

Franklin's Forgotten Triumph: SCIENTIFIC TESTING

*One of his least-known
contributions to modern
life is also one of his
most important*

By Stephan A. Schwartz

"Millions of asthmatics and hay fever sufferers could be spared the misery of severe attacks by a new vaccine," the newspaper story begins. "Clinical trials suggest new cancer drug may save thousands of lives," the television news anchor intones. "Children who received the medication developed long-lasting resistance to measles compared to those who received a placebo," the brochure in a pediatrician's office reads.

In a thousand ways our lives are influenced by what is known as the blind protocol. Its basic elements are simple to understand. Take a group of people. Randomly assign them to one of two populations. One receives the real medicine, while the other gets a sugar

pill, or sham treatment, known as a placebo, with both researchers and patients blind to which is which. Every pill we take, every nasal spray or medical patch we use, has been subjected to the judgment of the blind protocol. It is the entry price demanded by the Food and Drug Administration before the gates to the American drug market will open.

Doing science this way is important because what a researcher wants or expects can influence what they observe, or how they interpret what their data is saying. If no one knows which is which until the data collection and analysis are completed, then the potential for bias is eliminated. This is why the blind protocol has become the gold standard of the life sciences. But where did the idea begin? Even scientists are surprised to learn that this critical tool of modern research was created by the extraordinary Benjamin Franklin.

Today, we don't often think of Franklin's scientific research except in terms of his work on electricity, and his story of flying a kite in a thunder storm. But if his electrical work, diplomacy, and statesmanship did not overpower his other achievements, he would still be an historically significant individual for his studies in a half a dozen other disciplines. He was the first meteorologist in America, the first geographer, the first oceanographer, an inventor of medical apparatus and, least known of all, the first parapsychologist - a discipline which studies extraordinary and anomalous human functioning. It was in this last capacity that he created the blind protocol.

In 1778, Franklin was in Paris, as America's Minister Plenipotentiary to the court of King Louis XVI, when the 18th century's greatest medical rogue, Friedrich Anton Mesmer, came to the city

from Vienna in a cloud of celebrity and controversy. Mesmer had left Vienna rather hurriedly. He had been asked to treat Marie Paradies, a pianist who appears to have suffered from hysterical blindness. After receiving his treatment her eyesight was temporarily restored but the change was so overwhelming that it shattered her nerves and she lost the ability to play her instrument. Unhappily for Mesmer, Marie Paradies was the goddaughter of the Austro-Hungarian Empress, Maria Theresa, and she had taken umbrage at what had happened to Marie. Mesmer had prudently decamped Vienna for Paris, which is where he encountered Franklin.

Well-trained in both medicine and theology, Mesmer was a charming, rational, cultivated man who was admired by people like Mozart whom he commissioned several times to write special musical pieces. Like Franklin, and Mozart, and many of the aristocracy, Mesmer was also a Freemason, then the mark of a man of character. But he also had a flamboyantly theatrical style, more than a pinch of the con, startling theories of illness, and disturbing and erotically tinged methods of treatment. Larger than life he surfed controversy like a wave.

He treated his patients, known as *somnambule*, described by one observer as mostly "hysterical bourgeois women," in groups, during "magnetic seances". Like many intellectuals of the 18th century, particularly those involved with Freemasonry, Mesmer was interested in alchemy and astrology and that may be why he cloaked his treatments in the symbols of these already contested fields. The *somnambule* sat holding hands around a large wooden tub filled with powdered glass and magnetized iron filings. They

were relaxed and brought into *rapport* by the sweet haunting tones of the armonica, a glass instrument whose invention, coincidentally, was another Franklin achievement. The armonica was played from behind a curtain covered with astrological symbols, and produced ethereal sounds that were the 18th century's equivalent of modern electronic consciousness music. At this point Mesmer, cloaked by a long purple robe, would enter. In a performance that was a cross between a modern entertainment hypnotist and a stage magician, he would take the *somnambule* down into a deep trance and give them healing suggestions. Then he would touch them with a white metal wand, sometime rub them, frequently on "the lower abdomen", then command them to awaken rested and cured. It frequently worked, although not for the reasons Mesmer claimed, and this success made Mesmer popular with lay people, and feared by the medical establishment.

