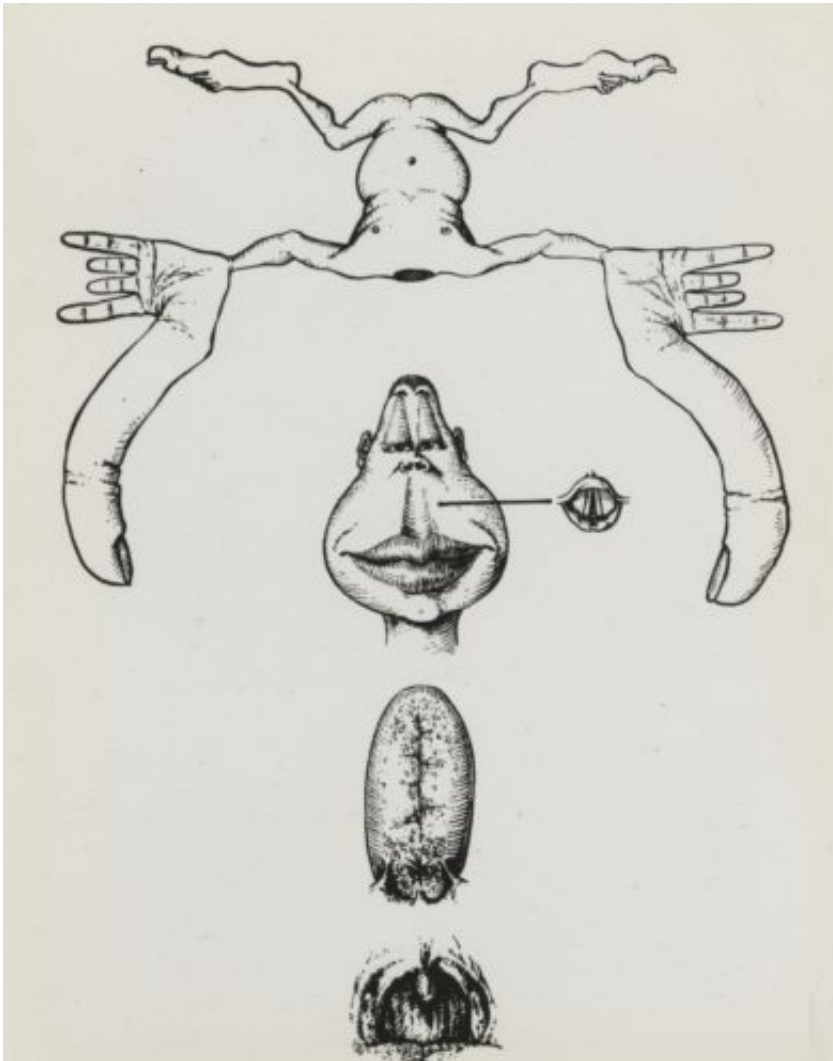
A single combined somatosensory homunculus, this cartoonish black ink rendering from Penfield's 1937 article on cortical localization shows an inverted body pot-bellied and splayed legs, absent of any genitalia. It has long feet, particularly the big toes, which have long overhanging toenails, and large hands with small middle and ring fingers and oversized curving thumbs. In the center of the image is a head with large hooded eyes, a small upturned nose, and a large gap-toothed grin. It's dark hair is shorn and comes to a widows peak on the forehead. Below that is a large tongue and beneath that is the interior of a mouth with dangling uvula.

A single combined somatosensory homunculus, the figure is almost comical. Its inverted body is pot-bellied and splayed (spatchcocked, I am always tempted to say), hovering above its decapitated head. The head floats in the center of the image with large hooded eyes and an inexplicably gap-toothed grin. Below is a large, disembodied tongue and at the bottom, a view into the mouth with a dangling uvula. The figure's maleness is suggested primarily in the absence of breasts. The genitalia are not pictured. So this figure is rendered as both male and emasculated.

