NOTES & RECORDS OF THE ROYAL SOCIETY

Radicals, romantics and electrical showmen: placing galvanism at the end of the english enlightenment

Iwan Rhys Morus

Notes Rec. R. Soc. 2009 **63**, 263-275 first published online July 1, 2009
doi: 10.1098/rsnr.2009.0023

NOTES & RECORDS OF THE ROYAL SOCIETY

Notes Rec. R. Soc. (2009) **63**, 263–275
doi:10.1098/rsnr.2009.0023
Published online 1 July 2009

RADICALS, ROMANTICS AND ELECTRICAL SHOWMEN: PLACING GALVANISM AT THE END OF THE ENGLISH ENLIGHTENMENT

by

IWAN RHYS MORUS*

Department of History & Welsh History, Hugh Owen Building, Aberystwyth University, Penglais, Aberystwyth SY23 3DY, UK

This paper examines the shifting cultural place of galvanic experiments at the beginning of the nineteenth century. It surveys the ways in which political readings of galvanism by radicals and Tories during this period had an important role in determining the ways in which these kinds of experiment, and galvanism in general, were understood later in the century. The paper examines the attitudes of Humphry Davy, Thomas Beddoes and Giovanni Aldini to galvanism and suggests that there was a good deal of contemporary interpretative flexibility about the ways in which galvanic experimentation might be understood. It argues in particular that Humphry Davy's rejection of his earlier views on galvanism after his arrival at the Royal Institution can be regarded as emblematic of a broader shift in the culture of experimental natural philosophy at the end of the English Enlightenment.

Keywords: Aldini; Beddoes; Davy; enlightenment; galvanism; radicalism

In his *Satirical View of London* the author John Corry cast a beady eye over the metropolis's intellectual culture. The city was, he said, the 'attractive centre of science, intelligence, and opulence' and 'the emporium of commerce, knowledge, and elegance.'[1] Two natural philosophers in particular bore the brunt of Corry's heavy-handed wit as he turned his attention to the pretensions of contemporary science. One of them, a 'late physician', had 'made a gigantic stride towards immortality. His oxygen gas, if taken in sufficient quantity, will counteract the decays of nature; and as there is little doubt that a man will live as long as he can breathe this pure ether, this wonderful discovery bids fair to restore the longevity of the antediluvians.' Even this scientific miracle was put in the shade by the effects of galvanism, however. Through its agency the 'most wonderful *distortions*' could be produced, and 'in an experiment made on malefactor who was executed at Newgate, he immediately opened his mouth:—doubtless, another application would have made him speak; but the operators, Aldini, Wilkinson, and Co. were so much affrighted that they threw down their instruments and took to their heels.' In case there was any room for misunderstanding, a footnote identified the late physician in question as Thomas Beddoes.[2]

*irm@aber.ac.uk

Corry's attack is interesting for two reasons. The first reason is the way in which he culturally brackets both pneumatic chemistry and galvanism. The second reason is because of who Corry was—or rather of who he was not. The discussion of Beddoes's and Aldini's supposedly fantastical practices took place under the heading of 'quack doctors'. Corry's view was that the two natural philosophers were not merely charlatans but self-deluded charlatans. They believed their own nonsense. This meant that they were fit subjects for ridicule as much as for censure. From the satirist's point of view, at least, it appears that pneumatic chemistry and galvanism belonged together. They belonged together because both were simultaneously the products of self-delusion and of sharp practice. These kinds of attack on experimental natural philosophy usually emanated from Tory ideologues associating their target with revolutionary excess. Corry is interesting because he appears to have been no such thing. Little is known of him except that he was active as a writer in Dublin before moving to London in the 1790s. He published prolifically, including a number of biographies and works aimed at children. There appear to be no indications of Tory leanings. Significantly, he wrote a laudatory biography of Joseph Priestley, which also contained several barbed remarks aimed at Thomas Beddoes and his pneumatic chemistry.[3]

