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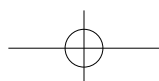
Matsumoto Chiwaki's Theory of Human Radioactivity: A Case of Reception of Western European Science in Japan¹

As modern European and American scientific thought was being introduced in nineteenth-century Japan, Japanese intellectuals simultaneously adopted concepts that had already lost their legitimacy in Western scholarly circles (such as “imponderable fluids”) and recent discoveries that were about to revolutionize science (such as radioactivity), leading to the invention of new concepts that combined both local and translocal scientific and occult ideas. This paper presents such a case by describing the “discovery” by Matsumoto Chiwaki, a *reijutsuka* active at the fringes of Japanese academia, of “human radioactivity”: the idea that humans have the capacity to emit radioactivity that affects objects and human bodies, with the ultimate objective of curing diseases.

Keywords: Matsumoto Chiwaki – human radioactivity – imponderable fluids – mesmerism – occult science

This paper is an examination of certain views of anatomy and nature from the Meiji era to the early Showa era, focusing on the scientific concepts of “radioactivity” and “imponderable fluids.” This case reveals a distinctive and unusual culture of thought that was associated with the reception of Western scientific thinking in modern Japan, especially as it was expressed by Matsumoto Chiwaki 松本道別 (1872–1942), a *reijutsuka* 霊術家² who worked at the periphery of the academism of Japanese imperial universities.

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1. This paper is a translation of Okumura Daisuke 奥村大介. 2019. Matsumoto Chiwaki no jintai hōshanō-ron: Nihon ni okeru seiō kindai kagaku juyō no ichidanmen 松本道別の人体放射能論—日本における西欧近代科学受容の一断面. In: Kurita Hidehiko 栗田英彦, Tsukada Hotaka 塚田穂高, Yoshinaga Shin'ichi 吉永進一 (eds.). *Kingendai Nihon no minkan seishin ryōhō: fukashina/okaruto enerugii no shosō* 近現代日本の民間精神療法: 不可視な(ルビ: オカルト)エネルギーの諸相. Tokyo: Kokushokankōkai, 51-77.
 2. *Translators' note:* for a discussion of *reijutsuka* and related terms, see the introductory paper of this special issue.



The first section offers an overview of the relationship between traditional Japanese ideologies and the modern Western European scientific thought that was introduced into Japan from the 1850s onwards. The second section provides an explanation of “imponderable fluid,” an important concept for the history of science and the central theme of this paper. The third section covers the circumstances in Japan around the reception of the concept of “imponderable fluid,” while the fourth section uncovers the mystical adoption of “radioactivity.” Finally, the fifth section is a discussion of Matsumoto’s ideas. The lengthy introductory explanations before the investigation of Matsumoto’s case serve to cover a relatively specialist subject: the history of the Japanese reception of the imponderable fluid concept. Sections 1 to 4 consist, therefore, of a comparative cultural history of science in Japan and Euro-America.

Traditional Thought and Modern Scientific Thought

How was scientific thought formed in modern Japan? From a historical perspective, the archetype of modern Japanese scientific thought was an amalgam of various scientific ideas that had emerged in Western countries, such as England, the United States, Germany, France and the Netherlands, and which rushed into Japan like a disorderly torrent, flooding an intellectual world that lacked at the time a systematized conceptual framework. Various scientific ideas of Euro-American origin were therefore translated and introduced into the modern Japanese intellectual world in a fragmented way. New associations were, as a result, created and some ideas took on new meanings. What occurred was not a transplanting of individual ideas, but rather the formulation of a new discursive space that used the Japanese language to frame these ideologies relationally. From that discursive space arose a mixture of preexisting Japanese ideas and Western scientific ideas, that led to frequent back-and-forth movements between rationalism and mysticism, universality and specificity, the modern period and the premodern period, science and the unscientific, Japan and the West. I offer below three examples.

First, Ishizuka Sagen 石塚左玄 (1851–1909), a Meiji-era doctor, wrote a theory of nutrition called *shokuyō* 食養 (*Food Cures*). In it, he coins the doctrine of *fūfu arukari* 夫婦アルカリ (lit. “marital alkalis”) to describe a division between foods that he considered as high in sodium ions (what were known as *yang* foods in traditional Chinese medicine 漢方 *kampō*) and foods that were high in alkali ions (*yin* foods). In an attempt, therefore, to use the two types of ions to explain the correspondence between *kampō* and the *yin-yang* divinatory system that forms its basis, the sodium salt is seen as the husband, and the potassic salt is seen as the wife. Another example is that of Oka Asajirō 丘浅次郎 (1868–1944), a biologist who significantly contributed to the adoption of evolutionary theory in Japan. Oka’s vision of humanity’s eventual collapse, which he connected to evolutionary thought, had much in common with the Buddhist theory of impermanence. Looking for other examples further into the twentieth century, the

idea of *Nihonteki kagaku* 日本科学 (Japanese Science) that was promulgated before and during WWII, aimed at formulating a unique science based on the Japanese mind by placing natural science (usually seen as “universal”) in the particular historical and ethnic context of Japan. The physiologist Hashida Kunihiko 橋田邦彦 (1882–1945), who was a representative proponent of this theory, equated the Western European notion of holism with the Zen Buddhist concepts of *bushin ichinyo* 物心一如 (lit. “unity of body and mind”), and further linked it to ultra-nationalistic totalitarianism.

Naturally, there was a merging of premodern ideas with science at the dawn of modern scientific thinking in the European West too. At the end of the Enlightenment era and after the French Revolution, for example, an event held in Paris called the Festival of the Supreme Being (*Fête de l'Être Suprême*), promoted the belief in and worship of reason. Later, in the Romantic era, traditional philosophical and theological topics, such as the human spirit or theophany, were translated using scientific concepts reflecting the Enlightenment's reasoning. These heralded the transition from Romanticism into Naturalism (including what could be called Natural Scientism). Influenced by studies of electricity in the previous century by Luigi Galvani (1737–1798) and Benjamin Franklin (1706–1790), the nineteenth-century German Romantic poet Novalis (1772–1801), for example, thought that the essence of the human spirit or the foundation of the universe all originated from electric sparks. The philosopher Franz Xaver von Baader (1765–1841) saw lightning as a theophany.

However, modern Japan saw stranger and more complicated examples than the above. Concepts of vastly different origins and logical standards became curiously enmeshed and gave rise to unusual new theories. In Western Europe, science blended with philosophy, religion, and literature, even while preserving its continuity with the local culture. In other words, the harmonious body of knowledge that had, since ancient Greece and Rome, slowly blended together, from about the eighteenth century split into newly formed academic disciplines, which, in turn, produced concepts that interacted between each other and moved across these disciplines, even though they shared a common origin. Japan, however, witnessed a double structure, where the modern science of the European West was overlain onto Japanese thought. This is what makes Japan's case a peculiar one.