We might say that this representation entails an erasure of the experiential body of the female subject. This is true, but also rubs up against the presence of Penfield's female patients who quite literally speak in the text. "M.G. a girl aged 21? (1937, 398), for example, describes one sensory response in her hands and feet as "like going to sleep." She, like all the patients, is relied on as a collaborator and in fact, Penfield credits them collectively as the "other authors" of his 1954 book. It is also worth noting that both illustrations were created by Hortense Cantlie, a woman who worked extensively with Penfield and was trained at the renowned program in Art as Applied to Medicine at Johns Hopkins under its founder, Max Brödel.

What's more, the maleness of this figure can hardly be described as normative, both because of his emasculation, and because the normative maleness of "neuro and psycho-physiology" is normative, it is also coded as white and fit. However, this figure is not quite either of those things. His whiteness is complicated by the particular distortions of his face, some of which are guided by Penfield's observations, such as the large hands, eyes, and lips and elongated upper lip. When combined together, these features of the homunculus overlap with those of the 19th century anthropometry, physiognomy, and anthropology of race, which are very much still with us, and in which such supposedly simian characteristics are made to be indicators of the great evolutionary and civilizational chain of intelligence and racial types — they are fantasies of identification in Ellen Samuels' sense.

In Penfield's extensive archive housed in the Osler collections at McGill University, the boxes pertaining to the 1937 article also contain an earlier draft of the illustration which was never published. With its pin head that seems to be topped by short cropped fuzzy black hair, elongated hooded eyes, large fleshy cheeks, massive smirking lips, slightly protruding ears, and contour shading that gives the impression of darker skin, it is hard not to look at this image and see a violent history of racist and eugenicist medical images of Black subjects, represented as small brained, dim witted, oversexualized, and atavistic. The face of this image is a kind of caricature, but it is far more representational and detailed, more specific, more personal in a way, than the one eventually published. There is no accompanying correspondence between Penfield and Cantlie about the illustrations or the revisions, but I am more interested in how this figure speaks to us than in how it was authored. And both versions of this figure, as well as the nature of the revision, speak to us about fantasies of identification, about the imbrication of race, gender, class, and disability in the production of biomedical knowledge and normative subjects, not only in the spaces of pathology and embodied difference, but in the figuring of the neurological norm itself.



1937v1 Homunculus: Penfield Archives, Osler Library of the History of Medicine

Though the same general shape and layout as the combined somatosensory homunculus published in Penfield's 1937 article, this unpublished draft illustration is notably different. While still cartoonish, the musculature and shading are much more detailed and less abstract. Instead of cartoonish round eyes, it has more realistic eyes with elongated, droopy lids. Instead of the gap-toothed grin, it has large smirking lips, its nose is less upturned, it has a pronounced pinhead shape, with the top of the head being about a third the size of the bottom. The additional shading gives appearance of darker skin. The cumulative effect of these features is a racialized image that participates, wittingly or not, in racist visual vernaculars of Blackness.

While large lips, eyes, hands, feet, and genitals, and an elongated upper lip are essential features of the homunculus based on Penfield's brain mapping data, some features of the published version of the 1937

homunculus are immaterial to Penfield's project. His potbelly, for example, along with his gap-toothed smile, pug nose, and heavily hooded eyes. These features evoke racializing 19th century caricatures of Irish immigrants that appeared in satire cartoons. Participating in the same logics of evolution and racial superiority that underwrite the fantasies of racial identification of Blackness, these cartoons often compare the Irish to apes and represent them as well beyond the charmed circle of Anglo-Saxon whiteness, which is also coded as a classed distinction. The figure's misshapen and missing teeth evoke the related specters of class and hygiene (both oral and mental) and the sordid legacies of Malthusianism, criminology, and the like.

