

# Occult Chemistry and the Theosophical Aesthetics of the Subatomic World

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[See table of contents](#)

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## Article abstract

Plutôt que d'étudier l'influence de la théosophie sur les débuts de l'art abstrait, cet article prend pour objet la culture visuelle de la théosophie elle-même, en particulier les efforts déployés par Annie Besant et C.W. Leadbeater pour utiliser les transcriptions visuelles de l'expérience clairvoyante comme données *scientifiques*. Ces données ayant rapidement revêtu une dimension esthétique, le monde invisible des particules subatomiques a suscité un croisement entre la physique atomique et de l'occultisme qui a influencé la culture visuelle de la théosophie. L'accent mis sur la recherche expérimentale a poussé cette dernière à se détacher de l'esthétique symboliste axée sur la rêverie pour s'intéresser à l'abstraction des transcriptions « scientifiques » en *Thought-Forms* et aux géométries abstraites de la *Occult Chemistry*.

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# Occult Chemistry and the Theosophical Aesthetics of the Subatomic World

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## Résumé

Plutôt que d'étudier l'influence de la théosophie sur les débuts de l'art abstrait, cet article prend pour objet la culture visuelle de la théosophie elle-même, en particulier les efforts déployés par Annie Besant et C.W. Leadbeater pour utiliser les transcriptions visuelles de l'expérience clairvoyante comme données *scientifiques*. Ces données ayant rapidement revêtu une dimension esthétique, le monde invisible des particules subatomiques a suscité un croisement entre la physique atomique et de l'occultisme qui a influencé la culture visuelle de la théosophie. L'accent mis sur la recherche expérimentale a poussé cette dernière à se détacher de l'esthétique symboliste axée sur la rêverie pour s'intéresser à l'abstraction des transcriptions "scientifiques" en *Thought-Forms* et aux géométries abstraites de la *Occult Chemistry*.

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Art historians have known for many years that modern art—such as the abstraction of Kandinsky and his Blaue Reiter circle—was influenced to some degree by Theosophy, a movement launched in 1875 in spiritualist circles in New York. The Theosophical Society was founded by H.P. Blavatsky (1831–91) and Colonel Henry Steel Olcott (1832–1907). Blavatsky's major works, *Isis Unveiled* (1877) and the two-volume *Secret Doctrine* (1888), merged Western Hermeticism with elements of Eastern religions (primarily Hinduism and Buddhism). Her synthesis of Eastern and Western religious ideas and notion of a secret brotherhood of adepts living in the world appealed to many in the occult revival of the late nineteenth century.

As scholars began to argue in particular detail in the 1960s, Kandinsky's debt to Theosophy in *Über das Geistige in der Kunst* (1911) was more than superficial.<sup>1</sup> Rudolph Steiner's Theosophical interpretation of Goethe's aesthetic theories was important to Kandinsky, as was Blavatsky's work and that of her disciple and successor, Annie Besant. In particular, Besant and C.W. Leadbeater's 1901 volume, *Thought-Forms*, provided Theosophical interpretations of thoughts and emotions attributable to colours and abstract forms perceived by the clairvoyant as auras. *Thought-Forms* even offered a key to the meanings of colours and provided copious colour illustrations of thought-forms that might, in themselves, be seen as examples of abstract visual images at the turn of the century (figs. 1, 2).

But I would like in this article not simply to add another voice to debates about the extent to which early abstract painting was influenced by Theosophical texts. Rather, I wish to examine the visual culture of Theosophy itself, and, in particular, the efforts of key Theosophists Annie Besant and C.W. Leadbeater to use visual transcriptions of clairvoyant experience as *scientific* data—but data that quickly took on aesthetic dimensions for many adherents to a Theosophical worldview. As we shall see, this effort to make direct clairvoyant perception an element of a scientific research program was doomed to failure at the very moment when mainstream scientists were forced to grapple with what would seem to be the province of Theosophy and occultism in general: the unseen world. This unseen world

of atoms and newly theorized subatomic particles would allow an intersection of atomic physics and occult science that would influence the visual culture of Theosophy.<sup>2</sup>

From the late nineteenth century through the first quarter of the twentieth, clamouring voices debated the fundamental nature of matter. Theories proliferated from various corners of the scientific world and from the occult one as well. John Dalton's theory of indivisible fundamental particles—the elemental atoms of nineteenth-century chemistry—vied with theories from ether physics, such as the suggestion by Lord Kelvin (William Thomson) that an atom might simply be a vortex in the ether. William Prout's early nineteenth-century theory that all the elements were made up of differing numbers and configurations of hydrogen atoms, and his concept of the "protyle," contributed to Sir William Crookes's later elaboration of a matter from which all the elements were ultimately formed.<sup>3</sup> Yet Prout's and Crookes's theories could easily find confirmation by occult alchemists, who saw the protyle merely as a current scientific elaboration of the alchemical *prima materia*. The recent discovery of radioactivity further complicated scientific and occult understandings of the relationships between matter and energy and of the nature of atoms.<sup>4</sup>

In this cacophony, Theosophists attempted to propound an "occult chemistry." Such a "material science" was an effort to bridge the apparent divide between mechanistic science and spirituality. Occult chemistry, like the form of alchemy espoused by many Theosophists and some Hermeticists, explicitly addressed the role of the will and the mind of the spiritually purified adept in manipulating the matter of the physical world. The project (and its efforts at scientific validation) of necessity addressed what became a major component of atomic science across the twentieth century: the role of instruments in gleaning information about an invisible subatomic world.