To see how Japanese scholars of the theory and history of sciences have made sense of this situation, I take the example of the 1980 publication by Murakami Yoichirō 村上陽一郎, *Nihonjin to kindai kagaku* 日本人と近代科学 (*Modern Science and the Japanese*) in which the author summarizes the above phenomena as follows (Murakami 1980: 10-17). Murakami argued that Western European modern scientific thought is structurally based on six elements:

1. the division between objectivity and subjectivity
2. the denial of anthropomorphism
3. mechanical naturalism and the exclusion of teleology
4. control over Nature

- 5. the idea of progress
- 6. individualism³

At the time of Japan's importing of modern Western European science, the national goal was "to enrich the nation and fortify the army" (*fukoku kyōhei* 富国強兵). The principles stemming from the above six-part structure differed greatly from those that lay at the foundations of Japanese culture, but those differences were ignored, and science was introduced as technical knowledge. Thus, the foundations of Japanese thinking were preserved, and modern Western European science was added on top of them as a technological system. That is to say, there was no conflict or standoff, at least superficially, between the fundamental constructs of modern Western European science and Japanese thought and culture. In other words, the foundations of Japanese thought and culture did not collapse under modern Western science. This is the general gist of Murakami's argument. After all, the schema described by Murakami is, even by today's standards not unusual since it only points out a dualistic structure of culture that has sometimes been called "Japanese spirit, Western technology" (*wakon yōsai* 和魂洋才) or "Eastern ethics, Western arts" (*tōyō dōtoku, seiyō geijutsu* 東洋道德西洋芸術), and which has been supported by many surveys of historical documents and detailed theoretical debate.⁴

Then there is the work by Watanabe Masao 渡辺正雄, also titled *Nihonjin to kindai kagaku* 日本人と近代科学 (*Modern Science and the Japanese*, 1976), in which the

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- 3. From today's point of view, there are reservations about the idea that these six points are the foundational principles of modern Western European science. Murakami himself in this same publication includes some reservations about these six points. For the purpose of this paper, it is sufficient to recognize that in Western European modern science there are several foundational ideological constructions, but I cannot investigate the suitability of each item here.
 - 4. Nevertheless, one can raise doubts in regards to Murakami's argument that contrary to the Christian creationism that is a fundamental construct of modern Western European science, "we, Japanese, never conceived of a creator of nature, nor did we ever recognize in a creator the existence of a strong will imposed onto this universe" (Murakami 1980: 22). Even if the Christian God is different from the *Zōkasanshin* (造化三神 the Three Creator Gods), *Amenominakanushi* 天之御中主神, *Takamimusubhinokami* 高御産巢日神 and *Kamimusubhinokami* 神産巢日神 that appear in the *Kojiki* 古事記 (*Records of Ancient Matters*) and in the *Nihon shoki* 日本書紀 (*The Chronicles of Japan*), and even if the Creation in Christianity (*tenchi sōzō* 天地創造) and the Creation in Japanese mythology (*tenchi kaibyaku* 天地開闢) are not simply the same thing, they prove that at least since the eighth century, we Japanese possessed the idea of (a) creator god(s).

author identifies three primary issues with the introduction of modern science and the adoption of Western academic culture in Japan:

1. only the technologies were introduced, copied and applied without concern for the cultural and ideological basis that gave rise to them;
2. each area of study was taken up separately as a specialized field, without regard to the close connectivity that linked each of the various disciplines of Western academic culture; and
3. Western scientific and domestic cultures were allowed to coexist with no association between each other (Watanabe 1976: 7).

This, too, in general terms, should not be taken as an incorrect judgement, although there is some doubt about the third point. On this point, Watanabe himself alludes, for example, to the “exceptional case” of Oka Asajirō, who “assimilated the biology and theory of evolution that he had learned in Germany, after reconstructing those under the Japanese ideological framework of impermanence (*mujo* 無常)” (Watanabe 1976: 6).

Yet, questions remain as to whether, as Murakami and Watanabe state, modern Western European science and Japanese culture have always been in a two-layered relation, from the time the former was introduced to Japan up until recent years; and whether this relation persisted in the form of “Japanese spirit, Western technology.” Furthermore, were there mostly cases of no association between Japanese culture and Western scholarly culture, as Watanabe claims? And were instances such as Oka’s indeed exceptional?

This paper intends to show that the matter was otherwise. Indeed, when we focus on those among Japan’s modern scientific thinkers who have been largely ignored by historical studies, namely those who were not part of the academic community (which centered around the imperial universities), then we find examples that illustrate a different story and which inform my earlier use of the adjective “peculiar.”

Through the following analysis of Matsumoto Chiwaki’s ideology, I want to show that, far from the simplistic two-layered construction claimed by Murakami, complex discourses abound in the reception of Western European science in modern Japan, and that the discursive space of this era presents the characteristics of a sort of heterotopia (Foucault 2005: 9). My examination of the concept of “imponderable fluid” is precisely part of such a heterotopia.

Imponderable Fluids

An imponderable fluid is literally a fluid whose weight, volume, and other qualities cannot be measured, and one which often cannot even be seen or perceived. It was initially a concept which was introduced in late medieval and early modern Western European scientific thought, in order to explain physical, biological, and chemical phenomena. Various types of *subtle fluids* were imagined at the time: the term *caloric*

was coined to describe the phenomenon of heat; *phlogiston* explained the phenomenon of combustion; *animal spirit* was the principle associated with the various mechanisms of life; and *ether* was thought to be the most universally present fluid because it carried light and gravity. Advances in the field of chemistry, the accumulation of anatomical and physiological knowledge, and the development of thermodynamics put the existence of the caloric, the phlogiston, animal spirit and the like into doubt. And even if these came to be later understood as concepts referring to kinds of energy and to quantifiable chemical and electrical functions of living organisms (such as the functions of the endocrine system and the electrical potential of the nervous system), the question as to whether *ether* actually existed or not continued to be a point of great interest in Western European scientific thinking up until the end of the nineteenth and into the beginning of the twentieth century.⁵

In the natural philosophy of ancient Greece, ether was the substance that was considered to be the structural element of the celestial world. It differed from the four elements (earth, water, fire, air) which constituted the earthly world. In the early modern era, ether was assigned the role of the medium by which forces such as magnetism, gravity, light and electricity were transmitted. Traditionally from ancient times, Western European ideas regarding nature did not recognize remote action, namely the existence of a force that would act in the space between two distant objects.