In other words, though the homunculus is a *normed* figure in the sense that he is the standardized outcome of aggregated data, he is far from *normative*. He participates in racialized visual vernaculars that are outside the white-coded space of normative masculinity. What's more, in evoking his imperfect whiteness in the form of his monstrousness, Blackness, and Irishness, I have also noted the way that the degradation of these categories entails their cognitive disablement through tropes of intelligence, which are tied simultaneously to race and class.

In this way, the homunculus unwittingly participates in what Mel Chen calls "cognition's racialization" (2014). Chen notes that those who embody race and class privilege can make "cognitive missteps" with "no serious penalties," while those who do not embody that privilege are: habitually produced as possible sites of deficiency, rather than as people who have historically struggled for access to a particular kind of cognitive elaboration tied to class and race privilege. [Chen] refers here to profiles of race, gender, and labor that produce variable 'body'-'mind' distributions that are keyed to their proper place in a hierarchy [Chen 2014, 176].

The hooded eyes, pinhead, and, later, gap-toothed grin of the homunculus suggest a dumbing down. The reading of these figures as dimwitted snaps into place so easily precisely because of cognition's racialization — because of the long histories that have rendered certain racialized others into figures who are all body and no thought. This dumbing down thus simultaneously brings the homunculus into the fold of disability in a way that further troubles the homunculus' whiteness. His whiteness comes to be marred by the evocation of racializing, inferiorized, and biologized cognitive capacities, and then further by the way this racialization of cognition justifies the racialization of physical labor. The universal little man in the brain, it turns out, is far from the gleaming white masculinity of other normative biomedical figures — from Vitruvian man suspended in an abstracted space of mathematical and intellectual perfection, to the countless standardized anatomical figures that grace text books, journal articles, and medical charts representing the supposedly universal subject.

Claiming Ancestors

If we follow the thread of cognition's racialization backward from the homunculus to other figures who were key to his conception, we encounter a long genealogy of troublesome subjects. There are those who found themselves — often after much personal effort — on Wilder Penfield's operating table, some of whom speak to us and appear to us in the surgical theatre transcripts and photographs that illustrate his work.

400

ORIGINAL ARTICLES AND CLINICAL CASES

- Repeated twice—failed twice, should be ignored.
Two negative stimulations.
B. Arm and hand "feels as though it was going to sleep."
Repeated once without warning.
C. Numbness left side above umbilicus. This location seems to be epigastric.
D. Sensation in right arm and hand; when repeated, said to be more in arm.
E. Sensation in hand and fingers; when asked what the sensation was like she replied: "like going to sleep." When asked if it was numbness or tingling, she replied "Both."
F. Sensation in ring and little finger.
G. Sensation in same fingers.

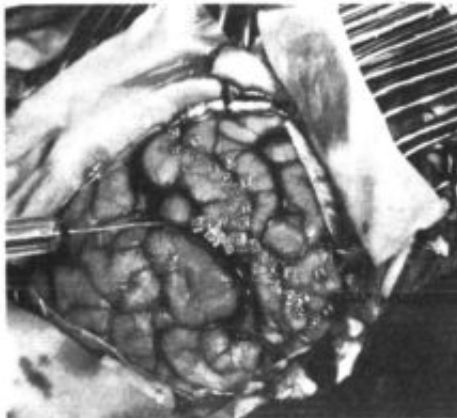


FIG. 4.—Cerebral cortex in Case 110 photographed during operation. The tickets of reference indicate responses which are described in text. See fig. 34 for diagram of same case.

Changed from Bipolar to Unipolar Electrode.

- 11 a.m. Left leg "going to sleep"—no stimulation.
H. Same feeling in index and large fingers.
I. Sensation in index finger—same feeling.
K. Sensation in thumb.
L. Sensation in thumb and toward index finger, but not in that finger.
M. Sensation left side of face—numbness.
N. Patient laughed a little; sensation in lower left lip.
O. Lower lip, left side.
P. Upper and lower teeth and gums.