Over the last three centuries, instrumentation had begun to play a central part in the practice of chemistry and physics—and has since been crucial to the emergence of new theories of matter.<sup>5</sup> Given the human inability to *see* subatomic particles, scientists invented a variety of detectors that confirmed the existence of a particle or the occurrence of a subatomic

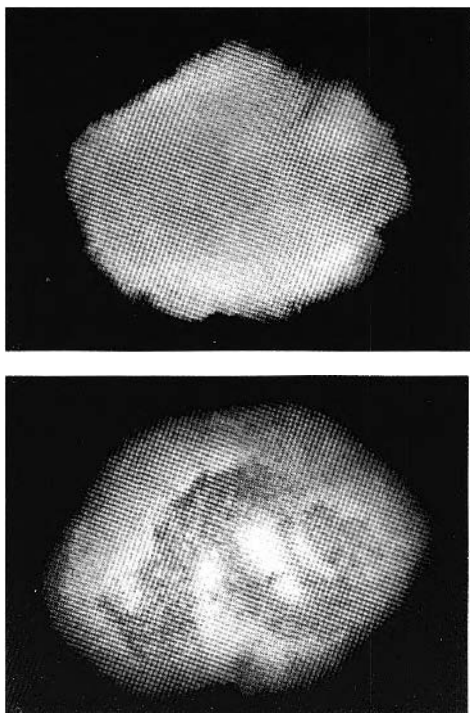


Figure 1. [John Varley, Mr. Prince, or Miss Macfarlane] Thought-forms of "Vague Pure Affection" (top) and "Vague Selfish Affection" (bottom). Reproduced from Annie Besant and C.W. Leadbeater, *Thought-Forms* (London, 1901), plate between pp. 26 and 27.

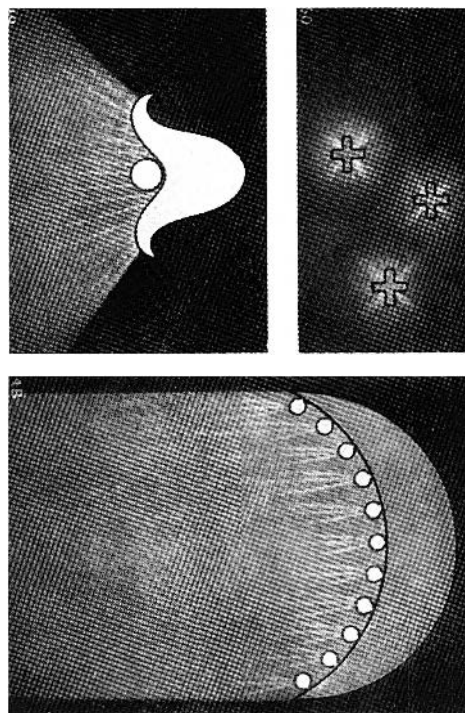


Figure 2. [John Varley, Mr. Prince, or Miss Macfarlane] Thought-forms of "Helpful Thoughts." Reproduced from Annie Besant and C.W. Leadbeater, *Thought Forms* (London, 1901), plate between pp. 56 and 57.

event by examining an effect of that event. The spectroscope, cathode-ray tube, electrometer, spintharoscope, cloud chamber, and ionization chamber, for example, allowed turn-of-the-century scientists to detect signs of an otherwise imperceptible atomic world.

C.T.R. Wilson's 1895 invention of the cloud chamber and Donald Glaser's 1952 invention of the bubble chamber allowed major breakthroughs in, respectively, low-energy and high-energy particle physics. These instruments allowed investigators to "see" particles by seeing their trails in condensation lines or bubble lines. (Both Wilson and Glaser won Nobel Prizes for their inventions.) But these chambers represent only one direction in instrumentation. Peter Galison has identified contrasting traditions of experimentation in twentieth-century physics:

One embraced the visual detectors, such as the cloud chamber and the bubble chamber, which etched onto film the fine details of individual events. Quite another tradition formed around electronic detectors... Only in the early 1980s [did] these two traditions merge when electronic detectors [be-

came] capable of producing computer-constructed images that [were] so well resolved that individual events [acquired] significance.<sup>6</sup>

Both varieties of detectors presuppose the value of perception, but of a secondary nature—an observation of the effect of a particle, rather than of the particle itself—in the development of scientific theory and participate in a tradition extending back through Comtian positivism and British empiricism.<sup>7</sup> The image detectors, though, were key to many of the breakthrough discoveries in physics from 1895 through the 1930s.