How Mesmer discovered the fundamentals of hypnotism, and stumbled onto the rudiments of the psycho-physical self-regulation which lies at the core of such modern treatments as psychotherapy, hypnotism, and bio-feedback is unknown. It may be that he just observed the anesthesia a relaxed trance state produced, and the physiological control it gave subjects over their bodies and minds. However it happened, he seems to have sincerely believed he had stumbled onto the cure for all illnesses.

It is clear though he had no real insight into why the trances worked. Mostly, he seems to have understood from the very beginning of his career in medicine that he needed an explanatory model, and his

doctoral dissertation, *De Planetarium Influxu* (On the Influence of the Planets), written in fulfillment of his degree for the Faculty of Medicine at the University of Vienna, which he published in 1766, is his attempt to construct such an explanation. In its 48 pages he connected hypnotism, a kind of primitive description of cyclical activity in the biosphere (frequently mistakenly described by modern commentators as astrology), electricity, magnetism, and even a variant on Newton's recently described gravity together to explain what he had observed. He would later call the model *gravitas animalis* or *magnetismus animalis* - animal magnetism.

It gave the effects he achieved a certain gloss -- electricity, magnetism, and gravity being the high technology of the day. And we now know where he got the idea for all this. He plagiarized it from one of the most prominent and well-regarded English physicians of the previous generation, Richard Meade (1673-1754).¹ Mesmer's *De Planetarium Influxu* bears a more than coincidental -- indeed, portions are virtually verbatim -- resemblance to the 1746 revised edition of Mead's 1704 book, *De Imperio Solis ac Lunae in Corpora Humana et Morbis inde Oriundis* (On the influence of the Sun and Moon upon Human Bodies and the Diseases Arising Therefrom).

Extending an alchemical belief, another fashionable subject in which he had an interest, Mesmer proposed that there existed a universal "fluid" possessed by all living forms, and that it could flow from one organism to another to the end of manipulating it to affect a patient's

health. It would not be the first time an observable phenomena was linked to an absurd explanation and, as time went on, Mesmer became more and more invested in it, even as it made him more and more a pariah to the medical community.

When he arrived in Paris the French medical establishment, alarmed as much by his entrepreneurial success, as his unfounded theories, made it impossible for him to get a license to practice medicine in the city. Mesmer got around this by partnering with his disciple, the already medically licensed Charles D'Eslon.

As he had in Vienna, Mesmer was soon operating at the very height of the Parisian social pyramid, collecting followers that included the young French aristocrat, and American Revolutionary War hero, the Marquis de Lafayette, as well as no less a personage than the Queen, Marie Antoinette. He was lionized by the glamorous, and Mozart made references to Mesmer and his magnets as a plot device to cure one of his characters in the opera *Così fan Tutti*. So great was his popularity that the terminology of Mesmerism, as it came to be known, was soon part of the language where it has remained to the present day -- his name gives us the verb to mesmerize.

By 1784, six years later, Mesmer felt secure enough to issue a subscription for shares to establish a hospital for animal magnetism treatments, and quickly raised 340,000 livres -- a prodigious sum for the times. This development, his ever greater fame, his hold on the Queen, and

¹ Frank A. Pattie. *Mesmer and Animal Magnetism: a chapter in the history of medicine*. (Edmonston Pub.: Hamilton, N.Y., 1994), pp. 13-27.

the constant lobbying against him by the established physicians who saw his aristocratic patronage as an economic threat to their own practices finally prompted King Louis to establish a commission to investigate his claims.

On the 12th of March 1784, four doctors from the Faculty of Paris were selected. One of them was Joseph-Ignace Guillotin. Although he did not invent it, he championed its use and his name comes down to us because it is linked with the only form of state sponsored legal killing associated with a single country -- France and the guillotine.

The four doctors asked that the Academy of Sciences provide scientists to augment their number, and five were chosen, including Lavoisier the discoverer of oxygen, and Franklin, known throughout the world then as the man who discovered electricity. The king asked Franklin to be the commission's head.