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5. The modern concept of ether as an imponderable fluid ceased to play a role in the latter half of the nineteenth century. Through the concept of the electromagnetic field proposed in 1864 by James Maxwell (1831–1879), it became clear that electricity and magnetism work through fields. Unlike imponderable fluids, a field is not a substantial entity, but rather a space in a so-called state of tension. And it was thought that a body could affect another body directly depending on the nature of the field. At the same time, according to Maxwell's theory, electricity and magnetism are unified into an electromagnetic field where one gives structure to the other. The concept of ether was further pushed into the background of the history of scientific thinking, when in 1887, two American physicists, Albert Michelson (1852–1931) and Edward Morley (1838–1923) carried out an experiment to accurately measure ether. This experiment was carried out thoroughly, but they were unable to observe it. For more on the transition from the concept of a *force* that causes an effect at a distance, to the concept of a *field*, see Hesse (1961). However, one could consider that more recent concepts in theoretical physics, such as *zero-point energy* and the *Higgs particle* play, at least partly, what once used to be the role played by the concept of ether. In fact, these concepts of zero-point energy and the Higgs particle can essentially be taken as the ether of modern times; thus we cannot claim that the concept of ether has completely disappeared. For more on this topic, see, for example, Whittaker (1951); Takeuchi (2000: 241–242); and Öguri (2012).

Ostensibly, phenomena like magnetism, gravity, light, and electricity, which appear as if they work in the space between two remote objects, were explained by assuming the existence of some kind of medium. Ether (and various other imponderable fluids) was nothing more than such a medium. Depending on the era and author, electricity and magnetism themselves were conceptualized as imponderable fluids, and there was a time when even fire was thought to be an imponderable fluid.⁶

A crucial topic in the history of Western European theories of imponderable fluids, especially in its relationship to modern Japanese scientific thinking, which I discuss in the second half of this essay, is that of *animal magnetism*. Animal magnetism is a concept proposed by a German-born doctor who worked in Paris, Franz Anton Mesmer (Frédéric-Antoine Mesmer, 1734–1815).⁷ Mesmerism (animal magnetic therapy), which Mesmer was performing at the end of the eighteenth century, was based on the control of an invisible, imponderable magnetic fluid thought to be diffused throughout the universe. By coordinating the flow of this fluid inside the human body, the treatment was meant to cure the diseases of the mind and the body. This treatment, which today would be considered a kind of hypnosis, swept across late eighteenth-century Europe and the New World and became very popular.⁸

Followers of Mesmer formed a lodge (later, the Society for Universal Harmony or Société de l'Harmonie Universelle) to promote the spread of mesmerism, and their activities produced favorable results. This Society also played the role of a kind of secret society which fostered a radical political ideology later associated with the French Revolution. In 1784, Louis XVI (1754–1793), no longer able to overlook the fervor of mesmerism, established a board of examination made up of members of the Faculty of Medicine and the Academy of Sciences, and also an investigative commission from the Royal Society of Medicine. The conclusion of both commissions was that they found

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6. For more on the history of the concept of imponderable fluids, see Metzger (1930) and Shimao (1976). For more on the relationship between the human body and imponderable fluids, Yoshinaga (1996) provides an extremely important discussion.
 7. Although Mesmer was born in Germany, it is his activities in Paris that are significant for animal magnetic therapy. Since most of the sources I used for this paper are originally written in French, I use a Japanese transliteration of his name that is based on the French pronunciation (*Mesumeru*). And the same rule stands for “mesmerism” (*mesumerisumu*). As I will later note, in Japan these words were, however, originally imported through the English language, hence the more frequent *Mesumā* and *mesumerizumu*.
 8. Ellenberger (1970) remains the classic study that equated mesmerism to hypnosis and placed it within the history of psychiatry. For research on the social history of mesmerism in Europe from the end of the 18th century into the first half of the 19th century, see Darnton (1968).

absolutely no evidence of the physical existence of any kind of magnetic fluid, and they resolved that mesmerism was an act of imagination (Ellenberger 1970: 76). After that, writings that were critical of mesmerism were published one after the other. Then in the same year, a demonstration of mesmerism carried out in the presence of the Prince of Prussia, ended in failure, and Mesmer became greatly discouraged. He left Paris the following year and disappeared from the front stage of history.⁹ Soon after Mesmer left the scene, his pupil, Marquis de Puységur (1751–1825) reframed the treatment of animal magnetism as “magnetic sleep” (*sommeil magnétique*). This development subsequently led to the concept of hypnotism and mesmerism, as a technique using an imponderable substance called animal magnetism, retreated into the background of medical history.

Nonetheless, in the English-speaking world, there continued to exist, even into the nineteenth century, a number of theorists who took mesmerism to be the operation of imponderable fluids. For example, John Bovee Dods (1795–1872), one of the most famous American mesmerists, in his *Six Lectures on the Philosophy of Mesmerism* (Dods 1854),¹⁰ maintains a substantialist view that asserts the existence of imponderable fluids. In this work, he argues that the human nerves “are charged with a nervo-vital fluid, which is manufactured from electricity,” and that “the nervous systems [contain] the magnetic fluid” (Dods 1854: 16). It is said that 3,000 copies of this book were sold in the month after its publication (Yoshinaga 1996: 118), a number that attests to its significant influence. In England too, professor of medicine at the University of London, John Elliotson (1791–1868), the authoritative president of the Royal Medical and Chirurgical Society, began from 1837 to take an interest in mesmerism, and on his way to becoming England’s first eminent mesmerist, he espoused the substantialist stance that explained mesmerism in terms of magnetic fluid (Oppenheim 1985). In continental Europe, mesmerism eventually came to be known as the phenomenon of hypnotism, while in the English-speaking world, the imponderable fluid-explanatory model continued to exert a certain level of influence, even though this was not necessarily the mainstream stance.¹¹

9. He later moved via Vienna to a small village in Switzerland where he lived the rest of his life peacefully until his death in March 1815.

10. Originally published in 1843, in Boston, by Willam A. Hall & Co. (*Translators’ note*: here, the original Japanese text writes 1847, but in the course of checking the sources of this paper, we corrected this date to 1843, which appears to be the earliest date of publication. The original documents can be read online on the website of the HathiTrust Digital Library, <https://catalog.hathitrust.org/Record/100133446>)

11. However, in England, only a few scholars recognized magnetic fluids (as did Elliotson); most medical scholars in the 1830s and 1840s were skeptical of the existence of animal magnetism. See Oppenheim (1985: 274-275).

This point becomes important later when we look at the history of the reception of mesmerism in modern Japan. At the beginning of the nineteenth century in continental Europe, mesmerism became less popular as a medical procedure. Still, it continued to exert an influence in broader cultural fields such as literature, philosophy, and in political and religious ideologies.¹² For example, Percy Bysshe Shelley (1792–1822) wrote in *Prometheus Unbound*, “borne beside thee by a power ... Magnet-like, of lovers’ eyes” (Shelley 1820); and Honoré de Balzac (1799–1850), writes in his short story of 1833, *Le Message*, “...attraction magnétique, impossible à expliquer” [a magnetic attraction, impossible to explain] (Balzac 1833: 362). Such expressions attest to mesmerism’s and animal magnetism’s impact on the cultural history of the West.¹³

At this point if I was to frame up a conceptual history of imponderable fluids, including mesmerism and animal magnetism in the Western European context, it would be as follows:

1 – Phenomena such as magnetism, gravity, light, and electricity, which were seen as acting in the space that separates objects, from the seventeenth century onwards came to be understood as manifestations of the effect of a medium, a substance called imponderable fluid. These substances, during the development of chemistry, biology and thermodynamics in the nineteenth century, were then re-conceptualized as various types of energy. Furthermore, after detailed experiments and the development of the theory of electromagnetic field, ether was not only discarded in theoretical terms but also invisible in actual measurements.