The possibility of visually experiencing an invisible world in the emerging physics of the 1890s and early twentieth century appealed to the Theosophical Society, which carefully followed the experimental and theoretical work of scientists such as Crookes, Sir William Ramsay, Wilhelm Conrad Röntgen, J.J. Thomson, Frederick Soddy, Ernest Rutherford, and Marie and Pierre Curie. Theosophists believed that the new science validated both the theories of medieval alchemists and, of course, the wisdom of Theosophical adepts, including the founders of the Society, Blavatsky and Olcott, and their Theosophical heirs, es-



Figure 3. Cover of *Lucifer* 1, 2 (October 1887).

pecially Annie Besant (1847–1933) and Charles Webster Leadbeater (1854–1934). Even more remarkably, Theosophical engagements with authorized science helped confirm the emerging “image orientation” of the new atomic science from the outset.

For the first two decades of the Theosophical Society’s existence, Theosophists’ written attempts to legitimate Theosophy as a science (to “sanitize” its occultism, to borrow Roy Wallis’s apt term) consisted of frequently citing scientific works and adopting scientific terms. But in 1895, the year in which Wilson built his first cloud chamber and Röntgen discovered X-rays, Besant and Leadbeater, both rising stars in the Theosophical firmament, shifted the terms of Theosophical sanitization and launched a series of direct experiments into the nature of the chemical elements. The results of these August 1895 investigations into the subatomic structure of hydrogen, oxygen, nitrogen, and a fourth gas—which, they claimed, had not yet been discovered by chem-

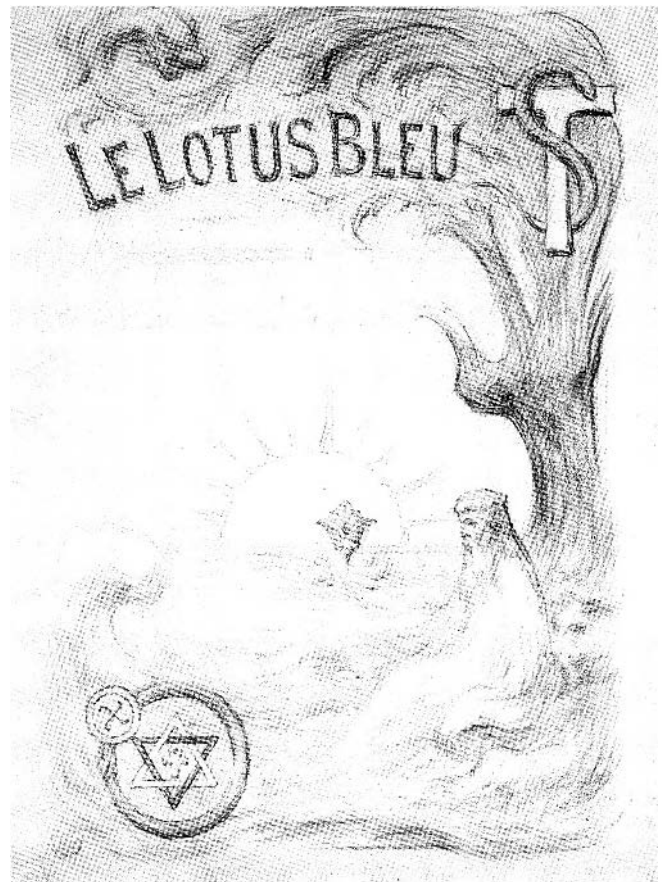


Figure 4. Claude-Émile Schuffenecker, *Le Lotus Bleu*, 1892. Black crayon on paper. 59.7 x 45.1 cm. Regina, Mackenzie Art Gallery, University of Regina Collection (Photo: Don Hall).

ists—were published in *Lucifer*, the major Theosophical journal founded by Blavatsky in 1887. They preceded the abstract visual marvels of *Thought-Forms* by six years and provided a micro-physical explanation of Theosophical tenets. Indeed, this move to experimental research profoundly shifted Theosophy’s visual culture away from the dreamy Symbolist aesthetics epitomized by *Lucifer*’s cover (fig. 3), or by the art work of Gauguin’s close friend Claude Emile Schuffenecker in the French journal *Le Lotus Bleu* (1892) (fig. 4), toward the abstraction of the “scientific” transcriptions in *Thought-Forms* (fig. 5) and the abstract geometries of *Occult Chemistry* (figs. 6, 7, 8, 9).

The clairvoyant chemistry experiments were resumed in 1907 with work on fifty-nine more elements. In the intervening years, of course, the discoveries of radioactivity, radium and other radioactive elements, the electron, and radioactive transformation had radically altered the field of atomic science.