He was now arguably the most famous man in the western world. When Jefferson went to Paris to replace him, he wrote of his friend and mentor, the man with whom he had written the Declaration of Independence, that "more respect and veneration (was) attached to the character of Dr. Franklin than to that of any other person, foreign or native."² He was also a man who lived in considerable pain. He suffered from gout, boils, and 80 years of hard living, and was mostly confined to his house in Passy, a mile from Paris and seven from the king's seat at Versailles. Why he took the assignment is not clear. It may be he

felt obligated to the king. He had just talked Louis, the most autocratic and traditional monarch in Europe, into funding a war of liberation fought by the most revolutionary democracy in the world, at a time when France's financial situation was far from sanguine. Or it may be that whatever the condition of his body, his mind and his curiosity were as wide ranging as ever.

One thing is certain. As was usually the case, Franklin saw deeper into the matter than anyone else, and wrote what may be the first recorded commentary on hypochondria and psychosomatic medicine. On March 19, before the commission formally began its work he said, "delusion may, however, in some cases be of use while it lasts. There are in every great rich city a number of persons who are never in health because they are fond of medicines and always taking them whereby they derange the natural functions and hurt their constitutions. If these people can be persuaded to forbear their drugs in expectation of being cured by only a physician's finger or an iron rod pointing at them, they may possibly find good effects through they mistake the cause."³

Franklin was not up to travelling when the commission began, so the initial meetings were held without him, and without his guidance as to how such an evaluation should be undertaken. Since Mesmer himself could not practice medicine, the members went to d'Eslon's clinic where they found a handsome dimly lit room in the center of which was the wooden tub with its pulverized glass,

² Jefferson VIII, 129.

³ Albert H. Smyth (ed.) *The Writings of Benjamin Franklin. Collected and edited with a life and introduction.* 10 vols. (Macmillan: New York, 1905-7) . Vol. IX, pp. 182-83

and iron filings. In place of Mesmer's armonica, a pianoforte off to one corner provided a musical background. The patients were seated on chairs around the tub, linked together by cords, each holding their neighbor's thumb between their own thumb and first finger. From the tub long articulated iron rods projected, that could be touched to any part of a patient's body. D'Eslon explained to the commissioners that the tub was the condenser and conductor of the animal magnetism. As they watched he walked amongst the patients, touching one or another with a short iron rod, or rubbing his hands over their bodies, particularly the lower abdomen.⁴

The treatments went on for hours as the tension in the room grew. Nervous coughs, hiccups, hysterical cries, sobs, and even convulsions were observed and, d'Eslon told the observing commissioners, were welcomed as signs that healing was taking place.⁵ Nothing was controlled, and the commissioners left with no more sense of what had taken place medically than before they had come. After attending a number of these sessions, on the grounds that they might be disturbing the patients, the commissioners resolved to attend no

further seances, and passed on their findings to Franklin.⁶

Franklin saw none of this as very useful. He might believe in reincarnation, practice meditation, and have an interest in all kinds of phenomena, but he never confused interest with evidence.⁷ What was called for he realized was some kind of controlled protocol and in April, since he could not go to them, he arranged for the other commissioners and d'Eslon to come to him. In late April and early May, and at least once in June, they trooped out from Paris to gather at his residence in Passy.⁸

On the theory that class and culture might explain what was happening, and to allow comparisons between populations, the first session at Passy involved only lower class patients, whose presence Franklin seems to have arranged. They included the asthmatic widow Saint-Amand; a woman named Anseaune, who had a swollen thigh; six year old Claude Renard, scrofulous and tubercular; Geneviève Leroux, who was nine and suffered from what was called St. Vitus's Dance; François Grenet, blind in his right eye from a tumor; a woman named Charpentier who had been thrown

⁴ Carl Van Doren. *Benjamin Franklin*. (Viking: New York, 1938). Pp. 714-717

⁵ *Ibid.*

⁶ *Ibid.*

⁷ *Ibid.*

⁸ I. Minis Hays (ed.) *Calendar of the Papers of Benjamin Franklin in the Library of the American Philosophical Society*. 5 vols. (American Philosophical Society: Philadelphia, 1908.) , vol. III, pp. 186-87, 196.

by a cow two years earlier and never fully recovered; and a man named Joseph Ennuyé, whose reason for being included is not given.⁹ After several hours, four of the seven were not affected at all by d'Eslon's treatments, those who were affected experienced mostly discomfort from having sore spots on their bodies pressed. No cures were achieved.

