Back to Article page

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Gutted

Steven Shapin

A Modern History of the Stomach: Gastric Illness, Medicine and British Society, 1800-1950 by Ian Miller
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Alexis St Martin was one of the 19th century's most important scientific guinea pigs. In 1822, the illiterate young French-Canadian was working as a 'voyageur' for John Jacob Astor's fur-trading company in northern Michigan. He was hanging out with a bunch of rowdies in the company store when a shotgun accidentally went off and he was hit below his left nipple. The injury was serious and likely to be fatal – his half-digested breakfast was pouring out of the wound from his perforated stomach, along with bits of the stomach itself – but a US army surgeon called William Beaumont was nevertheless sent for. Beaumont was pessimistic, but he cleaned the wound as best he could and was amazed the next day to find his patient still alive. It was touch and go for almost a year: St Martin survived, though with a gastric fistula about two and a half inches in circumference. It was now possible for Beaumont to peer into St Martin's stomach, to insert his forefinger into it, to introduce muslin bags containing bits of food and to retrieve them whenever he wanted. Human digestion had become visible.

Beaumont took over St Martin's care when charity support ran out, and over the next ten years the patient lived intermittently with the doctor, as both his domestic servant and a contractually paid experimental object. St Martin's fistula was soon to become one of the modern world's most celebrated peepshows. The experiments were conducted at intervals over the eight years from 1825 and a remarkable contract survives which established a legal basis for scientific access to St Martin's stomach:

> Alexis will at all times ... submit to assist and promote by all means in his power such philosophical or medical experiments as the said William shall direct or cause to be made on or in the stomach of him, the said Alexis, either through and by means of the aperture or opening thereto in the side of him, the said Alexis, or otherwise, and will obey, suffer and comply with all

> reasonable and proper orders of or experiments of the said William in relation thereto, and in relation to the exhibiting and showing of his said stomach and the powers and properties thereof and of the appurtenances, and powers, properties, situation and state of the contents thereof.

In return for letting Beaumont in and out of his stomach, St Martin was to get board, lodging and about $150 a year. But by 1833 he'd had enough: he went back to his old life as a voyageur, and, amazingly, lived well into his seventies. At his death he was survived by a wife and six children, who had him buried two feet deeper than usual so that the scientists could not retrieve the corpse and dissect his stomach.

St Martin's fistula offered a unique form of scientific access to the living stomach, but throughout the 19th century ever more powerful technologies were being devised to get at its contents and to render it visible, audible and, finally, manipulable. Physicians became more skilled in such non-invasive techniques as auscultation, learning to distinguish and to mark the physiological significance of stomach sounds called, variously, 'splashing', 'gurgling', 'ringing' and 'sizzling'. In 1868, the Freiburg physician Adolf Kussmaul invented a rigid tube, developed through experimentation with a sword-swallower, that enabled him to retrieve samples from the oesophagus and stomach and even to see a little of what was going on in there. In the 1890s, a New York doctor called Max Einhorn devised a small silver 'stomach bucket', secured to a string. Patients, suitably encouraged, swallowed the thing, and Einhorn would then pull up the bucket and have its gastric contents chemically analysed. From about the 1930s, endoscopy became a key diagnostic tool, and now upper-gastrointestinal endoscopy extends medical vision as far as the duodenum, the bit of the small intestine just downstream of the stomach. By the 1910s, X-ray technology was making a vital contribution to visualising the stomach and its lesions. Surgical access to the organs of the abdomen in the 19th century was slow in developing, partly because of problems with anaesthesia and infection, and partly because surgeons initially had little basis for understanding the significance of what they were seeing, but after the 'Listerian revolution' in antisepsis surgeons became increasingly comfortable with a range of abdominal operations, especially in connection with peptic ulcers.

Beaumont's work with his experimental subject was aimed at understanding digestion in general, not St Martin's digestion in particular. He wanted to know how digestion normally went on, and was not much interested in how it occasionally went wrong. He tabulated how long various types of food took to be digested; he recorded the temperature of the stomach under different dietary and climatic conditions; he compared digestion in St Martin's stomach with the action of extracted gastric juice and food *in vitro*; he measured the dynamics of secretion of the juice; he analysed the juice and shipped samples to university chemistry laboratories at Virginia, Yale and Stockholm, which confirmed his

judgment that its main active constituent was hydrochloric acid and that digestion was just a process of chemical decomposition, replicable in a test tube. St Martin's guts were becoming universalised.