Joseph Priestley might in many respects be taken as the epitome of the radical natural philosopher and certainly not a likely subject for biography by Tory hacks. His famous challenge is often taken to define the place of electricity—and particularly its political place—in the English Enlightenment: 'the English hierarchy (if there be anything unsound in its constitution) has equal reason to tremble, even at an air-pump or an electrical machine.'[4] What Priestley meant was that by exposing the real economy of nature's laws, electrical experiments and instruments also exposed the iniquities of a corrupt state. The English Enlightenment itself is difficult to pin down, and the Enlightenment more generally has come to appear increasingly unpromising as a description of a coherent historical movement. It is certainly unlikely that many (if any) contemporaries would have recognized any such unifying category. Nevertheless, the English Enlightenment can still serve as a useful shorthand for historians, identifying a particular constellation of related attitudes and practices that were prevalent in certain sections of English society during the second half of the eighteenth century.[5] The dissenting science that Priestley promoted treated experimental natural philosophy as a political and religious weapon that could be used to combat the prevailing social order. His vision of a natural philosophy that was activist, politically engaged and radical clearly resonated with some of his contemporaries.[6]

When Priestley wrote those words in the preface of his *Experiments and Observations on Different Kinds of Air* in 1790, Thomas Beddoes was still Reader in Chemistry at Oxford, Humphry Davy was an indolent grammar-school boy in Penzance, and Edmund Burke was penning his *Reflections on the Revolution in France*. Burke's vitriol-charged pen would also have an important role in defining the place of electricity—from Tory perspectives at least—over the coming few decades. Electricity, as far as Burke and fellow-travelling Tory hacks were concerned, was a dangerous revolutionary spirit like mesmerism or pneumatic chemistry. Experimental philosophers such as Priestley who dabbled with the seductively dangerous fluid were as dangerous as revolutionaries themselves. Burke thought the revolution was electric too, after all, and its supporters the 'true conductors of contagion to every country'.[7] The practice of experimental philosophy in general was itself deeply suspect. Curious philosophers who took nature apart to see how she operated were all too likely to do the same to people and to the social fabric as

well. It was precisely their cast of mind that made them particularly susceptible to dangerous ideas. The French revolutionaries and their English supporters were like 'geometricians' and 'chemists' who 'consider men in their experiments, no more than they do mice in an air pump, or in a recipient of mephitick gas.'[8]

The view that Burke and others promulgated about electricity and experimental natural philosophy's place and associations was clearly both seductive and effective. It can be seen at work in John Corry's satire, even if Corry himself had no particular sympathy with the ideological underpinnings of such a perspective. Even as late as the 1830s, the portrayal of Priestley and his like as natural philosophers who had compromised their integrity by dabbling in political controversy continued to resonate. When metropolitan chemists and natural philosophers gathered to celebrate the centenary of Priestley's birth in 1833 they still felt obliged to dissociate themselves strenuously from his politics. They argued that their science was superior to that of the 'founder of pneumatic chemistry' precisely because they had not allowed themselves to become prey to party politics as he had done. Their science was therefore uncontaminated.[9] A decade later, Henry Brougham portrayed Priestley as a fallen idol who had betrayed his calling as an 'experimental inquirer after physical truth' by succumbing to 'rooted and perverted prejudice'.[10] Much of the way in which early Victorian gentlemen of science carefully positioned their practices can be understood as a repudiation of what they regarded as the fatal linkage of experimental natural philosophy and radical political ideology that Priestley (and Beddoes)—as seen through Burkeian eyes—represented.

That Thomas Beddoes was an easy target for these kinds of attack from political opponents is clear. The pneumatic project he established at Bristol after his enforced departure from Oxford in 1793 lent itself to satire. The spectacle of sober philosophers turning themselves anything but sober by inhaling copious quantities of the 'mighty pneumatic' looked like a gift to anti-Jacobin caricaturists and pamphleteers, and they took full advantage of it. Priestley and his electrical researches made a similarly attractive butt for anti-Jacobin jokes. There is a characteristic cast to these Tory satires. Attacks such as these worked by raising questions about bodily discipline, self-control and sociability. If Priestley or Beddoes could be pictured as being out of control, that raised the spectre of hidden powers behind them, pulling at the puppet-strings. Demagoguery and charlatanery were common accusations levelled at radical philosophers, too. Both electricity and the products of pneumatic experiments could be made to look like stratagems that could sway the emotions of the mob, making them easily seduced by the unscrupulous. Radicals were pictured as simultaneously hopelessly deluded and deviously manipulative quacks and hucksters unable to see the mismatch between their own utopian fantasies and the world around them. They were living in an experimental dream.[11]

