

An Explanation of the Powers of Franz Mesmer

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In his lifetime Franz Anton Mesmer was branded a charlatan by the scientific community on account of his claim of being able to cure many sickness and medical problems through animal magnetism. Notwithstanding this, although his specific claim to possess the power of animal magnetism has been discounted, his methods have had a vast influence in every branch of mental healing and spiritual healing and healing through hypnotism as well as New Age techniques that involve not only “the power of suggestion” but also the physical “laying on of hands.” This article reviews Mesmer’s techniques, and gives a broad overview of all the other branches of mental and spiritual healing where his methods are still used in one way or another, and presents recent scientific research that completely vindicates Mesmer’s original claim to possess the power of being able to manipulate the “magnetic fluid” in the living organism. It is now known from radiogenetics that the ferritin in our bodies can be manipulated not only by electromagnetic radiation (radio waves) but also by magnetic fields.

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Introduction

Although Franz Anton Mesmer is immortalized in our language with the verb “to mesmerize”, and his discovery of “animal magnetism” has been reinterpreted over the centuries to mean a sexual power of attraction, only specialists in the fields of mental and spiritual healing are really acquainted with the man Franz Anton Mesmer and what place he occupies in the history of human civilization. This article attempts to rectify that situation and give a testimonial to the greatness and genius of the real person Franz Anton Mesmer who not only was the pioneer of virtually every modern practice of mental and spiritual healing, and profoundly changed modern religious practices in general, but also anticipated by almost 250 years the modern science of radiogenetics where it has now been found that the ferritin in our bodies, which is a paramagnetic material, can be manipulated by electromagnetic waves (radio waves including brain waves) and also by magnetic fields. In other words there really is a magnetic fluid in our bodies and there really is such a thing as animal magnetism as originally claimed by Franz Anton Mesmer.

The Forerunners of Animal Magnetism

There has been a tradition known as the Royal Touch which goes back even before the Christian era. Edward the Confessor in England (1042-1066) and Philip I in France (1067-1108) used the Royal Touch to cure the so-called “King’s Evil” where there was swelling of the neck due to maladies such as scrofula

(tuberculosis of the lymph nodes of the neck) and goitre. In its heyday, the Royal Touch was extensively used. In the five years 1660-1664 Charles II touched 22,982 people (Waterfield, 2002).

Laymen were also known to practice the laying-on of hands as a means of transmitting divine or healing power. Valentine Greatrakes, the “Irish-Stroker”, a squire born in the earldom of Waterford in 1628, experienced a conversion which convinced him that he could channel divine healing power. He cured the King’s Evil, ague (malaria) and a wide range of other ailments. Charles II summoned him to the court to observe his methods. There are many parallels between him and Mesmer, not the least of which is that he was ultimately discredited. His method was massage, mainly over the patient’s clothes (for modesty), but sometimes under, which led to charges of obscenity. His patients too often went into convulsions before being cured, and other times they fell into such a deep trance that they were insensible to pain (Waterfield, 2002).

Deleuze in his *L’Histoire critique du magnetisme* lists three witnesses of impeccable reputation (the scholar George Rust, dean of Connor then bishop of Dromore in Ireland, and two famous physicians Fairclow and Astelius) who attested to his healing powers. Astelius says:

I saw Greatrakes relieve people in great pain simple by the application of his hands. In one case he caused a pain in the shoulders to descend down to the feet of the patient where it dissipated through the toes. The remarkable thing when he was manipulating the problem, and for some reason he was obliged to discontinue, the pain seemed to rest in the place in the body where he had left off, and was not eradicated without a recommencement of manipulations which shunted the pain to the patient’s extremities. When the pain was in the head or the viscera, and he displaced it, sometimes it triggered a most frightening crisis in his patients to the point where one fears for their life, but gradually the symptoms seemed to pass to the extremities of the limbs where they disperse altogether. (Bersot, 1853)

Mesmer, who became prominent towards the end of the 18th Century, may be seen as the key player in a movement which really began with Paracelsus (1579-1644) and led ultimately to the “romantic school of medicine” as a late offshoot of the literary and philosophical movement known as romanticism at the opening of the 19th Century. Paracelsus accused the “doctores” of despiritualizing disease through their mere book-learning and their general attitude towards man as a clockwork machine that could be taken apart and fixed and put together again like you would a broken watch. The doctors “neither knew nor even suspected the existence of the elemental forces of nature, nor recognized the sympathetic current passing from the world-soul to all those who came in contact with the individual” (Zweig, 1933). The romanticism movement proclaimed anew the higher unity of body and soul, and looked primarily to the universal soul of nature to find the answers to the vexed question of sickness and disease (Zweig, 1933). To quote Paracelsus, “You must know that the will is a powerful adjuvant in medicine” (Zweig, 1933). He also stressed the power of the imagination to affect the body: “the spirit is the master, the imagination is the instrument, the body the plastic material” (Zweig, 1933).

Mesmer actually derived the essential elements of his theory from Paracelsus. Because magnetic iron came to the earth from meteors, Paracelsus actually used magnets to cure. He believed that the stars had an influence on man, and these magnetic meteors were part of that influence. He sought to use these magnets to exert a force on the ebb and flow of invisible fluid in which everything exists. The goal was to combine the astral nature with man’s terrestrial nature to achieve a condition of harmony precisely in this invisible fluid (Jensen & Watkins, 1967).

The Geomagnetic Field

Mesmer wrote his medical thesis about the gravitational effects principally of the moon on human beings, which was first put forward by Richard Mead, a friend of Isaac Newton. He was impressed by “the universal gravitation by which our bodies are harmonized” (Mesmer, 1766). Mesmer developed this into a general theory of universal magnetic fluid that explains the influence of the “heavenly bodies” on human beings and indeed all earthly creatures. In fact the existence of the earth’s magnetic field has been known since ancient times, but a formal analytical and scientific expression of it was obtained about 20 years after Mesmer’s death (Dubrov, 1978).

The physicist’s view on the role and significance of the geomagnetic field (GMF) was followed by those of biologists, doctors and naturalists, who were keenly interested in the discoveries of physics. There accumulated a fairly large body of data indicating that the GMF has a very significant effect on processes occurring in the upper and lower atmosphere, on natural regions of the earth, and on climate and atmospheric circulation. The GMF, however, is of special significance for living organisms inhabiting the earth.