St Martin's stomach also offered evidence about minor pathologies, their possible causes and likely treatments. So when St Martin had a fit of 'violent anger', Beaumont observed an almost unprecedented appearance of yellow bile in the gastric juice, showing, he said, 'the effect of violent passion on the digestive apparatus'. He watched St Martin's stomach carefully when he ate particularly large meals, noted the peculiar appearance of the chyme (or partly digested food mass) in his stomach, and drew conclusions about the physiological consequences of excess. When St Martin drank 'ardent spirits', and when he ate 'stimulating condiments' like mustard and vinegar, the doctor saw a morbid appearance of the stomach lining which interfered with digestion and which was 'prejudicial to the healthy stomach'. An excited mental state, dietary excess and the use of stimulants – all of these had their effects on the volume and acidity of the gastric juice and, through the juice, were punished by indigestion, or, as doctors preferred to call it, dyspepsia. These were the categories – variously stressed and combined – used to understand and manage indigestion well into the 20th century. Excess acid was conceded to be the proximal cause of disease, with distal causes including diet and practically any aspect of human conduct you could think of. And these were the connections that gave the stomach its moral significance.

At the time of Beaumont's experiments, at most several hundred physicians and physiologists were conducting research on digestion, but all the world was interested in indigestion. Dyspepsia was recognised as one of the great afflictions of the 19th century and medical stories about its causes were both unstable and resonant. Ian Miller's book begins at a point of rapid change in the scientific understanding of how the stomach functioned in health and disease and breaks off – unfortunately – short of the more recent changes brought about by the surprising discovery in the early 1980s of pathogenic bacteria in the stomach and by the development of a new range of acid-controlling drugs. It's a story about changing notions of the stomach's role in overall human bodily function, of the nature of its diseases in relation to other aspects of the human body and mind, of treatments brought to bear on those diseases, and, above all, of contests for the right authoritatively to pronounce on stomach function and dysfunction. *A Modern History of the Stomach* isn't a delight to read – after the 19th time I was told that different aspects of the stomach had been 'prioritised', I was feeling symptoms of gastric distress – but the big ideas that frame the book are good and one hopes Miller hasn't scared off writers who might tell the story more clearly and confidently. A history of the stomach really does work as a site for understanding how we've come to think about minds, bodies and modernity.

In the 19th century, a lot of people cared a lot about dyspepsia because there were a lot of

dyspeptics about. Their sufferings were serious, making the worst cases 'as wretched as human nature can bear and live'. The stomach troubles of some of the century's great thinkers verged on common knowledge. Thomas Carlyle was advertised as a 'martyr' to dyspepsia – there was, he confided, only a small part of his life in which he 'was not conscious of the ownership of that diabolical arrangement called a stomach' – and Charles Darwin's friends understood that his uncontrollable retching and farting seriously limited his public life. Historical tradition had tended to associate indigestion and related ailments with certain sorts of people, but new democratic elements were being introduced to 19th-century Anglophone culture. Physicians now began to insist that the 'demon dyspepsia' was no respecter of rank or profession: 'It knocks at the door of every gradation of society.' The rich man in his castle, the poor man at his gate – the disordered stomach laid them all low.

Miller writes about the British stomach and makes a case for indigestion in the 19th century as 'the national disease of Britain', in a lineage that earlier included 'biliousness' and, especially, 'the English malady' – 'melancholy', 'hypochondriasis', 'lowness of spirits' – or what tends now to be called 'depression' or 'anxiety'. He's not wrong about that, even if dyspepsia was also frequently talked about as a defining American malady by British critics who reckoned that the whole country was suffering uniquely from epidemic indigestion. One of those critics was the great English catering entrepreneur Joseph Lyons. Visiting New York in 1907, Lyons told his hosts that they were a 'nation of dyspeptics' and, in an excess of gastronomic chutzpah, that the cause was the appalling American diet. Locating the national chronic malady in the stomach may, however, be an Anglo-Saxon trait. The national complaint of the Germans is *Herzinsuffizienz* and the French have the *crise de foie*, both conditions not easily translatable into Anglophone disease categories, though French medical writers often acknowledged a causal link between the states of the liver and stomach.