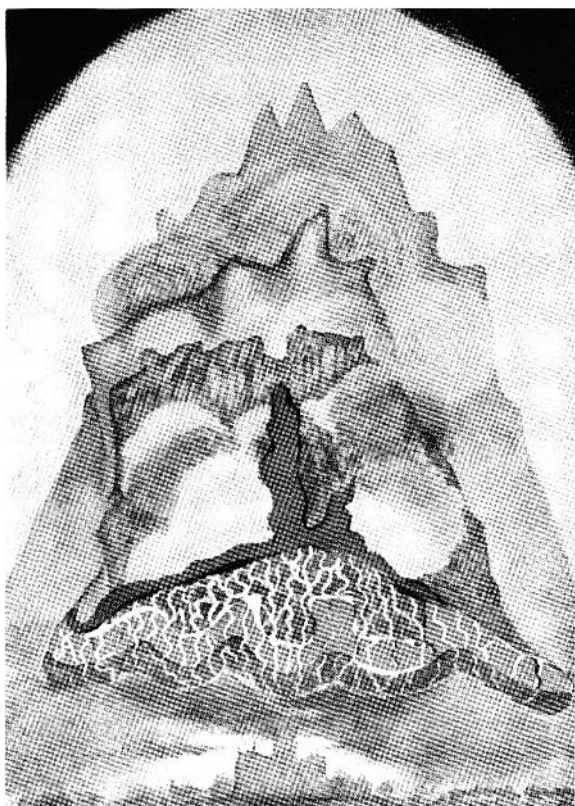


Figure 5. John Varley, Thought-form "seen" during performance of Wagner on a church organ. Reproduced from Annie Besant and C.W. Leadbeater, *Thought-Forms* (London, 1901), plate between pp. 62 and 63.

Indeed, on the very day (18 July 1907) that Sir William Ramsay published in *Nature* his remarkable (though ultimately mistaken) claim to have transmuted elements, Sir William Crookes was corresponding with Besant and Leadbeater about supplying them samples of the elements for their research.<sup>8</sup> Leadbeater and Besant continued their experiments that summer during a vacation in Weisser-Hirsch near Dresden, and they made use of the mineral specimens in a Dresden museum. The reinvigorated investigations continued intermittently until the deaths of Besant in 1933 and Leadbeater in 1934, and they resulted in a volume entitled *Occult Chemistry* that went through three editions (1908, 1919, and 1951) and remains in print today. Like much turn-of-the-century alchemical writing on chemistry, *Occult Chemistry* echoed Victorian scientists who had argued that the chemical elements described by Dalton must be composed of something simpler and unitary. Alchemists had called it the

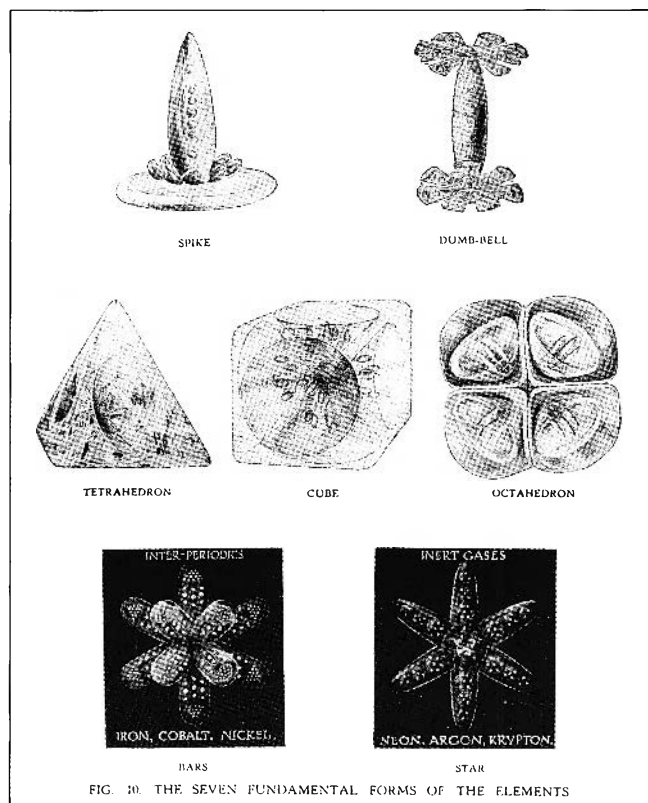


Figure 6. Elizabeth W. Preston, "The Seven Fundamental Forms of the Elements," in C.W. Leadbeater and Annie Besant, *Occult Chemistry: investigations by clairvoyant magnification into the structure of the atoms of the periodic table and of some compounds* (1908), 3rd ed. (Madras, 1951), between pp. 28 and 29. Reproduced with permission from The Theosophical Publishing House, Adyar, Chennai, India (© The Theosophical Publishing House, Adyar, Chennai-600 020, India, <http://www.ts-adyar.org>).

