

## **Joost Vijseelaar, Psyche and electricity**

Psychiatry as a medical science and the care for the mentally ill both develop in an ongoing interaction with culture and society at large, as well as with other sciences and the humanities. In this respect psychiatry is maybe even more open to external or contextual influences and to a certain extent less 'autonomous' than somatic medicine in general. Amongst others, the scholarly and scientific permeability of psychiatry can be traced back to the character of its chief object: man in both his biological, psychological, social and sometimes metaphysical dimensions. This explains the interrelatedness between psychiatry and disciplines like neurology, psychology and sociology. Alongside processes of demarcation and professionalisation, which can be the object of historical inquiry, the porous borders of psychiatry and its interpenetration with both culture and science make a fascinating subject matter for the historian.

This is true as well for one of the central and much disputed questions in psychiatry, that is the relation between body and soul. This issue is one of the more fundamental strains in the historical development of psychiatry. It is related to fundamental topics as to whether psychiatry should borrow its methods from the sciences or the humanities or whether psychiatric illnesses should be explained in biological or psychological categories.

The use of electricity in psychiatry and the ideas about the role of electricity in the nervous system offer an excellent opportunity to study the history of psychiatry in a longitudinal perspective and in a broad and comprehensive context. As I would like to suggest here, the study of the interaction between what I would like to call the 'culture of electricity' and psychiatry can be a profitable and productive way to make the idea of contextual influence operational, at the level of science as well as on the levels of culture and society.

Ever since electricity became a major subject in science during the first half of the eighteenth century there has been speculation about the meaning of electricity for the functioning of the nervous system and the psyche. At the same time attempts were made to use electricity for therapeutic purposes, a practice that has shown a continuous history ever since. For instance the last 15 years not only witnessed the revival of the electroshocktherapy, but also the emergence of a new field of electric and magnetic brain stimulation in psychiatry. The ideas behind these experimental

therapies do show some intriguing similarities with older concepts in medical electricity.

The phenomenon of 'electricity', taken in the broadest sense, has the advantage of encompassing a wide spectrum of scientific, technological, social and cultural fields and theme's. Many of these bear upon psychiatry in one way or another and can be the object of fruitful historical research. First of all, there is the fact that the theme of 'psyche and electricity' brings together the two 'extremes' of physics on the one hand and the domain of consciousness, the 'self' and the psyche on the other. Speculations concerning the relationship between electricity and the psyche offer a focus for the study of the dichotomy of body and soul during the last two hundred years. For example, in the eighteenth century electricity was regarded by many as akin to or identical with the life force, which made it into the intermediary between soma and psyche. Recent criticism of the electroshocktherapy on the other hand reveals a distance between the perception of electricity and the psyche, which inspires fear and disapproval.

As the example of the eighteenth century demonstrates, developments within the physics of electricity can impinge almost directly upon medicine in general and more specifically upon the treatment of nervous illness. Already in the eighteenth and nineteenth centuries some observers concluded that every major step in the science of electricity and electric technology induced new ideas and practices in the application of electricity in medicine and psychiatry. For example, the discovery of electromagnetic induction by Faraday was followed by the introduction of induction apparatus in the therapeutic arsenal of the psychiatric asylum. This interaction between physics and psychiatry still awaits in depth-research.

Other aspects of the 'culture of electricity' that bore upon the theory and practice of psychiatry are amongst others the introduction and the large scale use of electrical technology in society, more specifically the process of electrification starting in the second half of the nineteenth century. As I will shortly demonstrate, this created the backdrop of major developments in neurology and psychiatry and provided a new imagery that influenced psychiatric thinking. The field of neurophysiology, in particular of electrophysiology, being the fundamental science of the functioning of the nervous system, seems to have acted as an intermediary between physics and psychiatry, a role that should be taken into account.

Electricity and magnetism have always been a fertile ground for ‘pseudoscientific’ theorizing and the development of unorthodox and irregular methods of healing, mesmerism and its offshoots like electrobiology being the most influential illustration of this process. As I have shown in my thesis, animal magnetism and galvanism in combination left their mark on German psychiatric theory in the early nineteenth century to an extent that needs closer examination.

