

Was Professor Stock right? Ask the History of Medicine

Dr. med. dent. W. Breenkoetter; Source: Biologische Medizin, Nr. 4/1984; p 194 - 197.

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In April 1926 Dr. Alfred Stock, Professor of Chemistry at the Kaiser Wilhelm Institute in Berlin, published a paper entitled: "The Danger of Mercury Vapour". His own illness, which had driven him to the brink of desperation, impelled him "to warn anyone involved with mercury during their work of the danger of this volatile metal".

In a long report he describes his suffering:

"For almost 25 years I experienced increasing ailments, which sometimes became unbearable to the point that I doubted I would be able to continue my scientific work. However, no doctor succeeded in discovering the reason for this condition. The symptoms were: mental dullness, exhaustion, lack of motivation and inability to work—particularly intellectually. The most depressing condition was loss of memory. This continually worsened, so that eventually I came close to total memory loss. I forgot telephone numbers on the way to the phone, I forgot all I had learned, and I forgot my own published scientific work. In addition, I suffered from depression and tormenting restlessness. Normally high-spirited, I now shied away from company, avoided society, kept out of people's way and shunned social contacts. I lost pleasure in everything. My sense of humour disappeared and obstacles which seemed no problem at all before, now appeared insurmountable."

In the early twenties, Stock's co-workers also started to complain of health problems which were quite similar to his own initial symptoms. Dr. Lewin, the most distinguished German toxicologist of the time, was consulted. He stated with certainty that all who had fallen ill at the institute were suffering from mercury intoxication. Indeed, tests showed there was mercury in the air of the laboratory as well as in the urine of all the sufferers. Stock had been in contact with mercury for 25 years but had never considered that mercury vapour might have an impact on his health.

Lewin urgently recommended taking the utmost care in laboratories and also advised removing amalgam dental fillings. This advice drove Stock to perform his own trials. He determined the amount of mercury released from amalgam dental fillings under body-temperature and, in three different tests, found it to be 0.487, 0.9 and 1.27 micrograms per day¹. A filling which had been in place a long while released 2.1 μ g/day. (The limit for drinking water is 0.004 μ g/litre (Germany 1984)). Stock urgently demanded that amalgam should be avoided whenever possible. "It will become evident one day that the careless introduction of amalgam into dentistry was a grave sin against humanity."

Stock was one of the most distinguished chemists of his time. His name and reputation ensured that great attention was paid to his publications. Medical journals, lay press and radio picked up the subject matter. Among the dental community, however, a storm of indignation arose and it was argued that although millions of people had had amalgam fillings, mercury intoxication had never been observed. The Society of German Dentists declared Stock's accusations unjustified. This rejection motivated him to continue what he felt was his missionary struggle. A tide of reports about patients with mercury intoxication, findings of an 1) In the German reprint in "Handbuch der Amalgamvergiftung" by M. Dauderer there are milligrams given instead, which is impossible. Stock's original text has not been consulted. investigation that took place at the Charity Hospital Berlin, results from trials with animals and from pathology on corpses showed him that exposure to small quantities of mercury over a long period would damage human health. Until his death in 1946, Stock's publications list some 50 papers dealing with mercury, mostly directed against dental practice.

Stock queried past events as well. Faraday's loss of memory, Pascal's infirmity, the intermittent memories of Berzelius, Liebig, Woehler and health complaints of Hertz and Oswald pointed to mercury intoxication. All had worked with mercury during their lifetime. It is surprising, however, that Stock did not follow another more obvious clue. His accusation that the careless introduction of amalgam was a grave sin against humanity, leads us to ask when amalgam was introduced? And furthermore, did any illness appear at the same time which had not been known previously? Research into these questions would have given Stock serious arguments in support of his suspicions. Surprisingly, up until now nobody has endeavoured to investigate the history of medicine in the light of Stock's contention.

The nineteenth century, and the entry into the industrial age, witnessed turbulent scientific development. German medicine soon led; only in dentistry did it, along with the rest of Europe, lag behind. In this field, the dentists of America were ahead. This great land had left its pioneer years behind; England's guardianship had been shaken off. Free from repression and not held back by tradition and arrogance, a society arose in which all had the chance to develop according to their abilities. Trade and industry flourished. Wealth was widely distributed unlike anywhere else in the world. Probably this coinciding of freedom and wealth explains why dentistry in America outstripped that of other countries. At this time dental treatment was the privilege of the wealthy. In Europe the broad mass of people were poor. Therefore how could a profession develop if there was no demand? In America, however, a healthy dental community was developing. Even if some were disreputable, this community also produced capable dentists who laid the foundations for our present standard of dental medicine.