*prima materia*, or "first matter," while Kelvin had called it the vortex atom and Prout and Crookes had called it the protyle. Besant and Leadbeater called it the Ultimate Physical Atom, or "anu" (from Sanskrit).

Their experiments marked a significant shift from revelation to experimentation as a source for the scientific basis of Theosophy—a move intended to garner for Theosophy the validation of scientific method and the prestige of experimental science in that period. But the experiments were remarkable for another reason: they were conducted clairvoyantly. Besant and Leadbeater claimed that direct perception of subatomic structure was superior to the scientific data that could be gleaned from instrumentation. Or, to put it slightly differently, they posited the human observer as a kind of occult detection instrument. It is easy to be dismissive of these experiments: Peter Washington notes derisively, "Though the authors made several

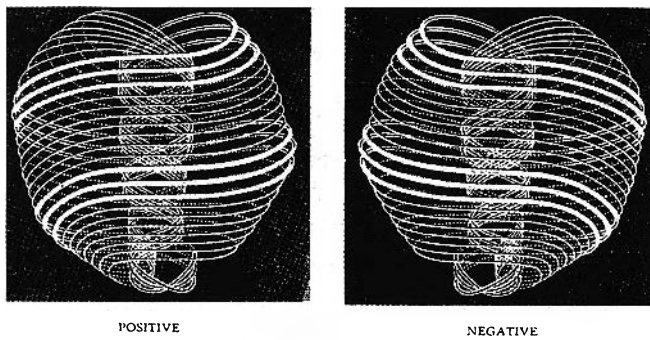


FIG. 3. "THE ANU"

Figure 7. Annie Besant [or based on the drawings of Annie Besant], Male and female (positive and negative) forms of the Ultimate Physical Atom (UPA), in C.W. Leadbeater and Annie Besant. *Occult Chemistry: investigations by clairvoyant magnification into the structure of the atoms of the periodic table and of some compounds* (1908), 3rd. ed. (Madras, 1951), p. 13. Reproduced with permission from The Theosophical Publishing House, Adyar, Chennai, India (© The Theosophical Publishing House, Adyar, Chennai-600 020, India, <http://www.ts-adyar.org>).

of their chemical discoveries while sitting on a bench in the Finchley Road, as so often in scientific research the right materials were not always to hand and Leadbeater had to make several astral visits to glass cases in museums where the rarer metals and minerals were housed.<sup>9</sup> Yet Besant and Leadbeater saw these experiments as important enough to continue across almost forty years of their lives and to publish in multiple book editions and journal articles. Their clairvoyant forays into the subatomic world speak to a number of important issues, including the relationship between spirituality and the materialist sciences of chemistry and physics of the period.

For Theosophists, the material realm of the subatomic world became available to aesthetic, sensuous—and even sensual—encounters. The unseen world was portrayed voluptuously; subatomic particles were seen not only as animate but also as sexed. The perceiving body became, in Theosophical conceptions, an instrument of scientific knowledge production rather than simply the subject of it.

### Theosophy and the Boundaries of Physical Science

The Theosophical Society, with its formal governance structure, its open and regular meetings, its public self-promotion, and its vast publishing industry, was a very different sort of occult enterprise from the secret Hermetic societies like the Golden Dawn and played a more prominent role in the public perception of occult subjects. Blavatsky, Olcott, and the early members of the Theosophical Society in America, Britain, and India

(where the two founders moved in 1878) created a flourishing spiritual movement and a publishing industry that publicized their beliefs in seven interpenetrating planes, each consisting of successively more rarified matter, with the material plane of our everyday existence and perceptions being the most dense. But all matter, in the Theosophical cosmos, is essentially living and spiritual and participates by emanation in a Universal Spirit. Moreover, all life forms and worlds are going through an evolutionary process, with the lower life forms' evolution being directed by more highly evolved spiritual beings.

The Theosophical movement built upon the energies of mid-nineteenth century spiritualism and the later Victorian occult revival. It also called upon the prestige of Victorian science, and it thrived on the cultural controversies caused by that science. Much of its success stemmed from Blavatsky's imaginative synthesis of Western occultism and Eastern religions, especially Buddhism, and her efforts to situate the new religion as essentially an ancient *science*. In *Isis Unveiled*, Blavatsky challenged what she saw as the narrow materialism of Darwin, Huxley, and recent science, but she also rejected the dogmas of Christianity and called for a wisdom that would unite science and religion.

In the early years of Theosophy, the modern science that most occupied the movement was actually the theory of evolution.<sup>10</sup> And while Blavatsky in *Isis Unveiled* and *Secret Doctrine* grappled in a limited way with modern physics and chemistry, she engaged much more fully with the work of alchemists, especially that of Paracelsus. The major events that launched modern particle physics—the discoveries of x-rays, the electron, radiation, radium, and radioactive decay—all occurred after Blavatsky died in 1891.