In this paper I wish to take this Tory clumping of categories, ideologies and practices as a starting point for raising some questions about radical galvanism and its places and contexts at the end of the eighteenth century and the beginning of the nineteenth. In particular, I am interested in the impact of this portrayal of galvanism's cultural place on galvanism's future trajectory. In this respect it does not matter to what extent this Tory view was accurate or not. What matters and is interesting is how the perception came to be accepted in large part as accurate. Even if Beddoes had not been interested in galvanism—and he was—he would have a place in this account simply because his political enemies put him there. The point I wish to make is a relatively simple one—just that galvanism, like pneumatic chemistry and other novel late Enlightenment experimental practices, was subject to a great deal of

interpretative flexibility. There was no fixed meaning for galvanic experiments at the end of the Enlightenment. What galvanic experiments might mean tended to depend on where they were conducted and by whom. Even there, they could be differently read by the various participants. Significances might be quite local as much as universal in their scope. Galvanic experiments often meant different things to different groups and individuals. Galvanism's radical and materialist implications were certainly not self-evident. They had to be argued for—both by supporters and by detractors.

Radical galvanism

The radical supporter of the French revolution and leading member of the London Corresponding Society, John Thelwall, certainly made electricity political (if Priestley had not done so already) with his forthright attack on John Hunter's vitalist outlook, in a lecture to the members of Guy's Hospital Physical Society in January 1793. By the 1790s, Thelwall was a well-known London radical. He was a prolific writer and lecturer, having made a name for himself as a political speaker in debating societies such as the Society for Free Debate, meeting at the Coachmaker's Hall. He was a close friend of veteran radicals such as Horne Tooke. The London Corresponding Society was largely made up of politically active working men, but it also included several physicians and surgeons among its members. During the early 1790s Thelwall had added natural philosophy and medicine to his own list of interests. He attended the radical surgeon Henry Cline's anatomical lectures and was a friend of Astley Cooper, himself notorious during the 1790s for his republican sympathies. It was probably through his links with Cooper that Thelwall became a member of Guy's Physical Society and a frequent contributor to their meetings. In 1794, Thelwall, along with Horne Tooke and other London Corresponding Society stalwarts, was tried for treason, and Cline's evidence for the defence was a key factor in their acquittal.[12]

In his lecture to the members of Guy's Physical Society, Thelwall had lambasted John Hunter's view (or, rather, the view he attributed to Hunter) as 'completely incomprehensible'. It made no sense to think of life as something superadded to matter—it was either matter or it was nothing at all. Thelwall argued that life was simply a particular state of organized matter that only needed some specific stimulus to set it in motion. The most likely candidate for being that stimulus was electricity:

> what can we discover so competent to the task—so subtile, so powerful, so nearly approaching to that idea of an ethereal medium, which some philosophers have supposed necessary to complete the chain of connection between the divine immortal essence, and the dull inertion of created matter, as the electric fluid?[13]

His performance at the Society attracted significant attention. Any attack on the ailing John Hunter (who died later that year) would have appeared heretical to some of his audience, let alone an attack that promoted the kind of blatant materialism that Thelwall seemed to advocate. Thelwall, who later in the 1790s was to contemplate joining Coleridge and Southey in their projected utopian enclave in the West Country, on the fringes of Thomas Beddoes's Bristol circle, continued to fulminate against those 'hireling plunderers' who had set out to 'declare open, inveterate, irreconcilable war... not only against the lives, properties, and liberties, but against, the opinions, feelings, inclinations' of the common man.[14]

This, then, was galvanism's political context for Thelwall's fellow-travellers in the radical circle surrounding Thomas Beddoes as he transited from Oxford to Bristol and the Pneumatic