A few days later the commissioners arranged for four upper class people to be treated: Madame de Bory and Monsieur Romagni, who had no symptoms, of none listed, anyway; Monsieur Moret, who had a tumour on his knee' and Madame de V-----, who had some kind of nervous disorder. To this group was added, Franklin himself, his grandsons, his secretary, and an American officer who had called on Franklin, as well as a group of patients selected by d'Eslon from his Paris practice.¹⁰

Madame de Bory and M. Romagni, felt nothing during the treatment, nor did Franklin, the grandchildren, or the American officer. Madame de V----- almost fell asleep, although whether this was from hypnotism or treatment is unclear. The existing d'Eslon patients were more responsive, which was not surprising, and Franklin suggested what became the first use of blindness and sham treatments in a scientific protocol.

The d'Eslon patients were literally blindfolded -- which is why this protocol came to be known as "blind" -- and treatments continued. As Franklin had hoped this was very revealing. They could not tell when they were being "magnetized", and often thought that they were when they were not, or weren't when they were.¹¹

During another session at Franklin's house they went out into the garden. Mesmer maintained, as did d'Eslon, that any living thing could be magnetized, and he either volunteered or more probably Franklin asked for a demonstration. d'Eslon went over to an apricot tree in the garden and touched it with his wand, supposedly magnetizing it. He said that any one who touched the tree now would be affected. What is clear from all this is that d'Eslon was either a fool, or genuinely believed what he was saying was true. Otherwise why would he expose himself to ridicule? But Franklin, once again, saw the matter not as a question of belief but of evidence obtained under blind conditions.

D'Eslon was required to stand several yards from the tree.¹² When he was in place a 12-year-old boy was blindfolded with a bandage, and led out into the garden. He was taken to stand one by

⁹ Hays III, p. 196.

¹⁰ *Ibid.*

¹¹ Van Doren *Loc. Cit.*

¹² *Rapport des Commissionnaires Chargés par le Roi, de l'Examen du Magnetisme Animal.* Paris 1784. Pp. 19-37

one in front of four trees, three controls and the treated tree.¹³

At the first tree the boy began to perspire and cough. At the second tree he said he felt pain in his head, and languor in his body. At the third he said his headache was now much worse, and volunteered that he felt he was getting close to the magnetized tree. In fact he actually moving away from it. At the fourth tree he fainted, had to be carried and laid out on a grassy area, where d'Eslon revived him.¹⁴

Franklin and the other members of the commission in attendance were satisfied that the experiments conducted at Franklin's house, under the conditions of blindness he had devised, had settled the question they had been asked as to whether animal magnetism was real. It was not.

On the 11th of August they issued their report to the king; it bore each of their signatures. They were unanimous. Benjamin Franklin's signature stood in first position, and such was his preeminence that throughout Europe and America scientists and lay people alike felt that it had been Franklin who had settled the issue. Ever after history has known this first formal study of anomalous phenomena as the Franklin Commission. Mesmerism was dead, and Mesmer soon left Paris. He was lucky. Ten years later Lavoisier would lose his

head to the guillotine, and Dr. Guillotin would just barely miss going under its blade. Mesmer would end up in Switzerland, largely forgotten and ignored where, years later, he would die in poverty.¹⁵

The development of hypnotism, and psychosomatic medicine, and the mind-body issues that it raised, which Franklin had commented on, would be crippled for half a century; an unintended consequence of Mesmer's linking them to animal magnetism.

Although Mesmerism died out in France, the English surgeon John Eliotson (1791-1868) remembered principally as the first physician in England to use the stethoscope, apparently saw through Mesmer's explanatory model to the deeper underlying principle of psychophysical self-regulation in the form of hypnosis that was Mesmer's real discovery. He seems to have avoided all attempts at explaining how it worked, but conducted a considerable number of surgeries using hypnosis as the anesthetic, anticipating its usage in this capacity a century later. So great was the disapproval of Mesmer, however, that no one seems to have understood Eliotson's point.