2 – Mesmerism as a therapy based on animal magnetism, an imponderable fluid acting on living organisms, came to be understood by mainstream scientists not as a function of the substance known as animal magnetism, but rather as a hypnotic effect caused by the practitioners’ speech and conduct.

These two points, as the philosopher Ernst Cassirer pointed out in his *Substance and Function* (Cassirer 1910),¹⁴ can be understood as the transition from substance (imponderable fluids) to function (energy, field theory, and hypnosis theory). Following on from that, I want to re-emphasize the following point:

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12. For example, even today in English, the verb “to mesmerize” (lit. to use a Mesmer-like technique) means to put someone under hypnosis, or to charm someone as if one had hypnotized that person.
 13. Examples like this are abundant in nineteenth-century European literature. For more on the influence of mesmerism in the history of literature, see Tatar (1978).
 14. In this paper, *Funktionsbegriff* is translated as “function.”

3 – In the English-speaking world of even the mid-nineteenth century, there were still some theorists who used the principles of imponderable fluids to explain mesmerism. Furthermore, the concept of magnetic fluids continued to echo in the fields of literature and philosophy.

The above is a broad survey of the scientific theories of “force” and “function” in the history of Western European scientific thought from the early modern era until the late nineteenth century.

How was this kind of conceptual arrangement from the history of Western European scientific thought imported into modern Japan? This was, of course, no simple matter of importing, which is probably foreseeable given our reference to the heterotopian nature of cultural thought in Japan at the time.

In the next section, I will clarify how this heterotopia encountered the imponderable fluids which had all but vanished in Western Europe, and what kind of reaction this concept elicited. Here a cultural trend emerged that, in fact, ought to be appraised as nothing else than ‘mesmerizing.’

The Reception and Popularity of Mesmerism in Japan

The doctor Shibue Chūsai 渋江抽齋 (1805–1858), made famous through the biography penned by Mori Ōgai 森鷗外 (1862–1922), had a son, Shibue Tamotsu 渋江保 (1857–1930). Tamotsu appears in Ōgai’s *Shibue Chūsai* (1916), and, is the semi-protagonist of the story’s second half. In the later Meiji period, Shibue Tamotsu produced many publications related to hypnotism, under the pen-name Shibue Ekiken 渋江易軒.¹⁵ Among them was a piece titled *Jinshin jiryoku suiminjutsu* 人身磁力催眠術 (*Human Magnetic Hypnotism*, 1909), in which “human magnetism” was nothing else than Mesmer’s animal magnetism.

Mesmerism was introduced quite early into Meiji Japan. The earliest appearance that we can ascertain was published in 1873 by Shibata Masakichi 柴田昌吉 and Koyasu Takashi 子安峻編: *Fuon sōzu eiwa jii* 附音挿図英和字彙 (*An English and Japanese Dictionary: Explanatory, Pronouncing, and Etymological, Containing all English Words in Present Use, with an Appendix*, Nisshūsha 日就社). The entry on mesmerism is translated as *dōbutsu jikiriyoku* 動物磁気力 (animal magnetism). The first book about mesmerism was written by Suzuki Manjirō 鈴木万次郎, published in 1885: *Dōbutsu denki gairon* 動物電気概論 (*An Introduction to Animal Electricity*, Iwafuji Jōtarō 岩藤錠太郎). Although Suzuki does not mention the name of the original author anywhere in

15. See Shibue 1909a to 1909h. See Shibue 1910 for a collection of translations from English texts. For more on Shibue Tamotsu and mesmerism, see chapter 6 of Nagayama (2007).

the book, we can presume that it contains translations of a selection of Dods' works.¹⁶ Furthermore, it is evident from the title of these translations that there is confusion between or a mingling of animal magnetism and animal electricity (galvanism); in Europe, a similar mingling of these terms can be observed in German Romantic literature and philosophy.

In this way, mesmerism, equated with hypnosis, was vigorously introduced into Meiji Japan, and went through a phase as a popular cultural phenomenon. For example, in *Wagahai wa neko de aru* 吾輩は猫である (*I am a Cat*, 1905) by Natsume Sōseki 夏目漱石 (1867–1916), there is a scene where Mr Kushami (Mr. Sneaze) is subject to hypnotism by Doctor Amagi (although the hypnotism doesn't work). Then there is the short story, *Masui* 魔睡 (*Hypnosis*, 1909), by the aforementioned Mori Ōgai. It is a story about the feelings of a husband, a university professor, who suspects his pregnant wife was sexually assaulted by a doctor while she was hypnotized.¹⁷ There is also *Hōkan* 幫間 (*The Jester*, 1911) by Tanizaki Jun'ichirō 谷崎潤一郎 (1886–1965), with a scene where a geisha called Umekichi hypnotizes the jester Sampei, and although the technique is not effective, Sampei pretends to be hypnotized in order to please Umekichi. In the same way, therefore, that Balzac, Shelley and other writers of early nineteenth-century Western Europe came to include the theme of hypnosis in their literature, the recently introduced hypnotism inspired the Japanese literature of the early twentieth century too.

Although I used the expression “mesmerism, equated with hypnosis,” we must still consider in more detail whether they were truly equated. By the latter half of the nineteenth century, when mesmerism was introduced into Japan, the mainstream view in Europe was that hypnotism was not a physical phenomenon due to an imponderable fluid called animal magnetism, but rather a psychological phenomenon due to the hypnotic effects that a therapist's words had on a patient. Yet influential theorists of

16. *Translators' note*: More specifically, pp. 1-11 are a translation of pp. 8-17 of *Six Lectures on the Philosophy of Mesmerism* (Boston: William A. Hall, 1843); pp. 11-15, pp. 17-21, pp. 21-32 and pp. 32-42 are from pp. 18-23, pp. 51-57, pp. 205-224 and pp. 216-224 respectively of *The Philosophy of Electrical Psychology* (New York: Fowler and Wells, 1852). The provenance of the content of pp. 15-17 is unknown. Ioannis Gaitanidis would like to thank Yoshinaga Shin'ichi for this information.

