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In recent years some scholars have argued that the gut microbiome, perhaps as much as the brain, defines the condition of humanness (Moore, Mathias, & Valeur 1). Communication between the gastrointestinal tract and the central nervous system is referred to as the gut-brain axis. Gut flora sometimes figure in how scientists in the twenty-first century conceive of this biochemical connection.

Microbes occupy a tense position in the culture of the Anthropocene, as simultaneously “the foremost enemy of humans” and “part of our very being” (Sariola and Gilbert 2). Increasing numbers of scholars view humans and other multicellular organisms as “holobionts”—a kind of biotic “consortium” comprising “the host plus all its symbiotic microbes” (Sariola and Gilbert 4). In

fact, Sariola and Gilbert explain that approaches to public health informed by this understanding acknowledge the ambivalent potentials of microbes as life-sustaining or destructive, and such approaches emphasize (with equally ambivalent implications) that microbial deficiencies can give rise to an assortment of illnesses, including cognitive, psychiatric, and neurological conditions (Sariola and Gilbert 5).

But the gut-brain axis, like the body generally, has a history, and that history is tied in part to nineteenth-century histories of disease. In the nineteenth-century United States, therapeutic regimes were not merely responses to the characteristic signs and symptoms of a particular disease; they also played a part in how diseases were defined. For instance, the intimate therapeutics of the 1832 cholera outbreak in the United States catalyzed a general professional interest among American physicians in the morbid changes of the gastrointestinal tract. Physicians' observations of diseased bodies incited revisions and additions to standing anatomical theories, including Marie-François-Xavier Bichat's theorization of vitalism.

As philosopher of science Osamu Kanamori explained, "vitalism is a kind of general idea that supports the notion that something exists in the living creature which cannot be understood by means of physicochemical analysis" (Kanamori 13). Physicians drew upon Bichat's vitalism to postulate harmonious linkages between the digestive system and the cerebrospinal and ganglionic nervous systems. As early as the 1750s, some anatomists theorized what medical humanities scholar Sebastien Normandin has explained as "a sensible construction made up of skin and nerves that was connected in a vitalistic triumvirate with the brain and epigastric region" (Normandin 13).

Hugh Hodge of Philadelphia adhered to the theories of Bichat, explaining that all of the body's life-sustaining workings depended, at least to some extent, on the ganglionic system. Hodge clarified that, "while the brain and its dependencies" were subject to morbid sensations unique to them, "every part of the body, not excepting the brain and nerves," was susceptible to ganglionic disorders (Hodge 6).

Samuel Jackson, another Philadelphia physician, elaborated on Bichat's vitalism. Inspired by cholera, Jackson wrote of the "intimate and important" connections between the alimentary canal and the ganglionic nervous system, evidenced by "the large amount of nervous tissue belonging to the ganglionic apparatus appropriated to the organs of the digestive functions." The influence of the alimentary organs flowed to "numerous organs" through the spinal ganglia (Jackson 342). Here it is important to note that nineteenth-century medical researchers emphasized nerve endings rather than gut microbes. In gendered ways, mistreatment of the stomach's nerves could produce disastrously disordered emotions—hot-temperedness in men, and fearfulness in women (Miller 3).

If physicians in the early nineteenth century, like Samuel Jackson and Hugh Hodge, understood the brain and gut as closely connected, by the 1890s some anatomists questioned the nature of the relationship between the nervous and digestive systems. In the 1892 edition of their *Hand-book of*

Physiology, William Marrant Baker and his co-authors Vincent Dormer Harris and William Senhouse Kirkes proposed instead that “[t]he normal movements of the stomach during gastric digestion do not appear to be so closely connected with the plexuses of nerves and ganglia contained in its walls as was formerly supposed” (Baker, Harris, and Kirkes 349). This view reflected an adjustment in thinking about the connections between brain and gut, rather than a wholesale dismissal of the existence of such a relationship. The central nervous system—in the words of Baker, Harris, and Kirkes—“regulate[d]” digestive contractions in the stomach “by impulses passing down by the vagi or splanchnic nerves” (Baker, Harris, and Kirkes 350).

Even so, by the late nineteenth century neurasthenia (or “nervous exhaustion”) had become intimately linked in the medical imagination with the gut. The nature of this relationship was a contested one, however. Did gastric issues give rise to general neurasthenia, or vice versa? Most physicians seem to have privileged general neurasthenia as productive of gastric complaints, though some believed that the causality was reversed (Lillestøl 5).

In the twenty-first century, ideologies of biohacking, like the vitalism and neurasthenia of earlier centuries, theorize an intimate link between the bowels and the brain. Scholar of embodiment Hil Malatino defines biohacking as an ethically fraught endeavor aimed at “manipulating biology through engaging biomolecular, medical, and technological innovations” (Malatino 179). Experiments involving psychobiotics—microbes ingested in order to improve psychiatric health—have worked to expose a “physicalized nature of the mind” (Bruce and Ritchie 369). This complex intertwining of body and mind is suggestive of disability studies scholar Margaret Price’s theorization of the “bodymind” as descriptive of the overlappings between mind and body that render the two inextricable from each other (See Price). But developments in the fields of biohacking and psychobiotics should also serve as reminders that the embodied mind is more than an innovative theory resulting from cutting-edge biochemical tinkering. Rather, the embodied mind has a history—a history lately written in the ambivalent language of microbes, but also in the nervous language of ganglia and the dynamic language of vitalistic energies.

Cover Image: Diagram of the nerves of the digestive system. From William Marrant Baker, Vincent Dormer Harris, and William Senhouse Kirkes, *Hand-book of Physiology*, 13th ed., London: John Murray, 1892, p. 349.

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