The democratisation of indigestion tracked changing understandings of its causes. Dyspepsia had been, and long continued to be, classified by the doctors as an 'atonic neurosis' – a lack of tone or elasticity in the nerves, causing a debilitation (or 'imbecility') of the stomach – so the causes might be sought in anything bearing on the state of the nervous system. Writing in 1840, an English physician had it as a matter of course that 'a most intimate sympathy exists between the Stomach and the Brain'. The stomach was a juice-filled bag, and, as Beaumont knew, the volume and composition of juices might be affected by mental states, but it was also a churn – and when its churning power was weakened, digestion suffered.

In the past, a weak stomach and poor digestion was recognised as one of the diseases of philosophers, scholars and the learned. There was a finite quantity of vital spirits in the body: if they were called on to power digestion, they would not be available for the

demands of deep thinking, and, conversely, philosophising interfered with the stomach's duties. In the late 15th century, Ficino wrote that 'it is bad to strain the stomach with food and drink, and worst of all, with the stomach so strained, to think difficult thoughts,' and early in the 18th century the author of a treatise on occupational diseases noted that 'all the men of learning used to complain of a weakness in the stomach.' It is this medical sensibility that lay behind the etiquette of 'table talk' – light, airy and undemanding stuff that didn't draw the vital spirits away from the stomach's proper work. It was a courtesy medicine paid to manners.

Belief in a causal loop between the stomach and the mind never disappeared. In 1838 Darwin announced that 'I find the noodle & the stomach are antagonistic powers ... What thought has to do with digesting roast beef, – I cannot say, but they are brother faculties.' And in the 1880s, Nietzsche diagnosed the whole Western philosophical tradition as a case of indigestion. Thus spake Zarathustra: 'Because [the philosophers] learned badly and not the best, and everything too early and everything too fast; because they *ate* badly: from thence hath resulted their ruined stomach.' Whereupon Nietzsche took himself off to Turin to purge his philosophical-digestive system: 'No more greasy, stodgy, beer-washed idealistic Christian German food for me! I shall curl up with gut pain, vomit if you don't give me Italian vegetables.' Just a few years later, a London physician called John Clarke closed the circle by suggesting that indigestion and evolution were causally connected: if Darwin's stomach had been healthier, 'his view of humanity might possibly have been a more generous and exalted one.' Clarke had no doubt that the writings of 'some pessimistic philosophers, which modern would-be thinkers waste their energies in trying to understand, are the pure products of disordered digestion'.

In *The Anatomy of Melancholy* (1621), Robert Burton wrote that the stomach is the 'king of the belly, because if he be distempered, all the rest suffer with him.' Early 19th-century physicians agreed: 'It is a great mistake to regard dyspepsia as peculiarly or especially a disease of the stomach.' Through the nervous connections between the stomach and the rest of the body, and through the stomach's role in transforming sustenance into self, anything that went wrong in the guts could wind up disordering not just the mind but the liver, heart, gall bladder, spleen, pancreas, lungs and skin. In addition to complaints located in the stomach, the dyspeptic might suffer constipation, diarrhoea, headache, insomnia, jaundice, pallor, gout, bladder stones and mouth sores. 'Sins against the stomach,' an English physician wrote in the 1820s, 'are sins against the whole frame.'

Dyspepsia – its supposed causes and attempted treatments – ramified everywhere in the culture too. Its democratisation was folded into an emerging social critique. The problem with indigestion was now said to reside in collective and not just individual patterns of life. The pace and the tension of the modern city, its unclean atmosphere, the lack of opportunities for exercise, too much sitting around and not enough brisk walking, were all

responsible for weakening the stomach. Businessmen's rush-rush style rendered them particularly vulnerable, but all city-dwellers were at risk. Everyone was now living on their nerves and paying the price. The old English political faultline between court and country was now reconfigured in the demography of dyspepsia. Indigestion took its place as one of the supposed diseases of civilisation, and, in turn, you could take the prevalence of stomach complaints as a marker of pathological modernity.