Another domain that begs further investigation is the role of electricity as metaphor, model or symbol in the cultural and scientific imagination and discourse and its impact upon psychiatry. Electricity can be regarded as a kind of ‘cultural plaything’, a neutral element unto which all kinds of meanings and values can be projected: from the vitalizing shock which induced life into Frankenstein; as the medium of ectoplasm in spiritism to the neutral, but life saving current to defibrillate the heart. Psychological expressions in Dutch like ‘overspanning’ (overstrain) or ‘ontlading’ (emotional release or literally: ‘discharge’) hint at the influence of electric images in psychology and psychiatry. Hereafter I will point out how for example electric similes contributed to the creation and the popularity of the new diagnosis of neurasthenia at the end of the nineteenth century.

The interplay between the history of electricity on the one hand and psychiatry on the other can be studied on all these levels and domains: science, technology, the implementation of electricity in society, neurophysiology, unorthodox medicine and the scientific and cultural imagery of electricity. To demonstrate this approach I would like to give two examples of the said interaction: the influence of the new science of electricity upon the treatment of the insane during the eighteenth century; and intertwining of the electrification of society in late nineteenth century with the ideas about neurasthenia.

As contemporaries like John Priestley or in the Netherlands Martinus van Marum noted, the science of electricity made fast headway during the second half of the eighteenth century. The improvements of the electrical machine and especially the invention of the ‘Leyden jar’ around 1745, opened up new avenues for experiment and research in electricity, reinforcing the Baconian, empirical strain in enlightened science. The electrical theory advanced by Benjamin Franklin, based on a monofluidal model of electricity, gave further impetus to this development. Electricity became one of the most promising topics in late 18<sup>th</sup> century science.

From early on, electric experiments were carried out on human beings, the experimenters themselves – like Franklin – included. The drawing of sparks, the raising of the hair or the passage of an electric discharge through a chain of people all became the standard repertoire of the popular 18<sup>th</sup> century ‘physique amusante’. These experiences reinforced ideas about the susceptibility of living organisms for electricity and triggered ideas about the vital importance of this phenomenon. These findings worked out in two directions: first of all in neurophysiological speculations as to the character of the nerves and secondly in the creation of medical electricity.

The sensibility of the nerves for electrical charges stimulated ideas about the possible role played by electricity in the nervous system. Inspired by electrical experiments at the Royal Society in London, earlier in the century Isaac Newton had proposed the existence of ether, being responsible not only for electricity, magnetism and gravitation, but also for the transmission of impulses through the nerves. Backed by the authority of Newton, the idea of an analogy or an identity of electricity and the imponderable nervous fluid gained wide support after 1750. The confirmation of the existence of an electrical charge in the atmosphere and the discovery of electrical fishes like the torpedo, lend force to the idea of the essential role of electricity as a vivifying principle in nature and especially within the nervous system.

According to some, electricity, being inhaled together with the air, was distilled by the brain and transmitted to the nerves. As such, it was the link between mind and sensation, will and movement, body and soul. Illness in general and nervous illness in particular, could be explained by a lack or a surplus of electricity in the nervous system or obstruction of its flow or current.

Experimentation with electricity during the 1740’s gave rise to the notion of electricity as a medical remedy. Especially the astonishing effect of an electrical discharge in paralytic limbs created expectations as to the healing powers of electricity. The second half of the 18<sup>th</sup> century witnessed the growth of medical electricity aiming at a wide range of disease. Nervous afflictions figured prominently among these, considering the affinity between electricity and the nerves. Reports dating from the 1750’s already talk about the treatment of hysteria and other nervous conditions with electricity. The general conviction that nervous illnesses like the spleen, the vapors, hysteria or hypochondria, being caused by the progress of civilization, were on the increase seems to have enhanced the weight attached to medical electricity.