There have been cyclical reversals in polarity of the GMF in ancient epochs which have led to evolutionary catastrophes, and there are also quiet and disturbed variations in the GMF in different geographical regions on a day to day basis (Dubrov, 1978). Most of these variations are periodic due to influence of the sun and the moon, and there can also be sharp nonperiodic disturbances due to magnetic storms. In addition there are geomagnetic pulsations, aka the Schumann resonance, electromagnetic waves of very low frequency observed at the earth’s surface, which are due to interaction of the plasma of hydromagnetic waves, coming from the sun, with the earth’s magnetosphere (Dubrov, 1978). In addition the cosmic microwave background (CMB) which pervades the entire universe was first discovered on the earth’s surface as noise in radio telescopes.

Hence, the earth’s magnetic field undergoes continual changes, whose complexity is reflected in changes in various parameters of the GMF. Changes in the GMF are associated mainly with solar activity. This association, however, is not a strict functional relation, since it is the result of the mutual superposition of processes of different scale and different physical nature, i.e. processes occurring in the sun, in interplanetary space, and in the earth’s atmosphere. (Dubrov, 1978)

In modern times there is a burgeoning field of scientific enquiry known generally as magnetobiology which deals generally with the biological effects of the GMF and artificial magnetic fields. Also experiments in space have revealed substantial detrimental effects on astronauts who are deprived simultaneously of two important factors of “earth” existence: gravitation and the GMF including changes in metabolic reactions, particularly in calcium metabolism, reduction of the erythrocyte count, changes in circadian rhythms, and disturbance of sleep (Dubrov, 1978). Indeed recent research has found that the effects on astronauts of being deprived of gravity and the geomagnetic field are almost immediate. Franz Anton Mesmer cast a long shadow with his intuition about the universal magnetic fluid.

Franz Anton Mesmer

Space precludes me from recounting the whole story of Franz Anton Mesmer. There were many controversies, and his methods incurred the ire of the established medical profession both in Vienna and in Paris. All I can do here is to give an overview of his theory and practice. The essential point to bear in mind is that Mesmer was an exceptionally charismatic human being. Dr. Wolfart, who edited and wrote a preface to

Mesmer's last work, said about him: "His marvelous skill in treating the sick by his penetrating gaze or merely by his raised hand inspired feelings of awe in the beholder" (Walmsley, 1967). Also the list of maladies that Mesmer was reputed to be curing is impressive, including dropsy, paralysis, gout, scurvy, blindness, and deafness (Fara, 2005).

It is 1784. You are in a dimly lit salon in a mansion in a prosperous section of Paris. The room is presided over by a tall, slightly overweight man dressed in a purple cloak trimmed with lace and embroidered with occult symbols. Other sigils decorate the walls and heavy velvet curtains over the windows, allowing just the odd ray of sunlight in to strike the thickly carpeted floor, and hardly a sound penetrates from the street outside. Melodious piano music can be heard softly from another room. You and a number of other Parisians are seated around a large, low tub, and there are other such tubs in the room, three for the rich and one for the poor. However, there are few poor people at their tub, since it is fashionable Paris that is fascinated by this new science. Movable iron rods stick out through the cover of the tub and have been bent at right angles, so that from where you sit on chairs around the tub you and others can hold the rods, or apply them directly or by means of an attached rope to an afflicted part of the body. The other end of these rods, you have been informed, are resting in phials of magnetized water, and these phials in turn stand in a pool of water containing magnetized iron filings. The wizard who is none other than Franz Anton Mesmer, calls this contraption a *baquet* (which just means 'tub'), and explains that it, or the attentions of an individual healer such as himself, can restore the lost balance of the magnetic fluid which pervades the universe and animates all living creatures, and whose disturbance is ill health. The group of clients grasp the rods and wait in silence. The atmosphere in the room grows very intense. Occasionally Mesmer or one of his assistants prowls around the room. To complete his appearance as a wizard, Mesmer carries a wand, with a metal tip. He inspects the woman next to you, passes his hands behind her back without touching her, points the wand at her, and she goes into convulsions. Her body begins to jerk, and her breathing is shallow and uneven; a flush comes over her face and neck. Finally she collapses gently to the floor, coughing up phlegm. Assistants calmly come and take her away to another room, which you can see is lined with mattresses and soft silk drapes. Mesmer follows to attend to her, now that she is on the road to health. (Waterfield, 2002)

Here's a 1779 account of Mesmer treating an army surgeon for kidney stones:

After several turns around the room, Mr. Mesmer unbuttoned the patient's shirt and, moving back somewhat, placed his finger against the part affected. My friend felt a tickling pain. Mr. Mesmer then moved his finger perpendicularly across his abdomen and chest, and the pain followed the finger exactly. He then asked the patient to extend his index finger and pointed his own finger toward it at a distance of three or four steps, whereupon my friend felt an electric tingling at the tip of his finger, which penetrated the whole finger toward the palm. Mesmer then seated him near the piano; he had hardly begun to play when my friend was affected emotionally, trembled, lost his breath, changed color, and felt pulled toward the floor. In this state of anxiety, Mr. Mesmer placed him on a couch so that he was in less danger of falling, and he brought in a maid who he said was antimagnetic. When her hand approached my friend's chest, everything stopped with lightning speed, and my colleague touched and examined his stomach with astonishment. The sharp pain had suddenly ceased. Mr. Mesmer told us that a dog or a cat would have stopped the pain as well as the maid did. (Liebermann, 2015)

Mesmer came to the conclusion that magnetism has a two-fold nature: the mineral magnetism present in metal, and the animal magnetism present in the human body. Some persons are endowed with unusual amounts of animal magnetism. This animal magnetism issues from their fingertips in such quantity that it can be sent as a healing force into afflicted parts of other human bodies (Jensen & Watkins, 1967). Mesmer made no further use of actual magnets from 1776 onwards and he stressed that the *baquet* which he used in his salon in Paris was just an accessory (Mesmer, 1779a; 1784).

In his *Dissertation on the Discovery of Animal Magnetism*, Mesmer makes it quite clear that his practices operate on the mental as well as the physical level: "Everything in nature communicates by a universal fluid. Nerves are the best conductors in the body for this universal magnetism and by touching these parts, you effect

a happy state of mind and bring on a radical cure” (Liebermann, 2015). “This implies that if a movement of the subtle substance is elicited within a body, there immediately occurs a similar movement in another body sensitive to receiving it, whatever the distance between the two bodies” (Mesmer, 1779b).

Mesmer composed a list of 27 propositions to explain his animal magnetism. He talked of a responsive influence between the heavenly bodies, the earth and all animated bodies, a subtle fluid universally diffused which underwent an ebb and flow and a reflux which was experienced by the animal body directly by its insinuation into the substance of the nerves. What follows are his propositions 9 and 10:

9. Properties are displayed, analogous to those of a magnet, particularly in the human body, in which diverse and opposite poles are likewise to be distinguished, and these may be communicated, altered, destroyed, and reinforced. Even the phenomenon of declination may be observed.