Transcript: Penfield, Wilder, and Edwin Boldery (1937) "Somatic Motor and Sensory Representation in the Cerebral Cortex of Man as Studied by Electrical Stimulation." *Brain* 60: 389–443.

A page from Penfield's 1937 Brain article, co-authored with Edwin Boldery, in which the somatosensory homunculus first appeared. The page shows a list of responses of "M.G. a girl aged 21" to direct electrical stimulation of her brain, including observed movements (e.g. "Patient laughed a little") as well as her own utterances (e.g. "feels as though it

was going to sleep’). In the center of the page is a black and white reproduction of a photograph of her brain, taken during her operation in on June 9th, 1936. The visible portion of the brain is surrounded by surgical dressings and metal instruments. On the surface of her brain, small square paper tickets are visible, each with a number or letter identifying the location of each electrical stimulation.

One particularly important matriarch — described as such, more or less, by Penfield himself (1937) — is a woman named Mary Rafferty. Though her case appears with some frequency in bioethics texts, I was unaware of her until I began working on this project. When I encountered the moment of her contribution to the homunculus’ conception in a paper from 1874, a moment Penfield describes at some length his 1937 article, I found myself gripped by horror and on the verge of tears. Her story is not unlike many others in the annals of medicine, people who, by virtue of the social and political renderings of disability, race, religion, poverty, or provenance, became targets of authorized violence in the form of medical testing and experimentation (eg Cooper Owens 2017). I will not rehearse the entirety of what was done to Rafferty, both to spare you the encounter I had with the terrible details, as well as to avoid simply reproducing their violence. But I will offer those details that allow me to gesture in a different direction, one in which we might think about what happened to Mary Rafferty with greater care.

In 1874, Rafferty was a 30-year-old domestic servant, born in Ireland and living in Cincinnati, when she developed a two-inch ulcer in her skull, likely from florid epithelial cancer. She was treated at the Good Samaritan Hospital there for some months (either as inpatient or outpatient) until her case came to the notice Dr. Roberts Bartholow, a notable local physician and faculty member of the Medical College of Ohio (Harris and Almerigi 2009). Two citations of her case, one of which comes from Penfield himself (1950), state that she was working as a domestic in Bartholow’s own household, though the evidence for this is not clear. The only image of her is one haunting engraving depicting the back of her ulcerated head that illustrates the article Bartholow wrote about her. Part of my effort in the larger project is to give space to her life beyond the bounds of the medical case.



Mayo Domestics: Mayo, IR County Library Local Studies: Emigration: Family <http://www.mayolibrary.ie/en/LocalStudies/Emigration/Family/> Accessed August 5, 2019.

A black and white photograph of seven early 20th Century Irish emigrant domestic workers. Four women stand in the back row, and three sit in the front, all pale skinned with hair pulled back. Each wears a high collared dress and apron, and looks at the camera while holding the implements of her particular form of service: a broom and dustpan, a knife peeling an apple, a tray of drinks, a baby.

Following her initial consultation with him, Bartholow proceeded, over 6 separate sessions, to kill Mary Rafferty, or at the very least, hasten her death by probing her brain with electrodes. The toll that the sessions take on her is acute, cumulative, and painfully obvious. At one of the stimulations during the third session, Bartholow writes “Her countenance exhibited great distress and she began to cry.” The sessions continue, and three terrifying days later Mary Rafferty is dead. When Wilder Penfield writes about the case he is clearly disturbed by it. But he also recognized this as the first use of direct electrical stimulation on the conscious human brain, and, thereby, as an important moment in the history of which he considered himself and the homunculus to be a part.[\[1\]](#)

In his 1874 paper describing her case, Bartholow wrote that Mary Rafferty was “rather feeble-minded,” a category tied to a whole range of cognitive conditions with an intimate relation to institutionalization and eugenics, and which is often seamlessly translated into the contemporary category of cognitive or intellectual disability. As the case has been taken up in bioethics, it has become an object lesson in questions of research consent and cognitive capacity.