From early on dentists had tried to conserve teeth affected by caries. Searching for a material easy to handle, they discovered amalgam. The point at which this silver/mercury was first applied is well established. In 1830 the Crawcour family of London-based dentists began filling dental cavities with amalgam. Unfortunately the Crawcours were unworthy representatives of their profession. Without removing any caries they took only minutes to cram amalgam into cavities and promised their patients miracles. In 1833 two Crawcour brothers settled in New York and with them the amalgam age had begun. Their treatment room was elegant, their manners excellent, but their methods deceitful. Nevertheless, the wealthiest citizens became their patients and in a short time, the Crawcours had made a fortune. This highly-profitable "treatment" was imitated by many. There are no statistics to show how many 'dentists' set up in business to fill teeth but in 1830 the number of dental establishments in the USA was about 300, by 1835 this had more than doubled, by 1842 there were 1400 and by 1847 the number rose to 1600-1700. Many of the practitioners had few scientific qualifications. Their serious colleagues began to oppose the methods of the Crawcours and their followers. This was the "first amalgam war". The attacks against the Crawcours were justified. The amalgams were of inferior quality; they did not hold sufficiently but broke up easily and contracted. It was also feared that mercury in the amalgam might evaporate and intoxicate the patients. However, this could not be proved scientifically. Mercury poisoning was well known in medicine and the opponents of amalgam had predicted mercury poisoning as a consequence of its use. However, their prognosis was not confirmed. In spite of the increasing number of amalgam dental fillings, no poisonings occurred. The main argument against amalgam collapsed and, in consequence, amalgam's opponents lost the battle.

This extraordinary controversy did not touch Europe at all. The standard of European dentistry was far below that of America. Germany lagged behind even England and France. The advanced position of American dentistry at that time provides an exceptional opportunity to check Professor Stock's accusation retrospectively. Several decades before the rest of the world, only in America were amalgam dental fillings

introduced into human bodies. It was like a laboratory test in vivo on an enormous scale. If indeed amalgam fillings do affect people's health, this must have shown up more than 100 years ago in America. The foretold mercury poisoning did not occur. However, is it possible that the effects on health did appear, but that the connection with mercury was not recognised? This is a challenge for medical history. The questions may be set out clearly.

- Did a hitherto unknown illness appear in America after 1833?
- Did this illness continue to escalate?
- Was this illness restricted for some decades to America?
- Did this illness affect all levels of the population?
- When and in what sequence did it later affect Europe?
- Was the aetiology of this illness known?
- Was there a successful treatment?
- Were the symptoms of this illness similar to those described by Stock?

The history of medicine indeed has answers to these questions.

Starting around the middle of the 19th century, hitherto unknown health disorders began to alarm American doctors. Initially they believed that they could classify these frequent but difficult to define, vague and barely tangible symptoms, this anxiousness, fatigue, irrational fear, mental weakness and hopelessness, as hypochondria or hysteria. However, they soon recognised that they were confronted with a new, hitherto unknown illness. Too many of the symptoms of hypochondria and hysteria were absent. Furthermore, its spread proved that its pattern could not be classed with that of known diseases. Initially only a few patients showed symptoms, but within years there were thousands and eventually hundreds of thousands.

George M. Beard, a neurologist from New York, devoted his life to researching this illness. He was the first American doctor to find a place in the history of medicine. Born in 1839, from 1866 he specialised in electrotherapy and neurology. He discovered his field of research when he realised how many Americans suffered from "American nervosisme". He collected endless lists of complaints and catalogued dozens of symptoms. It seemed impossible to bring the many manifestations into line. The search for organic irregularities was unsuccessful. Despite intensive research Beard did not find any clue as to the reasons for this strange illness. Nevertheless, he was convinced that the numerous complaints represented the symptoms of a single disease. Lacking any plausible explanation, Beard considered that natural weakness of the nervous system was responsible for it. He stressed that a patient's constitution and intellectual capability are inborn and so the strength of the nervous system is predetermined. A dynamo, he pointed out, restricted to a 100-lamp capacity will break down when another 500 lamps are connected. Our nervous system follows similar laws. A man endowed with nervous energy can easily waste it; a man low in energy will collapse when overloaded. With that explanation Beard was able to account for the various symptoms. He called the illness neurasthenia and classified it as a functional disease which means that the reasons for it were not known at the time. Beard was convinced that at some point in the future its cause would be found. He emphasised strongly that neurasthenia was neither a mental nor an imaginary disease. It was as real as smallpox, typhoid or cholera, and as body-related as a broken leg.

Furthermore Beard stated that neurasthenia was an American disease. While it grew into epidemic dimensions in America, it was scarcely to be found in Europe. Beard was very familiar with Europe; he had travelled there several times and was well aware of the state of its medical knowledge. He respected German medicine highly. The acceptance of his interpretation of the illness by German colleagues would have enhanced his position in America. However, German medical opinion, remained silent.