10. This property of the human body which renders it susceptible to the influence of the heavenly bodies, and of the reciprocal action of those which environ it, manifests its analogy with the magnet, and this has decided me to adopt the term of animal magnetism. (Jensen & Watkins, 1967)

King Louis XVI appointed a scientific committee to investigate animal magnetism. The committee ultimately published a report debunking the methods of Mesmer and other practitioners of animal magnetism as nothing more than the power of imagination. The American scientist and diplomat Benjamin Franklin was one of the Commissioners in the majority opinion. Franklin’s report condemned Mesmer not because his treatments failed to work, but because he had no physical explanation for their success, and he astutely observed: “Some think it will put an End to Mesmerism. But there is a wonderful deal of Credulity in the World, and Deceptions as absurd, have supported themselves for Ages” (Fara, 2005; Liebermann, 2015).

One of the Commissioners, Doctor Jussieu, published his own dissenting report:

...They have failed to make use of the positive results of magnetism... not investigated thoroughly... and I for one regret this negligence... because I am convinced that an insight into the force behind animal magnetism would be infinitely illuminating... The human body is subject to influences, like imagination, which must be from within or due to moral causes... others, such as rubbing or touch, must be external and physical. (Jensen & Watkins, 1967)

The psychiatrist and medical historian Henri Ellenberg considers Mesmer the very first *psychodynamic* psychiatrist, a physician who conceptualizes mental illness as resulting from inner psychic processes (Liebermann, 2015).

The Spin-offs of Animal Magnetism

Stefan Zweig in his book *Mental Healers* sums up the conventional, or shall we say the modern view, of where Franz Anton Mesmer stands in the history of mental or spiritual healing (Zweig, 1933).

It is always an intellectual tragedy when a discovery is more brilliant than its discoverer, when the thought of an artist or a scientific investigator is incomprehensible to the thinker so that he gives it forth to the world inchoate. That was what happened in Mesmer’s case. He was the first to moot one of the most important problems of modern times, and had advanced a considerable way towards its solution, but after all the problem was too big for him. He had thrust a question upon the world, a question to which he himself had vainly sought an answer. Yet though in the end he strayed from the path, he was none the less a forerunner, a pathfinder, a trail-breaker; for assuredly it is undeniable that all the psychotherapeutic methods of today derive by one route or another from the discoveries of Franz Anton Mesmer, who not only, as a pioneer, happened upon the recognition of the power of what we now call suggestion, but, however crudely and however mistakenly, maintained the practice of the first scientific method of mental healing against the laughter, the scorn, and the contempt of an unduly mechanical science. These facts suffice to give him a place in history.

Interestingly the other two mental healers that Zweig deals with in his book are Sigmund Freud and Mary Baker Eddy, both of whom are strictly speaking spin-offs of animal magnetism. The other interesting thing in Zweig's obituary of Mesmer is that there is no specific mention of animal magnetism as such. Mesmer's legacy is explained strictly as "the power of what we now call suggestion". When reading this obituary of Mesmer please bear in mind that recent research has shown that Mesmer was not wrong nor was he misguided. There really is such a thing as "animal magnetism" and there really is such a thing as a "magnetic fluid" in our bodies, and it is no longer necessary to justify or rationalize mesmerism by saying that although he was mistaken in the main thrust of his thesis he managed to introduce to the world the power of suggestion as an effective means of healing many mental illnesses. The fact is that he was making physical bodily changes in his patients through animal magnetism as well as effectively tapping into this "power or suggestion" procedure. At no stage was Mesmer wrong, but his animal magnetism theory was merely the tip of the iceberg of a way of viewing the world and humankind's position in it as a means of healing some of our woes that has spread into numerous "isms" such as romanticism, spiritualism, hypnotism, naturalism, evangelism and has wrought profound changes in established religion and the religious sentiment in general.

Even in Mesmer's own time there came into being two schools of thought: that of the "fluidists" and that of the "animists" (Zweig, 1933). The chief exponent for the "fluidists" was Deleuse who remained faithful to Mesmer's own view "that what was operative was a physical substance, the subtilization of some sort of bodily nerve-stuff; he believed (like the spiritualists with their telekinesis and another group of investigators with their doctrine of odic force) that there was a material projection through space of the organic substance of the magnetizer" (Zweig, 1933) The most notable animist was Chevalier Barbarin who denied any material emanation from the magnetizer, and saw the healing properties as being purely the mental effect of the magnetizer's will (Zweig, 1933). For the past 250 years the animists have been in the ascendancy, and it is only recent research that has revealed that they were both right.

Hypnotism

Hypnotism as we know it today really started at the height of the controversy over Mesmer's cures with the publication in 1784 by de Puységur, one of Mesmer's pupils and a member of Mesmer's Society of Universal Harmony, of a *Rapport des cures opérées à Bayonne par le magnétisme animal*. Although he was still calling it animal magnetism he was able to demonstrate that a state similar to somnambulism (sleep walking) can be artificially induced, which he called magnetic sleep. In particular he reported his experience with a shepherd lad, called Victor, who did not respond to magnetic manipulations in the customary way of the Mesmer experience, but instead went off into a peaceful slumber beneath the magnetizer's gently stroking fingers (Zweig, 1933). Although de Puységur was not able to arouse Victor from his slumber, he found that he obeyed when ordered to stand up, and he answered questions put to him by Puységur as if he were in a dream state. After his experience with Victor, de Puységur went on to find that he was able to put many people into this limbo state between dreaming and waking with this magnetic (suggestive) treatment (Zweig, 1933).

Of special interest is the fact that de Puységur was able to establish such a good rapport with his favorite somnambulist, a young woman called Madeleine, that he could get her to do something just by willing it. Just as it is will that makes me raise my hand when I want to, so the magnetized subject is like a limb or extension of the operator. Madeleine would fetch an object on an unspoken willed command (Waterfield, 2002). There can be only one explanation for this: the brainwaves of the patient are entrained by those of the magnetizer.

Again, with Victor, de Puységur established what we would now call telepathy. He found that he could will Victor to go to sleep, from some distance away and without saying a thing, and Victor would fall asleep (Waterfield, 2002). De Puységur did not call it “telepathy” however, he attributed it to the transference of magnetic fluid, bearing the magnetizer’s will and thoughts, from the magnetizer to the subject, a perfectly reasonable explanation if we assume the “magnetic fluid” is in fact brainwaves aka electromagnetic waves. De Puységur coined the phrase “Believe and Will” as the true principle of animal magnetism (Waterfield, 2002).