Institute. Beddoes's first biographer noted that even as he was being ousted from his Oxford sinecure for his heterodox politics Beddoes was enthused by Galvani's discoveries, entering into the experiments 'with his characteristic ardour.' He told one correspondent that he hoped that galvanism might prove the foundation of a 'new system of medicine'.[15] The youthful Humphry Davy, attracted by Beddoes from Penzance to Clifton, was similarly enthusiastic. In his first effusion as Beddoes's new protégé, Davy took for granted the identity of the electric fluid and the nervous influence, arguing that electricity itself was in fact 'condensed light', providing 'another cogent reason for supposing that the nervous spirit is light in an ethereal gaseous form.' Life, in that case, was 'a perpetual series of peculiar corpuscular changes', and 'perceptions, ideas, pleasures, and pains, are the effects of these changes'.[16] Other members of the circle, such as Samuel Taylor Coleridge and Robert Southey, were enthused by the latest discoveries and by Davy's involvement. Southey speculated to Davy that Volta's experiments showed that 'as the galvanic fluid stimulates to motion, that it is the same as the nervous fluid; and your system will prove true at last.'[17] Davy's early writings are often dismissed as juvenilia (not least, as we will see later, by Davy himself) to be discarded when more mature and sober experimental judgement supervened. We nevertheless need to remember that they represent Davy as he was at the turn of the new century, with views on natural philosophy and its culture that meshed comfortably with those of others in Thomas Beddoes's circle.

When Coleridge learned that his friend was about to lecture on galvanism at the Royal Institution, after his move to London, he wrote to Davy that his 'motive muscles tingled and contracted at the news, as if you had bared them, and were *zincifying* their life-mocking fibres.'[18] Their mutual friend Southey seems to have recognized that Coleridge and Davy had a great deal in common in their attitudes to galvanism and its metaphysical significance. He complained that 'Coleridge and [Davy] have a knot of union in their metaphysics, a foul weed that poisons whatever it clings to.'[19] What Southey meant was that the two enthusiasts were more interested in the woods than the trees. They liked grand unifying theories and were impatient of mere facts. Southey, although he disliked Beddoes personally, did not think that he shared Coleridge's and Davy's weakness for wild speculation. He wrote to a friend after his death that 'Beddoes's mind was so rapidly progressive, so quick in out-growing error and so indefatigable in the acquirement of facts, that his books became imperfect representations of their author's opinion and knowledge—almost before they were thro the press.'[20] The remark highlights the ephemeral and malleable nature of the ideas and connections that were being toyed with in Beddoes's circle during the 1790s—and galvanism's place in their political philosophies.

Even as Southey was complaining about Davy's 'knot of union', Davy himself was rapidly reassessing his own view of galvanism as he moved from Bristol, and Beddoes, to London and a new coterie of patrons. John Davy's *Memoir* of his eminent elder brother makes it clear just how sensitive Davy was in later life on the topic of his youthful galvanic speculations. He certainly went out of his way to make quite clear how thoroughly the mature Davy disavowed his younger self's enthusiasm. The excuses that John Davy made for his sibling's excesses are themselves significant. As he put it:

> the period of his youth was one of peculiar excitement and innovation: the leaven of the French revolution was still fermenting; the mysterious phenomena of galvanism had recently been brought to light; the muscles of animals, apparently dead, had been made

> to contract by the new influence, as if reanimated; and pneumatic chemistry had just then been called to the aid of medicine, with a confident expectation of wonderful effects, which deluded men of the soundest minds, and which could be corrected only by experience.[21]

Davy, in other words, had been deluded by forces that had left strong men reeling. He had been a victim himself of the revolutionary mania, temporarily infected by what Edmund Burke had called an 'epidemical fanaticism'.[22]