In Germany the illness was simply too rare to attract attention and be studied and described. Only after Beard's death in 1883 did neurasthenia start to spread throughout Germany. Beard's remark that "neurasthenia is an American disease" remained correct for several decades.

There was a further equally extraordinary sign of "American Nervousness". It affected only wealthy people. In factory areas, in poor quarters and out in the country it did not appear. The sufferers were high class. In some states the illness could be found "in every house where the inhabitants were engaged in intellectual pursuits".

Beard had found an explanation for the illness. Nevertheless, what was the reason that nervous energy failed solely in one class of society and particularly in the USA? There was only one possibility. Neurasthenia must be the result of American civilisation and its social order. For Beard, the triggers were steam power, the telegraph, the press, women's intellectual activities and unlimited freedom for all. In these achievements America was decades ahead of all other countries and so was their medical consequence, neurasthenia. The successful were successful thanks to their sensitive nervous system. And this sensitivity made Americans susceptible to neurasthenia.

In Europe neurasthenia was scarcely to be found. "Germany, Russia, Italy and Spain are acquainted with it least, it is more frequent in France, and has spread even more throughout England" (Beard). Only in the last decennium of the nineteenth century did it appear in Germany and became the most common nervous illness. German medical literature began to deal with it late. In 1883 Stein commented as follows: "In German literature neurasthenia is poorly represented because patients belonging to better-placed classes are generally still classified as hypochondriacs". Twenty years later there was plenty of literature about neurasthenia in Germany. German scientists too saw the unexpectedly fast progress of humanity as an element to which our brains had to be adjusted. "The new means of transport, telegraph, telephone, universal defence system, and compulsory schooling is ruining our nerves."

Several ways were tried of treating neurasthenia. Beard had his own special remedies; in Germany diet and water treatments, sea bathing and electro-treatments were applied. Nothing really helped. Up until today no light has been shed convincingly onto the gloom that has obscured the illness neurasthenia.

The history of medicine has clear answers. From 1833 onwards amalgam was in use in America. A new illness, neurasthenia, appeared. For decades amalgam was in use only in America. For decades neurasthenia remained an American illness. Dental treatment was a privilege of the wealthy classes. Neurasthenia was the illness of the wealthy classes. England was the first to adopt American dental practice, France followed and Germany even later. Beard discovered that neurasthenia penetrated Europe in the same sequence. The reason for the illness was not discovered nor was any successful treatment. If we compare Stock's health problems with the symptoms of neurasthenia we see a large degree of similarity. Even succinct formulations in the early literature are to be found in the same words in Stock's writings.

Therefore we are forced to ask: Did Stock not suffer from mercury intoxication at all but from neurasthenia? That Stock's disease was mercury intoxication was never doubted. Nevertheless, we must counter this by asking: Was neurasthenia not a disease sui generis, was it mercury intoxication? This question, arising from demonstrable coincidences, has never been considered by the medical profession and cannot be answered by the literature.

One author, however, provides some hints, George M. Beard! Already in the introduction to his standard work he states: "Neurasthenia is an American disease,

insofar as it is present far more in America than in any other part of the civilised world and was first described here (equally with tooth decay which is frequently one of its symptoms).” An even more conclusive passage of text reads: “Rapid decay and tooth irregularities are symptoms of neurasthenia. They are also consequences of the impoverishment of the nervous system. It is undeniable that early tooth decay is one of the results of civilisation. Teeth are seldom healthy when the general physical condition is weakened and in this event only the skill of modern dentistry will maintain them in working order. Dentists, therefore, are barometers of modern civilisation. Their increase in numbers and their prosperity are instructive for modern sociology. American dentists are the best in the world because American teeth are the worst. Among the social classes of America which are used to intellectual work and lead office lives teeth usually start to deteriorate before the age of 20 and only very seldom is a patient of 35 or 40 with a nervous complaint seen to have healthy teeth, regardless of the degree of care which has been spent on preserving them. It is most probable that where someone has their own teeth, most will be filled and remain intact only by the skill of dentists.” 2

Bear’s striking remark about his patients’ ruined sets of teeth and their dental fillings should be the subject of further research. More than likely in America documentation exists providing evidence about the medical and dental treatment of neurasthenic patients. It would be tragic if dentistry which was so respectfully commented on by Beard had such a disastrous connection to the illness on which he devoted his life’s work.

I am not a historian, nor a neurologist nor a scientist. I am one of thousands of dentist going about their daily work. I do not feel authorised to draw conclusions from my studies. On the contrary, the thought haunts me that the propositions in this article might be taken up too quickly and without a critical approach. If an investigation into medical history were to bring us new insights, science could subject them to unbiased examination.