This is not the place to review the whole history of hypnotism, but it will be instructive to review a modern text on hypnotism to see how much of Mesmer’s original theory is still currently relevant. Mesmer himself did not realize the effect of his stroking and fixing of the patients that had produced. He had frequently observed that under his manipulation certain patients would get heavy-eyed, would yawn, and would appear to go to sleep, that their lids would quiver and close (Zweig, 1933). There is an eye-witness account by Jussieu of one such case. He tells us that a patient suddenly rose up with eyes fast closed, walked over to where other sufferers sat, magnetized them, and then, still with closed lids, returned to his place, and sat down quietly, without in any way becoming aware of his own activity—a dream-walker in full daylight (Zweig, 1933).

The modern definition of hypnosis is very broad and general, and there cannot be any doubt that Mesmer’s patients would be included.

For as long as your attention is directed in an absorbing way either inwardly on some subjective experience, or outwardly on some external stimulus (which, in turn creates an internal experience), and you are responsive to suggestions to alter your experience in some way, you can reasonably said to be in hypnosis. (Yapko, 2003)

In his book *Trancework: An Introduction to the Practice of Clinical Hypnosis*, Michael Yapko tells us right up front that it is inevitable that the hypnotist will have influence over the patient.

It is an important starting point in studying hypnosis to recognize the ever-present nature of interpersonal influence. In studying the fascinating realm of social psychology in particular, you learn almost right away that influence is inevitable *simply by your being there...* The mere presence of another person alters your behavior. It is not a question of whether you will influence your client – you undoubtedly will – but rather a question of *how* you will influence him or her. (Yapko, 2003)

Communication to absorb and occupy the client’s conscious mind is the starting point in the hypnotic interaction: such communication is called “induction” (Yapko, 2003). It is also important to bear in mind that when you focus on something, you amplify it in your awareness (Yapko, 2003). Generally we are told that the foundation of the hypnotic experience involves the focusing of the patient’s attention on a specific stimulus (usually your words or your gestures) to the near-exclusion of other ongoing stimuli (Yapko, 2003). In Mesmer’s case the specific stimuli were his words, his magnetic apparatus, the passes with his hands, his magnetic wand, etc. A séance with Mesmer presiding may be considered a global stimulus upon which the patient’s attention was focused, and in which the patient was fully absorbed. The literature in hypnosis and psychotherapy generally employs the word “rapport” to describe the ideal positive interrelationship between hypnotist/clinician and client (Yapko, 2003). Deleuze in his influential *L’Histoire critique du magnétisme* tells us that this notion of being *en rapport* with the patient dates back to Mesmer himself (Bersot, 1853).

Once the hypnotist has established this rapport with the patient, this normally becomes the patient’s first “official” hypnotic experience. Use of the experience as a foundation for future similar experiences starts to condition the patient to the experience of entering hypnosis while having his or her experience guided by the

clinician. Thus, the patient has an opportunity to build rapport in the relationship with the clinician, begins to build trust in the clinician, and begins to build confidence in his or her own ability to experience hypnosis (Yapko, 2003). This explains the apparent ease with which Mesmer could make his long term patients respond to his procedures, and about which the investigative Commissions were highly skeptical.

According to Milton H. Erickson on engendering confident expectations in the client which of course was something that Mesmer was masterful at doing:

Every effort should be made to make the subjects feel comfortable, satisfied and confident about their ability to go into a trance, and the hypnotist should maintain an attitude of unshaken and contagious confidence in the subject's ability. A simple, earnest, confident manner is of paramount importance. (Yapko, 2003)

Another celebrated hypnotist, Paul Watzlawick, Ph.D., stresses the need to communicate with the unconscious mind of the client in order to be as influential as possible in therapeutically altering his or her experience. Here again it may be assumed that the mood and atmosphere of Mesmer's salons, as well as the elaborate apparatus he used, and also the general social ambiance were all calculated to address his patients subliminally. In Mesmer's time the unconscious mind had not even been formally proposed, but we may assume that he knew instinctively how best to draw his clients into his sphere of influence; some would even suggest putting his clients "under his spell".

Above all modern hypnosis stresses the need for the hypnotist to establish sufficient rapport with and responsiveness in the client. Josephine Hilgard, Ph.D., asserts that hypnotizability was best predicted by the capacity for imaginative involvement, which she defined as the capacity for nearly total immersion in some activity to the exclusion of irrelevant competing stimuli (Yapko, 2003). Interestingly the Commissions that were set up to investigate Mesmer gave as their primary reason for denouncing him as a charlatan that he was merely appealing to the imagination of his patients; the animal magnetism part of his theory, and in particular the "magnetic fluid" had no physical reality notwithstanding that his patients were able to respond to it imaginatively. Not only do high hypnotizables have this capacity for "imaginative involvement" but they are also said to be "fantasy-prone" (Yapko, 2003).

Another negative finding made by the Commissions was that most of Mesmer's patients were women. His techniques mainly work on women because they are weak minded and more prone to flights of imagination especially when the suggestions are coming from a man. The modern attitude in the professional community concerning gender differences in hypnotizability is summarized as follows:

(The difference) between men and women has been equivocal. That is, in general there has been a consistent small difference found favoring women over men, but never at even the level of 5% significance. This has led past researchers to reject the existence of a difference... The difference is much too small to be of practical importance or to indicate something that would be theoretically important. (Yapko, 2003)

If most of Mesmer's patients were women, and given the fact that women are slightly more prone to hypnosis than men, then it's reasonable to assume that much of Mesmer's success was indeed due to his ability to hypnotize his patients, rather than working on their animal magnetism and harmonizing their magnetic fluid as he thought.

It seems that the power of suggestion can even modulate color perception in hypnotized patients, that is to say, can actually alter the neural processes in the brain. Subjects chosen for their high hypnotizability were shown a series of patterns some involving colors and some only shades of gray while in waking and hypnotized

conditions. PET scan technology shows that color stimulus is processed in a separate region of the brain than gray stimuli. Researchers then suggested that the subjects visualize each image shown them as either color or black and white while the PET scan measured brain activity. When subjects were hypnotized, the color areas of the brain were less active when told to see color as only gray, and likewise, the color areas of the brain were more active when told to see (i.e. hallucinate) the gray stimulus as colorful (Yapko, 2003). We are also told that rapid eye movements under the eyelid are observable throughout much of the hypnosis session, even more so if the process involves a lot of suggestions for visualization (Yapko, 2003).