If Blavatsky meant to make Theosophy a science whose ultimate goal was spiritual wisdom, her methods of scientific engagement were beginning to show their limitations within a few years after her death. Her oracular style in *Secret Doctrine* allowed her to give precise details of the religious and philosophical tenets she was amassing from Buddhism, Hinduism, and Western occult traditions, yet her characterizations of the modern science that supposedly supported such thinking were always vague. She thus seemed persuasive primarily to those who already affirmed her occult authority. She usually offered direct quotations from works by scientists sympathetic to spiritual views of science.<sup>11</sup> While Blavatsky claimed that "Modern Science is every day drawn more into the maelstrom of Occultism,"<sup>12</sup> her facile invocations of modern science did not offer much to convince the skeptic.

Writers of later Theosophical publications paid attention to evolution, too, as well as to the "new astronomy" fueled by Norman Lockyer's spectroscopic analyses, work on the nature of life, and, emphatically, the new atomic physics and chemistry. This extended from Victorian challenges to the irreducible

multiplicity of Dalton's elements—Kelvin's vortex atom and Crookes's version of Prout's protyle enjoyed much discussion—to the latest work by J.J. Thomson, Rutherford, Ramsay, Soddy, and others on radioactivity. Moreover, the level of Theosophical engagement with physics and chemistry, as well as with the legacy of alchemy, increased dramatically in the late 1890s and into the early twentieth century, as evidenced by the frequent articles on the new physics and chemistry in the major Theosophical journals—*Lucifer*, *The Theosophical Review*, *The Theosophist*, and *The Theosophical Quarterly*—and book and pamphlet publication by the Theosophical Society Press.

*Lucifer* had been founded and edited by Blavatsky in 1887, with Besant joining as co-editor in 1890. (She remained after Blavatsky's death in 1891, and with her co-editor, G.R.S. Mead, she changed the name of the journal to *The Theosophical Review* in 1897.) Besant greatly intensified the journal's engagement with science after 1891. Her "On the Watch-Tower" column, which commenced in the March 1892 issue, served as a forum on news and articles from current newspapers and journals, and emphatically engaged the latest discoveries of laboratory work in chemistry and physics. Beyond the regular scientific coverage in "On the Watch-Tower," Besant and Mead frequently published articles with titles such as "Confirmation of Theosophy by Science," "Theosophy, the Religion of Science," "Science on the Borderland," and the like. Olcott's *Theosophist* and the American journal *The Theosophical Quarterly* also followed much of the science of the day, though they were less thorough in their coverage of science. In addition, books such as A. Marques's *Scientific Corroborations of Theosophy* and A.P. Sinnett's *Nature's Mysteries, and How Theosophy Illuminates Them* were published by the Theosophical Publishing House in Los Angeles and the Theosophical Publishing Society in London. Even if their interpretations of contemporary science might have surprised the scientists involved, the authors of these works greatly intensified Theosophy's investment in the laboratory work of the scientific establishment. They did not simply proclaim gems of occult wisdom gleaned from ancient sources, as Blavatsky had primarily done.

Annie Besant intended her article "Occult Chemistry," published in *Lucifer* on 15 November 1895, to stake a Theosophical claim on precisely this kind of laboratory work: "It seems worth while to lay before the public a few observations made through these [astral] senses, partly because it is possible that they may suggest hypotheses useful as elucidating some scientific problems; and partly because science is advancing rapidly and will ere long be investigating some of these matters for itself, and it will then perhaps be well for the Theosophical Society if the first statement of facts that will then be accepted should have come from members of its body."<sup>13</sup> Without even identifying herself and Leadbeater as the "mem-