If indigestion was brought about by modern life, so its management and cure constituted a restored regime of virtue, or, if you preferred a religious idiom, a life in accord with God's natural laws. ('Gluttony punishes the glutton,' Victor Hugo wrote in *Les Misérables*: 'Indigestion is charged by God with enforcing morality on the stomach.') Relax, take a walk in the country, eat moderately and slowly, avoid intoxicating drinks and stimulants, get what's now called the work-life balance right. (There were indeed pills hawked about for the cure of indigestion, but for much of the century elite physicians tended to look down their noses at the very idea of magic bullets: they were signs of the quack.)

Over the 150 years of Miller's story, a great deal changed, and, less visibly, remained the same, in the way doctors and the laity understood stomach complaints. Driven by various brands of medical expertise, dyspepsia began to split into a range of more or less discrete conditions. It started out as one thing with many forms, and it became many things, each with its own diagnostic practices, causes and cures. Much of this followed on from the work of Beaumont and others in the 1820s and 1830s: new techniques appeared for securing knowledge of the stomach and its doings. Different techniques tended to belong to different kinds of medical practitioner. Who had the right to interpret human innards?

Among the increasingly prominent specific ailments, peptic ulcers took pride of place. Only a fraction of patients suffering from gastric distress actually had ulcers (or, worse, cancer), and physicians knew that, but a number of new medical developments propelled ulcer diagnoses into significance at the end of the 19th and beginning of the 20th century. At first – Beaumont's good luck excepted – there was no effective way to visualise the living stomach. Post-mortem dissection made a contribution, but surgeons led the way. In the first years of the 20th century, the great English abdominal surgeon Berkeley Moynihan asserted the surgeon's right to define and to cure the diseases of the stomach. The pathologist could only visualise dead guts, while the surgeon could see, feel and manipulate the living organ. Surgery, he said, was 'the pathology of the living'. Moynihan insisted that the ailments of the stomach were caused, importantly if not wholly, by organic lesions – in the case of ulcers, a lesion in the gastric mucosa which surgeons could excise, stitch up or cauterise. The surgeon's direct approach also threw up a surprise: the majority of peptic ulcers were not in the stomach lining at all but in the duodenum, and Moynihan could correlate the different organic lesions with different symptoms. It was the organic lesion that increasingly attracted medical interest, pushing the category known as

'functional dyspepsia' – that is, the presentation of gastric symptoms without an evident organic basis – into the background and into the domain of self-management. This sort of thing could be dealt with by antacids and by changes in diet and behaviour, but it was of less and less interest to physicians.

Doctors could still, of course, be interested in how ulcers were caused, and the causative role of excess stomach acid was widely conceded – in 1910, the Croatian physician Karl Schwarz formulated the dictum 'No acid, no ulcer' – but as long as surgery was as effective as advertised, it might not matter very much how excess acid was induced, whether, for example, by eating intemperately or in a rush, or by eating the wrong things, or through stress and anxiety. And so the surgeon's stomach was a secular organ, detached from the moral patterns of everyday life. It might, after all, be a good idea to relax, to take a walk in the country, to be temperate, to chew your food properly, and to go easy on the claret and the spicy dishes, but your ulcers might nevertheless be cured by the surgeon's direct intervention.

The surgeons were optimistic about their curative powers, but, by the mid-1920s, evidence was accumulating that their case had been oversold. Surgical patients were tending to relapse over time, stomach acidity was not being reduced and surgical risks and complications could no longer be ignored. In the event, the notion that medical treatment and diet worked better than surgery had its advocates even in the first decades of the 20th century. And by the 1930s both medical treatment and 'psychosomatic' accounts of ulcer causation were challenging the surgeon's primacy.

In the early 1900s, the Harvard physiologist Walter Cannon argued for an important causative role of the emotions on the secretion of stomach acid: 'Just as feelings of comfort and peace of mind are fundamental to normal digestion, so discomfort and mental discord may be fundamental to disturbed digestion.' Cannon's view of psychic involvement in gastric disease was broadly supported by the experimental work of physiologists in the 1930s and 1940s. In Britain, clinical research on peptic ulcer patients found that episodes of high anxiety often preceded medical presentation. Emotional states were said to be causal but they were not the sort of thing you could cut out or stitch up: they had to be addressed behaviourally. From the 1930s, psychiatrists, psychologists and social scientists were identifying what they called the 'ulcer type' – tense, hard-driving, the man in the grey flannel suit, unable to let go, to stop and smell the roses. In the early years of the Second World War, British military physicians observed high levels of peptic ulcers among the troops and especially among the evacuees from Dunkirk. While dreadful army food and high levels of tobacco use were implicated, 'military dyspepsia' and 'war ulcers' were also linked to psychological stress. It was an association that became more durable during the Blitz, when psychiatrists diagnosed anxiety as a cause of 'air-raid ulcers' in the civilian population.