In modern hypnotism there is such a thing as “spontaneous regression and abreaction”, which is reminiscent of Mesmer’s practice of deliberately provoking a crisis in the patient as a means of starting his treatment process. And we have also seen that not all of Mesmer’s patients had an abreaction or crisis, many of them actually became more docile and compliant. Michael Yapko (2003) states:

The topic of this section [spontaneous regression and abreaction] represents the most common hazard of doing hypnotism, and it isn’t a question of *whether* you will encounter it, but *when*. If you have been practicing your skills in hypnosis with different people, then you probably have had the experience of discovering that people respond in unexpected and even unusual ways to the most straightforward, seemingly one-dimensional hypnotic suggestions. The fact that people will interpret what you say from their own frame of reference, and will therefore associate meanings to what you say that you never intended, is a given in doing clinical analysis.

According to Michael Yapko, some clinicians actually instigate abreactions in their clients in order to deliberately bring painful memories up and attempt to resolve them therapeutically. This can be an invaluable treatment strategy if done skillfully. If done poorly, it can place the already vulnerable client in greater emotional distress, not to mention wasting an opportunity to do some real healing (Yapko, 2003). Abreactions can manifest themselves in a variety of ways, including crying, hyperventilation, trembling of the body (or specific parts), premature disengagement from hypnosis, hallucinations, delusions, and autistic-like rocking motions (Yapko, 2003).

Psychoanalysis

Mesmer is given credit for initiating a method of mental healing which culminated in the theories of Sigmund Freud. Freud initially became interested in hypnosis, especially the mysterious phenomenon whereby patients accessed memories that they could not recall during their normal state of awareness. This observation eventually led him to his celebrated theory of the unconscious mind: that our minds contain a hidden form of awareness that is inaccessible to our waking consciousness (Liebermann, 2015). Freud developed his own techniques, generally known as the “talking cure”, which was different again from the techniques used by Mesmer and the later hypnotists, in order to tap into this unconscious part of the mind.

Interestingly a disciple of Freud’s, Dr. Wilhelm Reich, developed a theory that was practically identical with Mesmer’s own theory, the Orgone Theory, a term derived from the words “organism” and “orgasm”, which was branded a “fraud of the first magnitude” by the FDA in about 1947 (Liebermann, 2015). Physical and mental health depended on a hidden form of energy uniting all nature’s elements. Reich set up the Orgone Institute, and he used an “orgonoscope,” an instrument that resembled a small brass telescope, to view the flow of orgone in the body. He developed apparatus similar to Mesmer’s *baquet* which would properly configure and restore the natural flow of orgones within the body. From the point of view of the medical profession Reich was a charlatan, but there can’t be any doubt that his methods would appeal to the “imagination” of his patients,

and he would have affected many cures thru the “power of suggestion”. The mistake that Reich made was he was actually selling his orgone energy devices to his patients, which resulted in a lot of customer dissatisfaction.

Spiritualism, Christian Science, New Thought, Theosophy, New Age Healing, etc.

Disciples and followers of mesmerism adapted parts of his theory in hundreds of different movements mainly of the mind-body healing type and the spiritual healing type, as well as combining with Swedenborgianism to pursue mysticism, spiritualism and even to found new religions. In the introduction to the book *Swedenborg, Mesmer and the Mind/Body Connection: The Roots of Complementary Medicine* we can get some idea of the vast scope of Mesmer’s legacy.

This book traces the interconnection between the physical and cosmic realms as expressed by the advocates of mesmerism and Swedenborgianism—those who aligned healing (which I define in the broadest sense of the term) with the currents of providential laws and purposes, and those who envisioned a less spiritual but nonetheless subtle form of interaction between the cosmos and the individual's own mental powers.

The meditative worldview that today challenges the prevailing dominance of Western reductionist thinking took wing with two earlier movements—mesmerism and Swedenborgianism—that coursed through the nineteenth century as host companions to eclecticism, phrenology, Spiritualism, mind cure, Christian Science, homeopathy, transcendentalism, New Thought, and Theosophy, and then into the twentieth and twenty-first centuries under the name of osteopathy, chiropractic, anthroposophy, holistic health, positive thinking, and New Age healing. They even helped formulate the spiritualist backbone of America's perfectionist and communitarian traditions. In both these host movements, objective truth was replaced by a subjectivity or experiential knowledge that included altered states of consciousness. (Haller, 2010)

Biomagnetism and Biophysics

Biophysics is a vast interdisciplinary branch of science generally involved with applying the principles of physics (electromagnetism, bioelectronics, nanotechnology, and quantum mechanics) to the study of our biological and cellular structure.

Biomagnetism is a subset of bioelectromagnetism which investigates the phenomenon of magnetic fields produced by living organisms. Officially magnetobiology is the name given to the study of the effects of magnetic fields on organisms, although the word biomagnetism is often loosely used as well. Indeed the word biomagnetism seems to encompass any and all combinations of the words magnetism, cosmology, and biology, such as “magnetoastrobiology”. If Mesmer was alive and practicing today he would be a magnetoastrobiophysicist. (According to the explanation of Biomagnetism in Wikipedia)

All of the above is considered mainstream scientific endeavor, and in addition today there remain fringe practitioners of animal magnetism which Mesmer himself would not have approved of, inasmuch as he was convinced that the magnets were just an artifice and the true source of animal magnetism was in his own body. For instance there is “biomagnetic therapy, also called biomagnetic pair or terrain restoration therapy, a natural and safe therapy that re-establishes normal cellular milieu through the use of pairs of magnets of medium intensity. The goal is to equalize the organism’s pH level—a critical detriment to health” . This has been called “pseudoscientific twaddle”, but as we will see in the last part of this paper it is now known that magnetic fields really can have an impact on the ferritin in our bodies by making it paramagnetic, which would seem to vindicate biomagnetic therapy as well.

In France, as recently as the 1970s there occurred a case reminiscent of the controversy surrounding Mesmer himself, and likewise has to be reconsidered in the light of this new research. This was The Great

Bordeaux Magnetic Machine Mystery, or “L’Affaire Priore”. A machine built at the University of Bordeaux by Antoine Priore, a 62-year old electrical engineer, was claimed to absorb cancerous tissue, to make leukemia go into regression, to eradicate, and afterwards make the affected animal immune to, the parasite (*Trypanosoma equiperdum*) which causes sleeping sickness and death, and cure rabbits which have been inoculated with trypanosomes which causes them to become terminally ill. Interestingly a twenty-man commission composed of well-known men of science was set up to investigate Priore’s claims. They apparently were satisfied with the experimental findings, but could not come up with an explanation of the workings of the Priore equipment (Battocletti, 1976).