Galvanic London

Just as Davy arrived in London in March 1801 to take up his position as Thomas Garnett's assistant at the recently established Royal Institution, the announcement of Volta's spectacular new invention was reviving the metropolis's instrument-makers' and natural philosophers' interest in, and enthusiasm for, galvanic experimentation. Galvani's experiments had already captured the imagination of natural philosophers interested in investigating the connections between electricity and the nervous fluid. Ironically enough, Volta's challenge and his invention of the voltaic pile in his efforts to see off animal electricity served to keep Galvani's ideas alive and kicking. Interested natural philosophers, doctors and instrument makers such as John Cuthbertson, William Nicholson and Joseph Carpue were industriously tinkering with their apparatus as well, improving Volta's design and looking for new experiments with which to impress the public and their fellow philosophers. Over the next decade, Davy would make his reputation as the doyen of the metropolis's natural philosophers by making the voltaic pile his own particular province. This was, as we shall see, in the face of competing views of galvanic experiments' significance. Natural philosophical journals, gentlemen's magazines and newspapers alike were awash with news of the latest developments in galvanism. Nicholson in his *Journal of Natural Philosophy* and Alexander Tilloch in his *Philosophical Magazine* rushed to print the latest galvanic news from the continent. There was plenty of meat here to fuel materialist speculations as well as Tory diatribes.

When Giovanni Aldini visited London in late 1802 and early 1803 in an effort to defend the reputation of his uncle, Luigi Galvani, and the latter's claims concerning the existence of a distinct animal electricity, the kind of satirical context noted at the beginning of this paper certainly informed some of the ways in which his experiments were contextualized by contemporaries.[23] Aldini performed his repertoire several times during his visit to London. He gave public lectures and dissections at the Great Windmill Street Anatomical Theatre, at Guy's Hospital and at the physician George Pearson's lecturing rooms in Hanover Square. Some, at least, of the Royal Society's Fellows were suitably impressed. 'Here then we have the most decided substitution of the organized animal system in the place of the metallic pile: it is an animal pile; and the direct production of the galvanic fluid, or electricity, by the direct or independent energy of life in animals, can no longer be doubted', enthused one of them: 'Galvanism is by these facts shewn to be animal electricity; not merely passive, but most probably performing the most important functions in the animal economy.'[24] The highlight of his visit, nevertheless, was his public electrical dissection at the College of Surgeons of George Forster, hanged for murder at Newgate, on 17 January 1803.[25]

I wish to devote some space to discussing Aldini's experimental performance on the corpse of George Forster for a number of reasons. In the first place, Aldini's galvanic

performances represented just the kind of electrical excesses that Thomas Beddoes's opponents also detested. Whether Aldini knew it or not, he and Beddoes had enemies in common, as John Corry's linking of the two as objects of mutual ridicule attests. Aldini's galvanic experiments during his London visit provoked quite similar reactions from both opponents and supporters, as did Beddoes's pneumatic trials at Bristol. In some respects at least, therefore, for friends and enemies alike, they occupied a similar place in experimental culture. Aldini's experiments also bear discussion in this context because of Humphry Davy's own response to them. Davy, as we shall see, regarded Aldini's experiments with Forster in particular as, at best, irrelevant and tangential to the mainstream of galvanic investigation as he regarded it. I wish to suggest that Davy's rejection of Aldini is emblematic of his broader rejection of Beddoes's own experimental approach and the broader project of Enlightenment sensationalist experimental philosophy more generally.[26] Davy's disavowal of Aldini's experimental practices therefore stands at the root of his own espousal of galvanism as disembodied, insulated from the culture of sensation and subsequently re-embodied in the new and powerful instrumentation that he developed during his early years at the Royal Institution.[27]

Newspaper accounts described the gruesome experiment on Forster as having been performed 'under the inspection of Mr. Keate, Mr. Carpue, and several other professional gentlemen'.[28] Thomas Keate was there to represent the College of Surgeons in what was, after all, a judicial ceremonial proceeding. According to Joseph Carpue, he and the instrument-maker John Cuthbertson had active roles in the experiment. He describes how, after the body had been cut open, 'Mr. Cuthbertson and myself immediately, by the desire of Sig. Aldini, applied the conductors to the heart, Mr. C. to the right ventricle, and I to the left.'[29] It seems likely (if Corry is to be believed, if for no other reason) that the surgeon Charles Wilkinson was also a participant. Aldini wanted to use his experiments on Forster to demonstrate a number of points concerning the interaction of electricity with the body. The application of electricity to the heart described by Carpue, for example, was an attempt to see whether galvanism had a distinct effect on that organ—a point over which Aldini was in dispute with some of his Italian colleagues, with Aldini denying and they affirming that galvanism could cause the heart to resume beating. Although Carpue thought he had detected movement, Aldini and all others present concluded that electricity had no effect in this instance.[30] Other effects were rather more spectacular however. *The Times* described how 'the jaw of the deceased criminal began to quiver, and the adjoining muscles were horribly contorted, and one eye was actually opened. In the subsequent part of the process, the right hand was raised and clenched, and the legs and thighs were set in motion.'[31]