But the historiography of ‘feeble mindedness’—particularly critical work in disability studies (eg Clare 2014; Cohen 2017)—shows that the construction of feeble mindedness as a category of degeneracy is inseparable from other such categories—particularly those of race and class, suggesting that rather than a seamless translation of ‘feeble minded’ into ‘cognitive disability’ what is required is a reading of the coordination of cognition with, as Mel Chen puts it, “profiles of race, gender, and labor that produce variable ‘body’–‘mind’ distributions that are keyed to their proper place in a hierarchy.”

In 1874, Bartholow wrote that, despite her “rather feeble” mind, Rafferty “is cheerful in manner and smiles freely and easily” (Bartholow 1874, 308, 309). This is surprising, to say the least, given the advanced state of her disease for which she had been seeking care for as many as 13 months by the time she was seen by Bartholow. “Pain is experienced” he reports “but it is not very acute.”

Rafferty’s ‘cheerful’ disposition upon presenting herself in such a state to a man who may have been her employer, and at the very least was a notable figure of medical authority, a wealthy and powerful white man described by others as having a “chilly reserve,” and “uninviting manner” (Juettner cited in Harris and Almerigi 2009, 93), must certainly say more about the affective discipline of domestic service and the gendering performances of 19th century medicine than her level of pain or state of health. Mary Rafferty’s affectively disciplined performance of patienthood is intertwined with her position as a classed and racialized subject—as an Irish immigrant domestic worker.

While the hole in her skull was in all likelihood caused by her cancer, Rafferty herself is said to have attributed it to the chafing of a piece of whalebone in the wig that she wore to cover a scarred patch of her scalp where no hair grew. This was the result of having fallen into the fire as an infant, likely in the home she shared with her mother, at least some of her four siblings, and perhaps her father (Bartholow 1874). This life-threatening accident gestures at the precarity of Irish working-class domestic life in the time of the Great Potato Famine when Rafferty was born, a precarity she was presumably attempting to navigate both by wearing a painful prosthetic and by becoming a domestic worker in America.



Wig: Harper's Bizarre (1867), November 2:5.

A black and white illustration of 10 elaborately styled women's hairpieces. They appeared in the New York Fashions section of the inaugural issue of Harper's Bizarre, published on November 2nd, 1867.

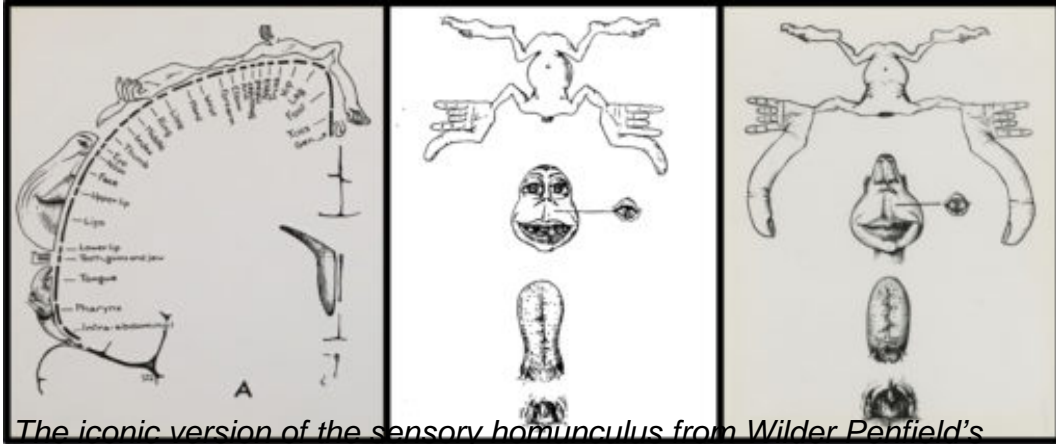
Thinking of the racialization of cognition, we might ask why Rafferty's apparent feble-mindedness — the indications of which are not stated — is not read as symptom of her brain tumor, and how that designation fits with the fact that, as Bartholow writes, "Mary returned correct replies to all questions [...that] she does not hesitate for words" (Bartholow 1874). One answer to these questions is that feeble-mindedness is a designation ready at hand to describe the cognitive mode of an Irish working-class immigrant woman.