All I can do here is to present a broad sampling of research indicating that magnetic fields can be used for healing purposes and/or affect bodily processes. It has been reported that the first stages of hypertension were relieved by the application of a magnetic bracelet. However, advanced stages were affected only slightly (Battocletti, 1976). The application of a magnetic field to the back of the head thirty minutes before sleep relieved headaches (Battocletti, 1976). A magnetic field can make symptoms of nervous and vascular diseases disappear or become less noticeable (Battocletti, 1976).

I now present the concluding remarks in a paper entitled *Effects on the Central Nervous System* (Barnothy, 1964).

Consequently, it may be assumed that a static magnetic field exerts direct nonspecific action on the central nervous system of vertebrates. This assumption does not exclude the possibility of a reflexive effect due to magnetic fields, which is confirmed by experiments with isolated organs and tissues.

In summary, we point out several peculiar features of the physiological action of a static magnetic field as a stimulus.

1. A magnetic field is a weak stimulus. The reaction to this stimulus takes place approximately in 40% to 70% of all cases when a magnetic field is applied.
2. A magnetic field produced predominately an inhibitory effect.
3. A reaction to a magnetic field sometimes persists even after the latter is discontinued.
4. A static magnetic field acts directly on the structures of the diencephalon and forebrain.

Studies have also been made on the effect of an applied magnetic field on the activation of enzymes. In a paper entitled *Increase of Trypsin Activity* (trypsin is an enzyme produced in the pancreas that can be deactivated by ultraviolet light), it was found that exposure of trypsin to a magnetic field resulted in a decrease of ultraviolet light absorption. It was also found that exposure of inactivated trypsin to a magnetic field did not result in a reactivation of the enzyme. However in a subsequent paper entitled *Magnetic Reactivation of Partially inhibited Trypsin* it was found that trypsin that is inactivated by means other than ultraviolet light, such as egg-white trypsin inhibitor, can be reactivated by exposure to a magnetic field (Barnothy, 1964).

Mesmerism Today

Animal magnetism as practiced by Mesmer is very much still alive and well today. For instance there is a New Society for Universal Harmony in Athol Springs, New York State, which is run by a Dr. F. A. Mesmer (Malen, 2005). This is her adopted name. She was formerly a scientist working on magnetohydrodynamics and she came to Athol Springs and founded her New Society for Universal Harmony about the year 2000. She teaches, similar to the original Mesmer, that magnetic forces surround us. They emanate from the sun and the moon and from the earth’s core. The magnetic reconnection is the breaking and rearrangement of magnetic field lines in plasma. The solar flares are composed of plasma. The earth’s own magnetic field is constantly

perturbed by the impinging fields from the sun. This is the solar wind. Franz Anton Mesmer's imponderable magnetic fluid is now identified as electromagnetic fields or waves, although they still use the word "fluids" which now extends to fields and waves (Malen, 2005). She quotes the original Franz Anton Mesmer on psychic phenomena: "We can thus comprehend how the wills of two persons can communicate with each other through their internal sense organs, an accord, a sort of covenant between two wills, which we can call 'being in rapport'" (Malen, 2005).

The New Society fosters spirit photography based on MRI (Magnetic Resonance Imagery) scans. The proceedings of the New Society explain: The principle behind nuclear magnetic resonance was discovered in 1946. No matter how thin you are, your body is predominantly composed of fat and water. Both substances are rich in hydrogen atoms. The nucleus of each hydrogen atom contains a single proton that spins, creating a tiny magnetic field that emits a nuclear magnetic resonance. Mysterious human figures and faces have been identified in some of these fMRI scans which "suggests that Mesmer's connection of magnetic forces to the force of 'animal magnetism' and personality deserves continued research employing the new, wider-seeing technologies" (Malen, 2005).

As a general overview we are told: "Restoring a more accurate understanding of the therapeutic process, the New Society for Universal Harmony directly addresses the problem of magnetic flows within the patient. Instead of relying on the indirect methods of Freudian analysis, the doctors of the society have gone back to the *baquet* and other instruments invented by Mesmer, intervening to restore the balance of magnetic fluids and the patient's sensation of well-being" (Malen, 2005).

Another organization keeping Mesmer's original animal magnetism alive is The International Research and Development Magnetic Health Products Organization, in Bentleigh, Australia. This organization has produced *The Book of Magnetic Healing and Treatments* (Norris, 1995). We have seen that Mesmer claimed to be able to magnetize water, and I present what is said in this book of magnetic treatments about "magnetic water":

The term magnetic water is actually a misnomer, as water does not become magnetized in the scientific sense. By introducing water to a magnetic field, we ionize the water by creating positive or negative ions. An ion is an atom of any element which has gained or lost electrons. South Pole ionized water makes an excellent tonic water for maintenance of good health and where hyper conditions are indicated. North pole water is only recommended for hypo conditions and should be used for a limited period. Effective north pole or south pole water is made by standing a glass bottle on a high powered treatment magnet, preferably overnight. Dual pole (bi-polar) water is sometimes made by using a mug containing both north and south pole magnets and will act the same way on the body as north pole water. (Norris, 1995)

Brain Waves

In modern hypnosis there are many theorists who have suggested that it is best understood as a neurological or psychobiological phenomenon (Yapko, 2003). The psychologist Ernest Rossi, Ph.D., proposed that hypnosis was a natural part of the body's regularly alternating cycles of attentiveness and relaxation called "ultradian rhythms" that occur every 90-150 minutes (Yapko, 2003).

EEG Frequency Analysis today tends to focus on the issue of band frequencies associated with hypnosis, specifically the question of whether one band frequency, such as alpha or theta, is most representative of the hypnotized brain. Early studies in this area suggested that hypnosis is an "alpha state". This notion was widely popularized, even leading to "higher consciousness" workshops on learning to generate alpha rhythms and the creation of special "alpha wave synchronizing" machines made commercially available to help you do so.

However, hypnosis is not simply an “alpha state”. The research on alpha waves as an indicator of hypnosis is quite ambiguous, but some research regarding alpha waves suggests they may indeed have some relationship to hypnotic susceptibility either before or during hypnosis (Yapko, 2003).

Studies of EEG brain-wave activity tend to show that the theta band is associated with higher levels of hypnotic susceptibility both in eyes-open and eyes-closed pre-hypnosis baselines and also during the induction of hypnosis. Theta is also associated with focused attention, clearly a necessary component of the hypnotic experience. Thus, as individuals enter hypnosis, EEG theta power tends to increase. This increase may be observed in low hypnotizables as well as highs, but is more pronounced in highs (Yapko, 2003).