Aldini, writing about the experiment much more than a decade later, clearly resented some of the more lurid descriptions of his experiment. He described it as 'a prostitution of galvanism, if it were only employed, to cause sudden gestures, and to convulse the remains of human bodies, as a mechanic deceives the common people by moving an automaton by the aid of springs and other contrivances.'[32] It seems hard to resist the conclusion that this was nevertheless partly what he was engaged in doing with what was left of George Forster. This raises the question of just how flexibly Aldini's performance might be read and represented by others. *The Times*'s correspondent certainly appeared intent on underlining its more grisly and sensational aspects. Carpue, in his account of the proceedings, emphasized the attempts to get Forster's heart moving again, writing as he was in the context of an interest in resuscitation. *The Times* described how it 'appeared to the uninformed part of the

bystanders as if the wretched man was on the eve of being restored to life' and suggested it demonstrated the potential use of electricity in cases of drowning 'by reviving the action of the lungs, and thereby rekindling the expiring sparks of vitality.'[33] This was a common reading. In 1819, Aldini described the experiment on Forster as part of a series of attempts 'to make an application of galvanism to persons apparently drowned, or in the state of asphyxia'.[34] There were plenty of alternative readings as well, nevertheless, particularly in the context of political radicals' efforts to turn galvanic experimentation and electrical bodies to their own purposes. Aldini's experiments on Forster were routinely trotted out by radical writers as evidence of the material and electrical basis of human life.[35] Galvanism was at once the plaything of fashionable dilettantes, the hope of radical firebrands and the *bête noire* of conservative ideologues. The performance remained susceptible to multiple representations, nevertheless. What Aldini had done could be regarded as anything from an exercise in the possibility of artificial resuscitation, to an effort to resurrect the dead, to a conclusive demonstration of the electrical and material nature of the vital principle.

It could also, of course, simply have been another show to whet the jaded appetites of aristocratic pleasure seekers. When Aldini performed at the Great Windmill Street Anatomical Theatre, for example, his audience included General Andreossi, the French ambassador, along with his entourage; Argyropoli, the chargé d'affaires of the Ottoman Porte; and the ubiquitous antiquarian Sir William Hamilton. A subsequent performance was attended by no fewer than four peers of the realm, including the rising political star Lord Castlereagh. The Prince Regent patronized one of his performances. The dissolute George certainly had not the slightest interest in the politics of galvanism (although Lord Castlereagh might have done). He was there simply to be amused. For such onlookers, performances such as Aldini's were simply one more in the range of entertainments that the capital city offered. They went to see Aldini's electrical dissections in much the same spirit as they went to the theatre, were pleasurably titillated at the phantasmagoria or seduced by the latest panorama.[36] The Prince enjoyed Aldini's show enough that he brought his brothers along for an encore. The instrument-maker John Cuthbertson described how he 'had the honour of performing in the presence of their Royal Highnesses the Prince of Wales, Duke of York, Duke of Clarence, and Duke of Cumberland' on the decapitated head of a dog, 'appearing as if the animal was restored to life and in a state of agony'.[37] In this respect, if in no other, there was nothing even remotely radical about galvanism. On the contrary, Aldini's experiments were conducted with the full blessing of the English state. When Aldini performed his galvanic dissections on the body of George Forster, he was quite explicitly performing a role that was designed to underline and reinforce the judicial power of the state. His experiments on poor Forster were part of the climactic last act in a performance that had begun with the conviction, proceeded with the brutal public execution and concluded with the eventual dismemberment of the criminal's body once Aldini was done with it.[38]

Reframing galvanism

The mutability and revisability of Humphry Davy's view of galvanic ideas and practices and their contexts is clear in his shifting of focus as he moved from the Pneumatic Institute to London. With radical Bristol behind him and the aristocratic Royal Institution beckoning, Davy ditched his radical past with some alacrity. In notes added later to his 1799