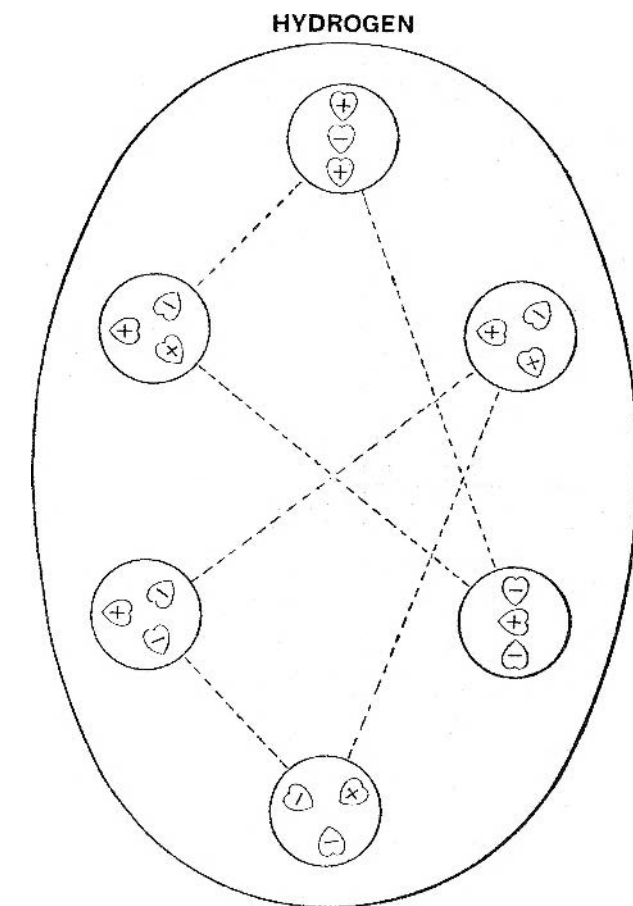


FIG. 1. HYDROGEN

Figure 8. Elizabeth W. Preston, Subatomic structure of hydrogen, in C.W. Leadbeater and Annie Besant, *Occult Chemistry: investigations by clairvoyant magnification into the structure of the atoms of the periodic table and of some compounds* (1908), 3rd. ed. (Madras, 1951), p. 11. Reproduced with permission from The Theosophical Publishing House, Adyar, Chennai, India (© The Theosophical Publishing House, Adyar, Chennai-600 020, India. <http://www.ts-adyar.org>).

bers" who had conducted the experiments, Besant—clearly understanding the conventions of scientific publication—meant this first publication of preliminary results to establish precedent over any subsequent scientific discoveries about subatomic physics.<sup>14</sup>

#### Direct Visual Perception versus Instrumentation

While electronic counting detectors played a role in early twentieth-century atomic physics, the image tradition that Galison identifies was crucial to many of the major discoveries and in-

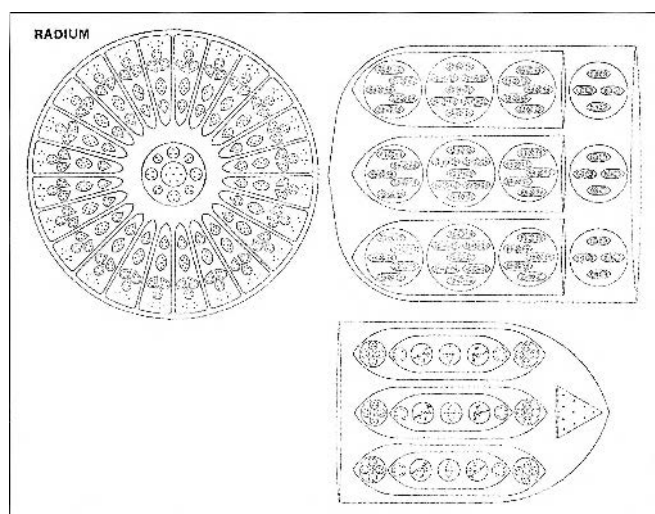


Figure 9. Elizabeth W. Preston, Subatomic structure of radium, in C.W. Leadbeater and Annie Besant, *Occult Chemistry: investigations by clairvoyant magnification into the structure of the atoms of the periodic table and of some compounds* (1908), 3rd. ed. (Madras, 1951), p. 104. Reproduced with permission from The Theosophical Publishing House, Adyar, Chennai, India (© The Theosophical Publishing House, Adyar, Chennai- 600 020, India, <http://www.ts-adyar.org>)

terpretations of the field. To cite one particularly famous example—one that the press widely cited as modern alchemy’s first successful artificial transmutation—in 1919 Rutherford bombarded nitrogen with fast alpha particles, producing a heavy isotope of oxygen. As Galison explains, Rutherford used a scintillation detector to detect the protons emitted during the experiment, but because the flashes of light produced could not tell him any of the details of the actual process, he interpreted it as one of disintegration. But when Rutherford and P.M.S. Blackett conducted the experiment using a cloud chamber to allow them to *see* the tracks of the particles, they not only discovered evidence of nitrogen’s transmutation, but also found that Rutherford had misinterpreted the process. Blackett could see the tracks left by the interaction, which showed the *integration* of particles.<sup>15</sup>

But if new instruments such as the spectroscope, cloud chamber, ionization chamber, and the Dolezalek electrometer allowed Thomson, Rutherford, and others to infer the existence of subatomic particles, the limitations of those instruments were obvious. Of course they could never allow scientists to perceive an atom, much less an electron, directly—the relationship between the body and mind of the observer and the object of observation was always essentially secondhand.

Leadbeater and Besant’s occult chemistry clearly participated in such privileging of visual data, but they frequently claimed

that their clairvoyant extension of physical sight was more accurate than scientific instruments could allow. They wrote, “We put [our observations] forward in the hope of stimulating work along this line, and of thus bringing to science, when its instruments fail it, the old, old instrument of enlarged human vision.”<sup>16</sup> Beyond the issue of mere accuracy, the very nature of the relationship between the perceiving body and the object of perception was the central focus of their pursuit of the ultimate physical atom.