Benjamin Franklin was one of the first to suggest that medical electricity could be tried in cases of real insanity as well. During the last quarter of the century attempts were made in France, England and in Italy to heal madness and deep melancholia by the application of electricity. In Italy it was Giovanni Aldini, professor of medicine in Bologna and nephew of Luigi Galvani, who experimented in the local asylum. According to his reports he had therapeutical successes with two melancholics. Afterwards he suggested it would be worthwhile to introduce electrotherapy in psychiatric institutions systematically, as a benefit to the pitiable sufferers. Visiting Paris in 1803 to promote the ideas of his uncle Galvani on animal electricity, he explained his ideas on the treatment of the insane to Philippe Pinel, the great reformer of French psychiatry. Pinel took great interest in these ideas as well as in Aldini's demonstration of the movements that could be provoked in human corpses by a voltaic current. Like Galvani himself Aldini believed research in galvanism could reveal the secrets of the life-force.

The meeting of Aldini and Pinel more or less symbolizes the beginning of the connection between electricity and psychiatry, an association which as I said continues until today. The development of the therapeutic application of electricity in insanity during the 18<sup>th</sup> century, gives a clear demonstration of the ways in which physics can influence psychiatry.

During the last two decades of the nineteenth century the electrification of western society took off. The implementation of electrical devices, the development of electric lighting, of the electric means of transportation changed every day live within the city's, whereas the introduction of electricity in industry was one of the major factors in what is called the second industrial revolution. Electricity was regarded as one of the beacons of progress.

According to contemporary commentators the resulting modernization of society, heavily contributed to what was regarded as the staggering increase of a new nervous disease: neurasthenia or nervous exhaustion. As George M. Beard, the New York neurologist who 'discovered' neurasthenia, observed in his book *American Nervousness*: 'The experiments, inventions and discoveries of Edison have made and are now making constant and exhausting draught on the nervous forces in America and Europe'. The velocity of modern transportation and communication, the

improvements of science and technology came with a temporary loss in (mental) health.

Within the diagnosis of neurasthenia Beard had brought together a wide range of symptoms ranging from dyspepsia, dizziness, head aches, paralysis, insomnia, obsessions and anxieties that could not be explained by a visible, somatic cause. Beard regarded neurasthenia as a loss of nerve force or a nervous bankruptcy. In this context he used the image of a lighting network, such as Edison had created for the first time in New York in 1882. The central power station of this network was designed for a limited number of lamps; once additional lamps were added to the network the light began to fade or gave out. 'This is the philosophy of modern nervousness', as he said. New tasks abounded in modern society, without man being evolutionarily equipped to perform them. Beard liked to use electric models and metaphors like these in his works on neurasthenia.

Having started his career in medicine as an electrotherapist, Beard saw electrotherapy as a treatment of choice for neurasthenia, electricity being a stimulant both of the digestive and the nervous system. However, Beard did not consider electricity as the life force lodged in the nerves. In close association with the proliferation of neurasthenia, electrotherapy became something of a vogue in psychiatry during the last decades of the nineteenth century.

As Beard had predicted, the diagnosis of neurasthenia took on almost immediately in Germany, the most advanced nation of Europe. Already in the early 1880's German doctors and psychiatrists spoke of neurasthenia as a new and modern epidemic, while it became a custom among intellectuals to characterize their own time as the 'era of nervousness'. Next to the traditional hydrotherapy, electrotherapy flourished in Germany, associated as it was with neurasthenia.

The 'success' of the concept of neurasthenia in Germany, can at least partly be explained against the background of Germany's leading position in the process of electrification. Berlin was the seat of the first electro technical multinationals as Siemens and AEG, and one of the first European cities to electrify. Germany played its part in the new 'culture of electricity'.

In his neurasthenia thesis Beard created an image and a theory in which technological and social modernization, nervous illness and electrotherapy were linked with each other explicitly. Cause, explanation and therapy were brought together in one perspective, electricity being one of the synthesizing metaphors.

Within the context of the new 'culture of electricity' this stimulated the acceptance of the idea of neurasthenia, as is born out by the example of Germany.

In the next few years I hope to start a research program on 'Psyche and electricity', according to the ideas I have sketched out in this talk. As a program focusing on the exchange between different domains of science as well as between a science like psychiatry and society, it fits within the framework of the new Descartes Institute of Utrecht University. Interaction and exchange being at the centre of this research initiative, I would welcome collaboration with some of you, one of the main reason to put my plans before this forum.