But the importance of Franklin's blind protocol and sham treatments would not be lost, and would shape the course of medicine ever after.

¹³ *Ibid.*

¹⁴ *Ibid.*

¹⁵ Pattie, *loc cit.*

In 1799, the English physician John Haygarth took the next step with the development of true sham (placebo) treatments. The Franklin protocol compared treatment or no treatment, under blind conditions. Haygarth refined this idea, when he was asked to evaluate a medical device that had arrived in Britain from America.¹⁶ Invented by a Connecticut doctor, Elisha Perkins, like Mesmer's treatments it also was based on the manipulation of an ineffable energy. Perhaps that is what brought the Franklin Commission, and its examination of Mesmer to Haygarth's mind when he was designing his own protocol.¹⁷

Perkins' apparatus consisted of two rods, one of iron, the other brass, about three inches in length. The rods had bulbs at one end, and points at the other, and treatment was effected by stroking the rods over the body at the site of the affliction. Perkins' theory was that the rods drew off a flux that was the cause of the problem. In considering how to go about testing the efficacy of such a device Haygarth says he quite consciously followed Franklin's lead. He describes how he created a true placebo treatment by creating a second set of rods that looked exactly like the metal ones, but which were made of wood, known not to be a conductor. Those receiving a

treatment were blind to which rods were being used. As Haygarth explained it, "...prepare a pair of false, exactly to resemble the true, tractors. "Let the secret be kept inviolate," he wrote. "Let the efficiency of both be impartially tried."¹⁸

In another set of experiments, Haygarth coated rods with wax, also known to be a non-conductor. As the result of using Franklin's blind protocol, and adding his contribution of an actual sham treatment, not just the absence of a treatment, Haygarth could report a conclusion much like Franklin's observations two decades earlier: "The whole effect undoubtedly depends upon the impression which can be made upon the patient's Imagination."¹⁹

Modern day surgeon and medical professor Stuart Green, on the faculty of the Department of Orthopaedic Surgery at the University of California, Irvine, who has traced Franklin's influence through the history of medicine, describes what happened next: Within "A few decades came numerous placebo-controlled inquiries, in Europe and America, into the professed benefits of Hahnemann's homeopathic remedies, which cited the Franklin Commission's strategies. Other blind assessments followed, scrutinizing everything from rheumatic fever and psychologic illnesses

¹⁶ J. Haygarth. *Of the Imagination, as a Cause and as a Cure of Disorders of the body; Exemplified by Fictitious Tractors and Epidemical Convulsions*. (R Cruttwell: Bath, U.K., 1801)

¹⁷ *Ibid.*

¹⁸ *Ibid.*

¹⁹ *Ibid.*

to testicular extract injections and cocaine.”²⁰

Franklin began the idea of the blind protocol in science, and Haygarth added the concept of identical, but sham, treatments. However, the statistical understanding of their day had not evolved enough to supply the final missing piece necessary to conduct modern medical research. This would not come for more than a century. It was finally provided by the English mathematician and statistician Sir Ronald Aylmer Fisher. Beginning in 1919, while working at Rothamsted Experimental Station in England, he began a several year effort that would redefine the entire field of statistics. Franklin and Haygarth made observations about differences between real and sham or no treatment, but could provide no statistical assessment of the power of their conclusions. Fisher figured out how to do that, and augmented Franklin’s blind protocol with the idea of randomization, and calculations of probability, and what he called “likelihood.”

As Dr. Green explains, “The final step in creating a thoroughly modern method of verifying the benefit of a particular treatment followed statistician R.A. Fisher’s insistence that randomly assigning subjects to a treatment group or a control (placebo) group permits valid statistical comparisons between the two groups to some definable level of confidence...”²¹

With that addition, the trail blazed by the

Franklin and his commission has grown to become the roadway in science that largely determines what medicines we take, what chemicals can be used in our environment, and whether we can trust an experiment’s results.

²⁰ Stuart A. Green. “The Origins of Modern Clinical Research.” *Journal of Pediatric Surgery*. (Pre-print, 2002)

²¹ *Ibid.*