17. *Translators' note*: Mori apparently used the outdated term *masui* (“magic sleep,” which by late Meiji referred to anesthesia) instead of *saimin* (the current term for hypnosis) in order to distance the story from the real experience of his wife with a famous physician associated with the imperial household, upon whom the doctor of the story is modeled. See Ichiyanagi (1994: 122–138); Michael Dylan Foster, *Pandemonium and Parade* (University of California Press, 2009), p. 243, n. 17.

mesmerism in mid nineteenth-century England and America continued to ascribe it to a physical phenomenon, namely the imponderable fluid of animal magnetism. In addition to the aforementioned examples of Dods and Elliotson, there was also the mesmerism-influenced odic force (Lebenskraft Od) proclaimed by the German chemist Karl Ludwig Freiherr von Reichenbach (1788–1869).¹⁸ Accordingly, by the 1870s, when we can confirm the first appearance of concepts referring to mesmerism in the Japanese discursive space, there is a high probability that writings treated of mesmerism in both senses: as a functional concept of hypnosis and also as a physical concept related to the effect of an imponderable fluid.

As stated at the beginning of this paper, even if dealing with the same phenomenon, writings produced by different authors, in diverse locations, periods and languages, and expressing various interpretations of that phenomenon flowed into Japan in a disorderly manner and were then decoded, translated, and introduced in fragmented form into the Japanese intellectual space, where each of these individual ideas acquired new meanings and interacted in new formats. What occurred then was a state of confusion: functionalist theories of mesmerism as hypnosis coexisted with substantialist theories of the imponderable fluid of animal magnetism, which also coexisted with other understandings as that, for example, seen in Shibue's *Human Magnetic Hypnotism*, where functionalist and substantialist interpretations of mesmerism become blended. In the end, the reason for all this was that mesmerism in Western Europe was the object of a conceptual tug of war between physiological and psychological discourses, in which the conceptual details often differed, and resulted in endless variations that exacerbated the already confusing situation, inviting even more chaos.

The Concept of Radiation

As therapies based on magnetism became more and more popular, news of the discovery of radiation soon became connected with occultism (*shinpishugi* 神秘主義). In 1895, when Wilhelm Röntgen (1845–1923) discovered X-rays, Tokyo University Physicist Yamakawa Kenjirō 山川健次郎 (1857–1931)¹⁹ promptly learned of it and

18. In the history of chemistry, Reichenbach is known for the discovery of paraffin and creosote. He pursued the 'od' from the 1840s, and the first time he wrote about the odic force is surely his *Odisch-magnetische Briefe* (Stuttgart: J.G. Cotta, 1852).

19. A physicist and Yale graduate, Associate Professor at Tokyo Kaisei School (later integrated into the University of Tokyo). In 1879 he was professor at the University of Tokyo and in 1901 president of Tokyo Imperial University. He was the first professor of Physics at the University of Tokyo.

carried out a follow-up experiment. X-rays 'see through' matter.²⁰ Shortly after that, two women emerged: Mifune Chizuko 御船千鶴子 (1886–1911), who claimed clairvoyant abilities that allowed her to 'see through' objects at a distance without using X-rays, and Nagao Ikuko 長尾郁子 (1879–1911), who in addition to clairvoyance, claimed to perform "thoughtography" (*nensha* 念写) by exposing X-rays on to dry photographic plates [with her mind]. Fukurai Tomokichi 福来友吉 (1869–1952) and his team at Tokyo Imperial University carried out experiments to confirm Mifune's clairvoyant abilities, and Yamakawa himself assisted and collaborated on experiments of Nagao's clairvoyance and thoughtography. These are known as the Clairvoyance Incident (*Senrigan jiken* 千里眼事件).²¹

In the rest of this paper, I selected, out of this chaotic discursive space into which Western European science had flooded, one *reijutsuka* who re-interpreted various spiritualist theories through the concepts of radioactivity and radiation, and who, as a result, constructed his own spiritual theories. The background to this was mesmerism. Now that I have established a firm premise, I will turn to the case of Matsumoto Chiwaki, and peer into one facet of the heterotopia of modern Western European science and occultism.

*The Blending of Japanese Thought with the Concept of Imponderable Fluids:
Matsumoto Chiwaki's Theory of Human Radioactivity*

Matsumoto Chiwaki was a *reijutsuka* who was active from the Taishō era through to the early Shōwa era. Until one generation ago, there were only a few references to Matsumoto in the history of modern Japanese thought and culture.²² His beliefs and practice became known in outstanding scholarly research such as *Yamai to shakai* 病いと社会 (*Illness and Society*) by Tanabe Shintarō 田邊信太郎 (Kōbundō, 1989); *Iyashi wo ikita hitobito* 癒しを生きた人々 (*Those Who Lived Through Healing*) by Tanabe et. al. (Senshū University Publishing, 1999); and *Iyasu chi' no keifu* 癒す知の系譜 (*A Genealogy of Knowledge on Healing*) by Shimazono Susumu 島蘭進 (Yoshikawa-kōbunkan, 2003); and also through the near-simultaneous publication by two print houses in 1990 of reprints of Matsumoto's major work, *Reigaku kōza* 霊学講座 (*A*

20. *Translators' note:* Okumura here uses the Japanese word *tōshi* 透視 ("to see through"), which is used both for X-rays and for clairvoyance.

21. For more details, see Ichiyanaagi (1994). *Translators' note:* For a discussion of the incident in English see Gebhardt (2004), Takasuna (2012).

22. Even the semi-classic general overviews, such as Aramata (1981) and Imura (1984), do not mention his name.

*Course in Spirit Studies*²³), originally published in four volumes by the Reigaku Hall of the Headquarters of the Human Radium Society (*Jintai Rajiumu Gakkai Honbu Reigaku Dōjō* 人体ラジウム学会本部霊学道場) from 1927 to 1928.

It is said that Matsumoto Chiwaki (real name, Junkichi 順吉) was born in 1872 in Ise.²⁴ In his infancy, his body was weak, and he was often ill. In his middle school years, his interest in the ideology of the Freedom and People's Rights Movement²⁵ became the reason for friction with his school principal, and it is said that he spent time in a Zen temple in Kyoto to study Buddhism. According to Matsumoto, his family tree included a long line of Japanese *kokugaku* scholars;²⁶ it is thought that these origins and the influence of political activism led him later to embrace a socialism centred on the imperial house. He is recorded as having graduated from Waseda Gakuen 早稲田学園 and as having then focused his efforts on research about national historic scriptures (*kokuten* 国典), embracing Motoori Norinaga's 本居宣長 (1730–1801) school of Restoration Shintō (*Fukko Shintō* 復古神道).²⁷ After that, having been “a fervent practitioner of socialism,” he was arrested in 1905 for instigating mass riots, and imprisoned until 1910.²⁸ In this era, many political prisoners experienced various ideological shifts behind bars—deepening their ideologies, developing them into