It is generally accepted that some therapists have the ability of “being hypnotic” which actually enables them to modulate or influence these slow-wave theta oscillations. This can be done by their ability to develop and enhance rapport, the timing and phrasing of language, and environmental factors (music in the waiting area, calming versus chaotic clinic environment) all of which can influence oscillation patterns, and therefore clinical responsiveness (Yapko, 2003; Jensen, Adachi, & Hakimian, 2015). Nobody doubts that Mesmer himself must have had this ability of “being hypnotic”. There are a number of other strategies that have been shown to increase theta activity, such as music or monochrome sounds, some meditation training practices, and neurofeedback (explained below) (Jensen et al., 2015).

There is another EEG “marker” that seems to occur in hypnotism. It is the so-called “40 Hertz band”. The 40 Hertz band is a high frequency, low amplitude EEG rhythm that centers around 40 Hertz that is associated with the condition of focused attentional arousal. It has been reported that high hypnotizables showed greater 40 Hertz production in their right hemispheres during hypnosis, while low hypnotizables showed reduced activity in both brain hemispheres. We are told that high hypnotizables, compared to lows, both in waking and hypnosis conditions, have a greater capacity to access both positive and negative life-emotional experiences, a capacity associated to task-related hemispheric shifts of fast EEG activity in the 40 Hertz band. It seems that the 40 Hertz band is the physiological marker of focused arousal (Yapko, 2003). This 40 Hz band, aka “38.00-42.00 Hz gamma” is said to be associated with the theta band in hypnotized subjects, but the association between the gamma waves and the slow-wave theta band is not well understood (Jensen et al., 2015).

There is a theory that much of neuropathology can be attributed to problems in brain timing, specifically the patient’s brain waves being “off”. This “neurofeedback” or “EEG feedback” can show disruptions in brain self-regulation called dysrhythmias. These self-regulatory deficits are said to be responsible for various arousal disorders (e.g. anxiety), attention disorders, mood disorders, seizure disorder, and specific learning deficits (Yapko, 2003). Neurofeedback involves brain exercises that are directed at teaching the individual to self-correct their brain wave patterns. The presumption is that if you correct the brain, the patient’s problems may correct as well (Yapko, 2003). Arguably this is what occurs when a healer’s or hypnotist’s brain waves become synchronized with the patient (Fahrion, Wirkus, & Pooley, 1992; Cade & Coxhead, 1996). Indeed it has now been established that the rhythms of brainwaves between two people simply taking part in a conversation begin to match each other (Pérez, Carreiras, & Duñabeitia, 2017). Also massage and simple touching and indeed even taking a placebo have effects on the EEG and the state of mind (Diego, Field, Sanders, & Hernandez-Reif, 2004; Mohr, Kirsch, & Fotopoulou, 2017; Klein, 2017).

In fact there is a strategy to manipulate brain wave patterns for the purpose of improving both hypnotizability and clinical symptom presentation, called EEG entrainment, which is exactly what is said to happen when a healer focuses on a patient. EEG entrainment involves the use of a stimulus, binaural-beat

sound stimulation, to drive the brain. This is one of several brainwave changing processes, which may also include breathing exercises, guided relaxation, and imagery processes. A binaural beat takes place when two different sound waveforms are presented stereophonically through headphones to a subject who will have the subjective perception of a third “beat” frequency occurring due to the difference between the two sound waves. The effects of listening to the binaural beats may be subjectively experienced as relaxing or stimulating, depending on the frequencies used. It has been found to increase theta activity in the patient, as well as increase hypnotic susceptibility in the low and medium-susceptible groups (Yapko, 2003). Obviously Mesmer never used anything as sophisticated as this, still it is well known that he played music in his salons which was calculated to set the mood for the séance.

Latest Research in Radiogenetics

Magnetic biopsies have been conducted for decades which in principle have been able to count the number of ferritin atoms in the liver for example, but there are a number of difficulties with the procedure and it has been found normally to be only effective in diagnosing an iron overload, not an iron deficiency (Williamson, Romani, Kaufman, & Modena, 1983). I mention this merely to demonstrate that scientists have known all along that ferritin in the body is a paramagnetic material and therefore has a magnetic susceptibility. This fact alone vindicates Mesmer’s animal magnetism.

In 2014, a research paper was published in *Nature Genetics* which launched a new direction in optogenetics which is known as radiogenetics (Stanley, Sauer, Kane, Dordick, & Friedman, 2014). Radiogenetics will make it possible to remotely control biological targets in living animals without wires, implants, or drugs. A research team at Rockefeller University used electromagnetic waves to turn on insulin production to lower blood sugar in diabetic mice. A naturally occurring iron storage particle in the body, ferritin, when exposed to a radiowave or a magnetic field can activate an ion channel called TRPVI which in turn leads to the activation of an insulin producing gene. These two proteins, ferritin, and TRPVI acting together as a nano-machine can be used to trigger gene expression *in vivo*. And it is all done by radiowaves.

“The method allows one to wirelessly control the expression of genes in a living animal and could potentially be used for conditions like hemophilia to control the production of a missing protein. Two key attributes are that the system is genetically encoded and can activate cells remotely and quickly,” says Jeffrey Friedman, Marilyn M. Simpson Professor, head of the Laboratory of Molecular Genetics at Rockefeller University. “We are now exploring whether the method can also be used to control neural activity as a means for noninvasively modulating the activity of neural circuits” (News Wire, 2014).

Radiogenetics is being heralded as being more effective than other systems in optogenetics that simply use light as the on/off switch, which tend to be only effective near the skin and require permanent implants. Originally the researchers used low-frequency radio waves which heat or move the ferritin particles and the TRPVI which is situated in the membrane surrounding the cell opens up a channel allowing calcium ions to flow through and activate a piece of synthetic DNA implanted upstream to the gene they want to turn on. In this case, it was the gene that synthesizes the protein insulin, but it seems that in this way they can activate any gene of interest (News Wire, 2014).

Interestingly the researchers were able to achieve the same result by manipulating the ferritin with a magnetic field, which recalls the theories of Franz Mesmer in the 18th century about animal magnetism and the magnetic cure (Mesmer, 1775). It could well be the case that a hypnotist is able to channel his/her brain waves

which are ELF radio waves to manipulate the ferritin in the cells and genes of his/her subjects. Mesmer himself stated that the magnets were immaterial to his treatment and what was essential was his state of mind towards the patient. He was willing the patient to be healed (Mesmer, 2016) and it is well settled that the brainwaves (ELF radiowaves) of healer and patient become synchronized (Fahrion et al., 1992; Cade & Coxhead, 1996).