The history of the stomach, as Miller shows, does not simply rise towards reductionism. The stomach's management and feeding is too implicated in frames of personal identity and moral value to be encompassed by chemical and structural accounts. Throughout the 19th and 20th centuries there were many attempts to secularise the stomach – to disconnect the understanding of its pathologies and the prescription of its care from mental and moral life – but they never wholly succeeded. Apart from a few concluding gestures, the last half-century of stomach history isn't part of Miller's story, and that is too bad because the Nobel Prize-winning discovery in 1982 of the bacterium *Helicobacter pylori* and its causative role in peptic ulcers turned the stomach world upside down.

It had long been assumed that the stomach was an antiseptic environment – how could bacteria possibly live in car-battery-strength hydrochloric acid? The finding of microbial causes of a range of illnesses had been counted among the triumphs of scientific medicine, yet ulcers seemed clearly different. Now, however, another major human affliction had finally been assigned its bacterial cause and, with antibiotics at hand, its cure was assured. But it hasn't worked out exactly like that: the majority of people infected with *H. pylori* do not experience clinical symptoms and peptic ulcers may have other important causes, including aspirin and ibuprofen use. Ulcers can be treated with antibiotics that kill the bacteria, but acid-reducing prescription drugs developed from the 1970s ('proton-pump inhibitors' and 'H2 blockers') are widely used in conjunction with antibiotics, and patients are often counselled to eat and behave in ways that can reduce the production of stomach acid. Some experts now declare that there is no such thing as an 'ulcer personality' and that worry and anxiety have nothing to do with ulcers. But some remain to be convinced, saying that 'other factors' are implicated in explaining why people infected by *H. pylori* do not fall victim, or why gastric symptoms flare up, and these 'other factors' include 'lifestyle habits, like coffee drinking, smoking and ongoing stress'. 'Stress,' the American gastroenterologist Howard Spiro writes, 'increases vulnerability' to other ulcer-causing agents 'like *H. pylori*'. Medical fascination with bacterial causation has, he says, resulted in culpable neglect of the roles of the mind, the emotions and the dietary and behavioural patterns of everyday life.

The modern stomach contains undigested pieces of its own history. It's like this: an American male in his sixties goes to his doctor. He knows some of the language, so he says he's suffering from 'acid reflux', not from 'indigestion', 'heartburn' or a 'sour stomach'. The doctor asks a few questions about when and how often the symptoms occur and how they respond to over-the-counter remedies, and she refers him to a gastroenterologist. The specialist asks similar questions and then schedules an endoscopy to 'have a look' and 'rule out the bad stuff'. Administered one of those 'twilight' sedatives, the patient and his gastroenterologist view the problematic oesophagus and stomach together in real time, displayed on a high-def monitor: they're pink and surprisingly nice-looking, the patient

recalls thinking. Meeting later to review the findings, the gastroenterologist does rule out 'the bad stuff' (cancer and ulcers), tells the patient he's got 'gastroesophageal reflux disease' (GERD in the US; GORD in the UK), which is 'our fancy name for heartburn'. He asks whether the patient's job is 'stressful', whether there are 'any other sources of anxiety' in his life, and how much he drinks, to which the patient replies 'yes', 'yes' and 'not enough'. The patient leaves with a prescription for the blockbuster proton-pump inhibitor omeprazole, which he's directed to take daily, and which is meant to block the stomach's acid production. 'Try to cut down on wine,' the specialist says and 'for occasional episodes, take an antacid.' The patient gets ready to leave, but the gastroenterologist has one more thought: he asks whether the patient has ever tried yoga or meditation and suggests it might be worth a go.

Vol. 33 No. 13 · 30 June 2011 » Steven Shapin » Gutted (print version)
pages 15-17 | 4212 words

ISSN 0260-9592 ^ Top