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23. See Tanabe (1990), for the four-volume set plus appendix with commentary published by Sōjinsha. The other one is Ōmiya (1990), published in a single volume by Hachiman shoten. In this essay, I have drawn quotes from Sōjinsha's edition.
24. Here, I give Matsumoto's dates as 1872–1942. The basis for this claim is the data on the National Diet Library OPAC, and also Tanabe (1990). Reference to Matsumoto's first name being Junkichi can be found in Tanabe (1990: 36–37). The following history of Matsumoto is taken from his own *A Course in Spirit Studies*, and also from the aforementioned Tanabe (1990).
25. *Translators' note:* The Freedom and People's Rights Movement *Jiyū Minken Undō* (*Jiyū Minken Undō*, 自由民権運動) emerged in the 1880s to call for elections and a constitution in Japan, inspired by various interpretations and combinations of Western liberal thought and earlier moral and political notions of fairness and benevolence.
26. *Translators' note:* *Kokugaku* (National Learning) was an intellectual nativist movement that arose in the eighteenth century around scholars who looked into early Japanese literature for “proof” of Japan's essential (i.e., non-Chinese / non-Confucian) character and roots.
27. This is taken from page 1 of Volume Three of *A Course in Spirit Studies*. Doubt remains as to whether “Waseda Gakuen” refers to Waseda University. It first opened in 1882 as a Tokyo College, and then it changed its name to Waseda University in 1902.
28. Around the same time, Ōsugi Sakae 大杉栄 (1885–1923) was also imprisoned for inciting mass riots. Matsumoto had associations with Ōsugi and the socialist Fukuda Hideko 福田英子 (1865–1927). See Tanabe (1990: 14).

something else, or even renouncing them—and Matsumoto was no exception. He was in prison in the coldest time of winter; yet each of his experiences—the coldness that would pierce the bones through the meager layer of prison clothes; his body, which did not even catch a cold despite the cruel conditions; the song of the sparrows through the iron-barred window—fueled his meditations. It is said that he even studied evolution and biology while in prison.²⁹

The following is an outline of the conclusions he reached from his research and thinking while he was behind bars. First, Matsumoto argues, humans acquired upright bipedal mobility through the process of evolution. As a result, standing and walking applied pressure to the internal organs. Then, with the liberated front legs (the arms), humans made many discoveries and started cooking their food. Another result of this was that intestines weakened and lost their vital energy (*kakki katsuryoku* 活気活力). Through the invention of clothing, humans lost the furry coat bestowed upon them by heaven. Since then, humans fell out of the grace of the *kami*, and no matter how much they conquer and use Nature, they suffer her revenge. And so, despite the advances of medicine, human bodies only become weaker. This is the punishment of Nature. Thus, “we stand before our extinction, if we don’t wake up from the artificial and fail to return to live out a natural life” (Matsumoto 1928, Vol 3: 4–5). With this conclusion in his heart, Matsumoto left prison and made a point of living a natural life to the best of his abilities. For this he saw animals as a benchmark (Matsumoto 1928, Vol 3: 6), and so he avoided cooked food, he bathed in natural sunlight and cold water, and he practiced deep breathing. As a result, he allegedly achieved excellent health and physical constitution.

Matsumoto sought a way to achieve even greater physical robustness. He tried such physical and spiritual/spiritualistic techniques as the popular Okada Method of Quiet Sitting (Okadashiki seizahō 岡田式静坐法) of Okada Torajirō 岡田虎二郎 (1872–1920), and the Taireidō 太霊道 (The Way of Great Spirit) of Tanaka Morihei 田中守平 (1884–1929).³⁰ Through this research, he arrived at the notion of *human radium* (later renamed *human radioactivity*). I will discuss the details of human radioactivity later in this section, but to explain it simply: every person has a unique radioactivity and can heal sickness through control of this radioactivity. In order to promote his research and spread this concept, Matsumoto established in 1917 the Human Radium Society (Jintai Rajiumu Gakkai 人体ラジウム学会) and became its president. He recruited

29 This was shortly after the first publication of a general introduction to evolutionary theory in Japan (Oka 1904), and such knowledge was at the time considered one of the latest scientific developments.

30 For more on Okada and his method of meditation, see Kobori (1999). For more on Tanaka and *Taireidō*, see Yoshinaga (2006).

members, held lectures, and allegedly cured diseases with human radium. In 1922, the Society published the first volume of *Jintai rajiumu ryōhō kōgi* 人体ラヂウム療法講義 (*Lectures in Human Radium Therapy*).

Around the same time, Matsumoto also devoted himself to research on spiritualism (*kōreijutsu* 交霊術). From 1927 and into the following year, the culmination of his work was published in the aforementioned four volumes of *A Course in Spirit Studies*, a compilation of texts on human radium theory and spiritualism. After that, he continued practicing healing, writing, lecturing and researching on human radium theory until his death from illness in 1942.

Matsumoto lived fundamentally as a *reijutsuka*, and, apart from the events surrounding his imprisonment in his younger years, he can be said to have had a relatively uneventful life. Nonetheless, his ideology, as expressed in *A Course in Spirit Studies* is replete with novel and eccentric ideas. He absorbed the thought of the natural scientists of his time, and although he wrote in a popular tone, he must have had considerably intellectual tastes. Let me now examine his human radium theory, as it appears in *A Course in Spirit Studies*.

First, in the foreword to the four volumes, he declares: “This course is a series of lectures on spirit studies (*reigaku*); it is organized as a juxtaposition of my recent discovery of *human radioactivity*, with the essentials of *reijutsu* from the East and West, of olden and contemporary times” (Matsumoto 1928, Vol 1: 1).³¹ What, then, is this human radioactivity?

As we mentioned earlier, after his release from prison, Matsumoto studied biology and evolution; he essentially considered what life is about. He acknowledged the workings of the *reishi*³² advocated by Tanaka Morihei. Still, he claimed that “these effects are the same as the animal magnetism which Mesmer advocated for in earlier times, and they don’t take into account the more fundamental functions of human life” (Matsumoto 1928, Vol 3: 8). It seems that he had become dissatisfied with mesmerism. “Apart from biology and evolution, I commenced research into radium, which had drawn much attention amongst Japanese scholars at the time. However, my research was limited to simply reading books, because I could not possibly buy the extremely expensive equipment. One day in the *Yorozu Chōhō* 萬朝報 newspaper, I read an article about a Dr Kaas (ドクトル、カース), an assistant at Heidelberg University in Germany,

31. All emphases in the quoted text hereafter are in the original. *Translators’ notes*: in-quote emphases are marked in italics.

32. *Translators’ notes*: Tanaka Morihei, the founder of Taireidō, had claimed that *reishi* 霊子 (spirit particles) emanating from the *Tairei* 太霊 (Great Spirit) formed the essence of all phenomena.

who discovered that radium had an effect on human internal organs. Contrary to things like *thoughtography*, which had raised issues in the academic world,³³ this newspaper struck me as a new hint, and this bud of a concept that was human radium began to bloom" (Matsumoto 1928, Vol3: 8).