I point this out not to suggest that her cognitive capacities have been mis-diagnosed (though perhaps they have), but rather to point to the way that the designation of her mind as "rather feeble" is hardly straightforward, and that this clinical interpolation cannot be read outside the normative expectations of affect, intelligence, and communicative capacity to which Mary Rafferty was subject.

In describing her case in his own 1937 article, in claiming her as an ancestor to the homunculus, Penfield wrote that Rafferty had been "*made to wear*" her wig (Penfield and Bowldery 1937, 394). This imperative characterization seems especially important given that Rafferty's use of the prosthetic must have facilitated her basic social and economic livelihood as a racialized working-class immigrant woman in the late 19th Century urban United States, an era that gave rise to the US's Ugly Laws (Schweik 2009) and that is notorious for its deeply disciplinary cultivation

of women's bodies. I am further struck by the violence of this imperative when I consider that this prosthetic which Rafferty was "made to wear" caused her such discomfort she suspected it had quite literally worn away her skull.

homunculus Revolts



*The iconic version of the sensory homunculus from Wilder Penfield's 1950 book, *The Cerebral Cortex of Man*, alongside the somatosensory figure from his 1937 *Brain* article on cortical localization and the unpublished first draft of that figure.*

In writing of cognition's racialization, Mel Chen invites us to ask the question "Who gets to begin, in the eyes of others, with a body? And who gets to begin, in the eyes of others, with a mind?" The homunculus speaks to us of the ways that this question—a question of about the inscription of social difference—lingers in the charting of the cortical anatomy. In his imperfect whiteness, his imperfect masculinity, his all-body-and-no-thought-ness, he could hardly be further from the anatomical ideal, from the normative masculinity of the body of biomedicine that we are used to critiquing. Thinking of his ancestors— not only Mary Rafferty but the 163 others whose disabilities were essential to his conception, whose seizures and scars and symptoms and articulate bodies and words were the literal stuff of Penfield's inscriptions, as he lay little numbered paper tickets directly on their brains to indicate the location of each electrical stimulation while his stenographer recorded their responses—their descriptions of auras, of tingling, of sudden memories, of the feeling of falling asleep—thinking of all of these ancestors, all of whom were definitionally pathologized and whose pathologies, whose disabilities, became the stuff of a normative and universal rendering of cortical localization, it is tempting to say that the homunculus crips the very concept of a normative anatomical body, one iteration of which he is supposed to be.

This, I think, is his potential. To open new possibilities for thinking simultaneously about gender, race, class, and disability in the context of neuroscientific knowledge, new ways of thinking about the fantasies of identification in which neuroscience participates. And here is the other, second, meaning I intend when I say “homunculus revolts;” that if we think about the specific reasons this figure is read as *grotesque*, *monstrous*, *hideous*, a parade of stigmatizing adjectives also regularly and historically used against people with disabilities in a practice of stigmatization that is always also colored by the degradation of non-whiteness; if we marry the historical story of his birth with a cultural reading of his significance, we may find something of a revolution, a radical turn that might generate new lines of critique that understand something other than normativity as central to the making of the neurological subject.

Notes

[1] Bartholow’s treatment of Mary Rafferty, along with Dr. Seeley (described as the House Physician), achieved infamy even in his own day. He was sanctioned by the American Medical Association shortly after publishing her case, and Bartholow himself is supposed to have claimed that should anyone attempt to repeat the experiment now that the fatal outcome was known, they should be considered criminal (Harris and Almerigi 2009).

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