“The use of a radiofrequency-driven magnetic field is a big advance in remote gene expression because it is non-invasive and easily adaptable,” says Johnathan Dordick, who is Howard P. Isermann, professor of Chemical and Biological Engineering and vice president of research at Rensselaer Polytechnic Institute.

You don’t have to insert anything—no wires, no light systems—the genes are introduced through gene therapy. You could have a wearable device that provides a magnetic field to certain parts of the body and it might be used therapeutically for many diseases, including neurodegenerative diseases. It’s limitless at this point (News Wire, 2014).

“In this current study, we’ve shown that by opening the TRPV1 channel to allow calcium ions to enter the cell, we can turn on a gene. Since neurons can be depolarized by calcium and other positively charged ions, such as those the TRPV1 channel controls, we hope that this system may be effective at regulating neural activity,” says co-first author Sarah Stanley, a senior research associate in Friedman’s lab (News Wire, 2014).

Conclusion

This article does not claim that Franz Anton Mesmer invented animal magnetism, and if he had not lived, then all the modern practices of mental and spiritual healing as well as hypnotism, psychology, and psychiatry would not have occurred, because quite clearly all these practices and disciplines are the essence of the human condition, and if Franz Anton Mesmer had not started the ball rolling, then some other historical persons would have. This article attempts to address the fact that the historical person Franz Anton Mesmer was the genius who started the ball rolling, and for that reason alone his name deserves to appear in lights in the history of human civilization. The name Franz Anton Mesmer should have top billing.

References

- Barnothy, M. F. (Ed.). (1964). *Biological effects of magnetic fields*. New York: Plenum Press.
- Battocletti, J. H. (1976). *Electromagnetism, man and the environment*. Boulder, CO: Westview Press.
- Bersot, E. (1853). *Mesmer et le magnétisme animal*. Librairie de L. Hachette et Cie, Paris.
- Bersot, E. (1853). *Mesmer et le magnétisme animal*. Paris Librairie de L. Hachette et Cie.
- Cade, M., & Coxhead, N. (1996). *The awakened mind: Biofeedback and the development of higher states of awareness*. London: Element Books Reprint.
- Diego, M. A., Field, T., Sanders, C., & Hernandez-Reif, M. (2004). Massage therapy of moderate and light pressure and vibrator effects on EEG and heart rate. *International Journal of Neuroscience*, 114, 31-45.
- Dubrov, A. P. (1978). *The geomagnetic field and life*. New York: Plenum Press.
- Fahrion, S., Wirkus, M., & Pooley, P. (1992). EEG amplitude, brain mapping, & synchrony in & between a bioenergy practitioner & client during healing. *Subtle Energies & Energy Medicine*, 3(1). Retrieved from <http://journals.sfu.ca/seemj/index.php/seemj/article/view/144>.
- Fara, P. (2005). *Fatal attraction: Magnetic mysteries of the enlightenment*. London: Icon Books.
- Haller, J. S. (2010). *Swedenborg, Mesmer, and the mind/body connection: The roots of complementary medicine*. West Chester, PA: Swedenborg Foundation.
- Jensen, A., & Watkins, M. L. (1967). *Franz Anton Mesmer: Physician extraordinaire*. New York: Garrett Publications.
- Jensen, M. P., Adachi, T., & Hakimian, S. (2015). Brain oscillations, hypnosis, and hypnotizability. *American Journal of Clinical Hypnosis*, 57(3), 230-253.
- Klein, A. (2017). Want to think outside the box? Try sniffing a placebo. *New Scientist*, 27 October 2017.

- Liebermann, J. A. (2015). *Shrinks: The untold story of psychiatry*. New York: Little Brown & Company.
- Malen, L. (2005). *The new society for universal harmony*. New York: Granary Books.
- Mesmer, F. A. (1766). On the influence of the planets. In G. Bloch (Ed.), *Mesmerism: A translation of the original scientific and medical writings of F. A. Mesmer*. Los Altos, CA: William Kaufmann, Inc.
- Mesmer, F. A. (1779a). Dissertation on the discovery of animal magnetism. In G. Bloch (Ed.), *Mesmerism: A translation of the original scientific and medical writings of F. A. Mesmer*. Los Altos, CA: William Kaufmann, Inc.
- Mesmer, F. A. (1779b). Dissertation by F. A. Mesmer, doctor of medicine, on his discoveries. In G. Bloch (Ed.), *Mesmerism: A translation of the original scientific and medical writings of F. A. Mesmer*. Los Altos, CA: William Kaufmann, Inc.
- Mesmer, F. A. (1784). Catechism on animal magnetism. In G. Bloch (ed.), *Mesmerism: A translation of the original scientific and medical writings of F.A. Mesmer*. Los Altos, CA: William Kaufmann, Inc.
- Mohr, M. V, Kirsch, L. P., & Fotopoulou, A. (2017). The soothing function of touch: Affective touch reduces feelings of social exclusion. *Scientific Reports*, 7, Article number 13516.
- News Wire. 2014. Retrieved from <http://newswire.rockefeller.edu/2014/12/15/radiogenetics-seeks-to-remotely-control-cells-and-genes/>.
- Norris, N. C. (1995). *The book of magnetic healing and treatments*. Bentleigh, Australia: The International Research and Development Magnetic Health Products Organization.
- Pérez, A., Carreiras, M., & Duñabeitia, J. A. (2017). Brain-to-brain entrainment: EEG interbrain synchronization while speaking and listening. *Scientific Reports*, 7(1).
- Stanley, S. A., Sauer, J., Kane, R. S., Dordick, J. S., & Friedman, J. M. (2014). Remote regulation of glucose homeostasis using genetically encoded nanoparticles. *Nature Medicine*, 21, 92-98.
- Walmsley, D. M. (1967). *Anton Mesmer*. London: Robert Hale.
- Waterfield, R. (2002). *Hidden depths: The story of hypnosis*. New York: Macmillan.
- Williamson, S. J., Romani, G. L., Kaufman, L., & Modena, I. (Eds.). (1983). *Biomagnetism, NATO ASI series; series A: Life sciences* (Vol. 66). New York: Plenum Press.
- Yapko, M. D. (2003). *Trancework: An introduction to the practice of clinical hypnosis* (3rd ed.). New York: Brunner-Routledge.
- Zweig, S. (1933). *Mental healers*. London: Cassell and Co.