With only this information, it is difficult to determine who Dr Kaas was and precisely what his discovery was.³⁴ In any case, Matsumoto soon carried out experiments. His were ideas he simply thought up after becoming dissatisfied with mesmerism, and they were truly bold undertakings. As the possible effects of suggestion cannot be eliminated from physiological or psychological experiments, he decided to perform physics experiments. He had learnt that radium radiation causes crystals to change color. He, therefore, experimented on some opaque crystals he had at hand, and reported that "the part that I hold in my hands gradually turns slightly clear," and further, "when I exhale on them strongly, one crystal progressively turned *transparent*." Matsumoto even claimed that these phenomena were reproducible. Over an experimentation period of about a month, he blew air on several dozens of crystals, and although there were differences in the level of transparency, he reached the conclusion that "human radiation has the ability to turn opaque crystals transparent" (Matsumoto 1928, Vol 3: 9). Through similar methods, he later succeeded in an experiment turning sugar cubes brown, and in 1917, he reported succeeding in using his breath to cause exposure to zinc sulphide photographic plates (Matsumoto 1928, Vol 3: 9–10).³⁵ Motivated by these results, Matsumoto contacted the newspapers, but the only paper to cover his story was the *Kokumin Shinbun* 国民新聞 (*People's Newspaper*), and this report contained negative comments from the manager of the store which provided the photographic plates.

33. *Translators' note*: Matsumoto probably refers here to the Clairvoyance Incident and to Fukurai Tomokichi, whose research on thoughtography eventually forced him out of Tokyo Imperial University.

34. *Translators' note*: further research in the process of this translation revealed that there is a high probability that this Dr Kaas is a certain Dr Albert Caan (1882–1938), a Dutchman who researched radiotherapy in Heidelberg from 1908 to 1912, and who wrote in 1911 an often-quoted paper in which he claimed organs emit radiation. The paper, "Über Radioaktivität menschlicher Organe" (On the Radioactivity of Human Organs) is accessible online at the Library of Heidelberg University, https://digi.hadw-bw.de/view/sbhadwmnkl_b_1911_5/0001/thumbs. Ioannis Gaitanidis would like to thank Juljan Biontino for his help in identifying Albert Caan.

35. Later, Matsumoto realized there were problems with this experiment. See page 32 of the same publication.

After that, with the help of his senior and close friend, Wadagaki Kenzō 和田垣謙三 (1860–1919),³⁶ he asked the aforementioned physicist Yamakawa Kenjirō, who had previously carried out tests on thoughtography and had since become the president of Tokyo Imperial University, to conduct an experiment, but he received no reply. According to Matsumoto, “When I pressed Dr Wadagaki, he told me, “The situation is like this. After President Yamakawa, I first brought it to the attention of Dr Nagaoka Hantarō 長岡範太郎³⁷ of the *Department of Sciences*, who thought that it was a matter of abnormal psychology, and so he passed it on to *Humanities’s* Dr Matsumoto Matatarō 松本亦太郎. However, Dr Matsumoto said this had to do with physiology, and so he referred it to the medical school. There, the president of the *Medical School*, Dr Aoyama Tanemichi 青山胤通, looked at the documents, claimed that he understood the idea, and that it was a *healing method based on physics*, so he passed it on to Dr Manabe Kaichirō 眞鍋嘉一郎, so, surely, we’ll get a response soon” (Matsumoto 1928, Vol 3: 11). In the end, however, none of the professors from the imperial university responded to Matsumoto’s idea of human radium.

Matsumoto continued his own private study and discovered that the rays emitted by human radium were *alpha rays* (Matsumoto 1928, Vol 3: 13). After that, he developed his own device for detecting human radium, and he furthered his research into physics. When he was absorbed by his research into biology and evolution, he had claimed to “*simply be a materialist, convinced of the absence of god and the soul.*” But as he progressed his research into human radioactivity, “influenced by *Western psychical research (shinrei kenkyū 心靈研究),*” he started leaning towards spiritualist theories (*shinreiron 心靈論*) (Matsumoto 1928, Vol 3: 15-16).³⁸

Next, I turn my attention to Matsumoto’s lectures to understand the details of the concepts of human radium and human radioactivity, whose ‘discovery’ led him to embrace spiritualism (*shinreijutsu 心靈術*). Matsumoto provides a general explanation of radium and radioactivity in *Scholarly Principles (Gakuri 学理)*, the third volume of *A Course in Spirit Studies* (Matsumoto 1928, Vol 3: 17–31). In terms of the scientific knowledge of that time, his understanding seems valid and accurate. His references include high standard works, such as *The Interpretation of Radium* (New

36. An economist and graduate of Tokyo Imperial University, who became professor in the Law School of the same university in 1886, and then Professor in the Department of Agriculture in 1898.

37. *Translators’ note*: this is probably Nagaoka Hantarō 長岡半太郎 (1865–1950), a pioneer of physics in Japan, who was at the time professor at Tokyo Imperial University.

38. The Western European scientific research into spiritualism he refers to here is probably the spiritualist ideologies of such late 19th century and early 20th century scientists as Sir William Crookes (1832–1919) and Alfred Wallace (1823–1913); for more, see Oppenheim (1985).

York: Putnam's Sons, 1909) by the English chemist Frederick Soddy (1877–1956), who won the Nobel Prize in 1921 for his research into isotopes and radioactive decay (Matsumoto 1928, Vol 3: 18). Matsumoto explains that human radiation has the same physical properties as the ordinary radioactivity of substances such as radium. He draws focus to the fact that both forms of radiation can cause exposure to photosensitive substances. He admits that there was a flaw in the 1917 experiment using zinc sulphide exposure plates (presuming that they contained small amounts of radium at the time of purchase), but stresses that the following year he carried out an experiment using powdered and crystalline zinc sulphide. Upon confirming with the supplier that these contained no radium, he kneaded the zinc chloride with his fingertips and saw it emitting a blue light. He says that he was then convinced of the existence of human radiation (Matsumoto 1928, Vol 3: 33). He explains that human radioactivity has the same physical properties as radium, and thus can cause ionization, exposure on the retina, and color change in crystals and rock sugar.

He then finally makes the following connection to spiritualist thought (*reigaku shisō* 霊学思想): “Alpha rays of radium are electrically positive, and *electricity causes a kind of vibration by stimulating the human nervous system*. It stands to reason from the outset that touching radium with the human body causes a stimulation” (Matsumoto 1928, Vol 3: 41). *Reijutsuka* such as Morihei Tanaka and Watanabe Tōkō 渡辺藤交 (1885–1975) thought that spontaneous movements of the human body called *reidō* 霊動 (lit. “spiritual movements” or “extraordinary movements”) were the initiating force behind healing. The fact that Matsumoto sees radium and electricity as having a vibrating effect on the body is an important connection with spiritualist thought. He also highlights the important relationship between breath and human radioactivity. Matsumoto claims that “breath generates human radioactivity” and explains this by using the theory of radioactive decay. He goes so far as to say that “the human spirit, the core of our lives, is... formless, yet, is *one kind of radioactive body*, and like radium, is ceaselessly emitting radiation” (Matsumoto 1928, Vol 3: 44).³⁹

From his knowledge that humans are radioactive and that radioactive waves stimulate changes in the human mind and body, Matsumoto began to embrace the idea of applying this human radioactivity to healing. From around 1919, he began experiments to heal disease, first trying on family and friends, and he argued that all experiments were successful (Matsumoto 1928, Vol 3: 14). However, treating grave illnesses did not produce the results he had hoped for, and he keenly felt the need for further research. He applied himself to the study of anatomy and physiology, and

39. Here, the word “radioactivity” is used to mean radiation. Furthermore, please note that, when Matsumoto equates human radium with human radioactivity, ‘human radioactivity’ signifies the radioactive nature of the human body.

made comparative studies with Japanese and Chinese medicine, massage, acupuncture and moxibustion, physiognomy, palmistry, yoga, prayer (*kitō* 祈禱), and a host of other techniques and systems concerning the mind and body. Out of this research, he eventually encountered the practice of spiritualism (*kōreijutsu*). The details are all contained in the fourth volume of his *Course in Spirit Studies: Spirit Possession and Communication* (*Kishin Kōrei* 帰神交霊). In this paper, it is not possible to investigate the entirety of his spiritual thinking; I will only examine his theories on human radium and human radioactivity, which I will summarize below.

Human beings have radioactivity. Human radioactivity has the same kind of physical and physiological qualities as radium's radioactivity, and it can exert an influence on the human mind and body. Moreover, the human spirit is a formless radioactive substance. Understood in this light, it becomes evident that *the theory of human radioactivity amounts to a Japanese mesmerism born at the beginning of the twentieth century*. Mesmerism was a claim that living things had magnetism in the same way that metals have magnetism, and that this magnetism can exert an influence on the human mind and body. In comparison to Mesmer—who never experimented with the measuring of the physical qualities of animal magnetism or claimed that the substance of the human spirit is a formless magnetic body—Matsumoto seems radical, even though his logic is structurally similar to that of mesmerism. As previously noted, Matsumoto is critical of mesmerism, or rather, he is dissatisfied with it. He states, “in the West, there are not yet theories of or references to human radioactivity; it is still called animal magnetism. They say that spirit possessions are manifestations that use the animal magnetism of a spirit medium” (Matsumoto 1928, Vol 3: 47). In other words, he acknowledges that human radioactivity is the same thing as animal magnetism: the imponderable fluid hypothesized in mesmerism.⁴⁰

It is now clear that Matsumoto's concepts of human radium or human radioactivity were Mesmer's hypothetical subtle fluids, or imponderable fluids (such as the magnetic fluid); but why did Matsumoto give them such *disconcerting* names as “radium” and “radiation”? Why did Matsumoto, who possessed a correct knowledge of mesmerism, focus not on magnetism or electricity for his research on humans and life, but on radium and radiation? This is likely because *radium and radiation were part of cutting-edge science at the time*. In the same way that German Romantic poets and philosophers sought the source of their poetic sensitivity and expression of God in the newest sciences of the time—the theories of Galvanism (animal electricity), and the electricity

40. It can also be assumed that when Matsumoto refers to possessions and mediums here, he has in mind the English spiritualists such as Elliotson and his peers. On page 13 of Volume 4 of *A Course in Spirit Studies*, Matsumoto writes to the effect that he was referencing “voluminous reports from the English Society for Psychological Research.”

of lightning—people who believe in the occult abilities of humans and the existence of godly beings often reference the latest science.

Incidentally, we imagine something quite dangerous these days when we hear references to radium or radioactivity. However, in Matsumoto's time, the circumstances were quite different from today. Radium is, of course, the radioactive element discovered by Marie Curie (1867–1934) and her husband, Pierre Curie (1859–1906). The word “radium” stems etymologically from the Latin *radius* (light or ray); *-ium* is a Latin noun ending, and in the modern language it is mostly used as an ending for the names of the metallic elements. Therefore, radium literally means an element which radiates. Furthermore, “radioactivity” is a term invented by Marie Curie, and it refers to the ability of a certain substance—such as radium—to emit radiation.

Today we know that the element radium is dangerous to human beings. But in 1896, when radium was discovered, the danger of radiation was not very well known, not even in the West. The danger of exposure to radioactivity first became known around 1895 when Röntgen discovered X-rays. From the end of the nineteenth century into the first half of the twentieth century, the harm of radiation gradually became clear, but we had to wait for the great calamities in Hiroshima and Nagasaki in 1945 for conclusive evidence of the danger of radiation for humans. Until that time, the effect of radioactivity on humans was not clearly known, and the idea that small amounts of these rays were actually beneficial for humans was not strange, as we can see in the contemporary vestiges of Japan's “radioactive hot springs.” Accordingly, in the time of Matsumoto—from the Taishō era into the Shōwa era—the concepts of human radium and human radioactivity at the center of his theories did not bear the dangerous image that they carry today.⁴¹

Conclusion

In this paper, taking as example Matsumoto Chiwaki's thought, I examined the form that concepts originating in the scientific thought of Western Europe took when they entered Japan between the Meiji and the early Shōwa eras, and the kind of ideas and culture that they gave birth to. The main focus was the concept of imponderable fluids, which enter into the human body and also radiate from it, which Matsumoto called

41. Even today, as in the example of radioactive hot springs, human cell stimulation by low levels of radiation is claimed to have health benefits. This effect is called radioactive *hormesis*. For more on the history or hormesis theory, see Dōmae (2001). There is much we still do not know about how Japanese understood nuclear energy and radioactive ways before the atomic bombs were dropped. Nakao (2015) is a valuable reference which analyzes representations of nuclear energy in Japan before the war through images of pre-war atomic bombs.

human radium and human radioactivity. In both cases, mesmerism was an important source of inspiration. Today, mesmerism is understood as having been introduced in modern Japan in the guise of hypnosis. However, mesmerism in Japan was not only a functionalist conceptual framework surrounding the simple phenomenon of hypnosis—namely, the effects of the imagination and of the suggestions induced by a therapist’s utterances—but, as in this case, there were also conceptual frameworks theorizing the *substantial effects* of subtle fluids, as it had been in Western Europe at the end of the eighteenth century when Mesmer himself was alive. This paper makes clear the strength of Matsumoto’s substantialist perspective.⁴²

Acknowledgements

On writing this paper, I received guidance from Professor Suzuki Akihito 鈴木晃仁 of Keio University, and for that I express my deep gratitude. This essay forms part of the research outcomes of Grants in Aid of Scientific Research 10J05482 and 14J095575.

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42. It is necessary to acknowledge the possibility that the conceptual framework which divides substantialist from functionalist theories was not necessarily clearly established in the Japanese discursive space around mesmerism at that time. In general terms the conceptual frameworks for materialism, spiritualism and the like already existed in the Meiji era, but it would require further detailed analysis as to how accessible those conceptual frameworks were to the proponents of mesmerism at the time.

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