When Leadbeater wrote about “magnifying clairvoyance,” the tensions between competing conceptions of the body—as instrument or as living perceiver—were evident. He grasped for ways of articulating the experience of this magnifying clairvoyance. In his book *The Chakras* (1927), he writes as if the body were both an organic sensor and an inorganic instrument:

The centre between the eyebrows is connected with sight in yet another way. It is through it that the power of magnification of minute physical objects is exercised. A tiny flexible tube of etheric matter is projected from the centre of it, resembling a microscopic snake with something like an eye at the end of it. This is the special organ used in that form of clairvoyance and the eye at the end of it can be extended or contracted, the effect being to change the power of magnification according to the size of the object which is being examined.<sup>17</sup>

The faculty is described here in organic as well as in non-organic terms, as if it were an instrument in a laboratory—a “flexible tube” made of ether whose power to magnify can be adjusted by mechanical extension or contraction. (Note even here that the “lens” one might expect on a tube has been figured as an eye, an organ.)

Theosophical conceptions of clairvoyance were always vexed by a tension between naturalizing clairvoyance as simply a use of sense faculties that all humans possess (and can develop) versus perceiving the act as the construction of a hybrid human/nonhuman instrument. This uneasiness fundamentally derived from the position of the observer in relationship to the observed. In his 1899 book *Clairvoyance*, Leadbeater relentlessly searches for instruments by which to describe the act of clairvoyance. He describes, in three pages, one method of clairvoyance by astral current in terms of four different instruments: “the erection of a kind of temporary telephone though [astral matter]”; “polarization, by an effort of the human will, of a number of parallel lines of astral atoms reaching from the operator to the scene which he wishes to observe”; making “a telegraph line”; and “manufactur[ing] for himself a temporary astral telescope.”<sup>18</sup> The opposite faculty, “magnifying at will the minutest physical or astral particle to any desired size,” was described again in terms of an instrument: “as though by a microscope—though



no microscope ever made or ever likely to be made possesses even a thousandth part of this psychic magnifying power.”<sup>19</sup>

Yet this astral or ethereal hybrid—the human with an ethereal microscope tube growing from his forehead, or with an astral telescope tube or telegraph wire extending from his body across space—was also given a more organic explanation. The clairvoyant was simply practising a Yogic *siddhi*, a special power attained through advanced training (in this case, “the power of making oneself large or small at will”).<sup>20</sup> This allowed the Yogi to become enormous, to fill the whole universe and essentially be everywhere, or to become microscopically small, to perceive atoms or even subatomic particles directly by being inside or among them at the micro-level. But, as Leadbeater explains, “the alteration in size is really in the vehicle of the student’s consciousness”—it is the “breadth of one’s view” that changes.<sup>21</sup> Leadbeater’s Singhalese pupil Curupumullage Jinarajadasa (who later would become President of the Theosophical Society) was with Leadbeater and Besant as they astrally travelled across space to other planets (and even claimed to have found four unknown planets in the solar system) and as they conducted their clairvoyant chemistry. He described the experimenters as if they were scientists in a laboratory, but scientists without the need of instruments:

When using this method the investigator is awake and not in any form of trance. He employs his usual faculties for recording what he observes; he maps out on a piece of paper a sketch of what he sees and may describe his impressions so that a stenographer can take down his remarks. Just as a microscopist, looking into the microscope and without removing his eyes from the slide, can describe what he observes so that it can be recorded, so the clairvoyant investigator watching an atom or molecule can describe what he sees in front of him. What he sees is not subjective, in the sense that it is a creation of the imagination; it is as objective as is the paper on which I am writing this and the pen which I use.<sup>22</sup>

The direct experience account, that of the clairvoyant investigator changing his or her perspective to the micro-size of the atom and experiencing it as if simply watching with physical eyes, ultimately won out, becoming the oft-repeated explanation used later by supporters of occult chemistry (Jinarajadasa, and the scientists E. Lester Smith and Stephen Phillips). Significantly, this interpretation emphasized the organic nature of the expanded human, conscious perceiver and ultimately strengthened the vitalist nature of Theosophical cosmology.

### Theosophical Atoms

But in spite of Theosophical vitalism (to which I shall return below) and the Theosophical attack on mechanistic science and

philosophy, the atomic theory Besant and Leadbeater developed in *Occult Chemistry* and elsewhere was in many ways a mechanical theory involving interactions of ever-more rarified particles and their vibrations. It adapted many assumptions of Victorian ether mechanics.

The model of the atom that Besant and Leadbeater constructed in *Occult Chemistry* claimed the existence not just of four states of physical matter—solid, liquid, gaseous, and an etheric state that some Victorian physicists were willing to see as another form or state of matter—but, in fact, of seven. They accepted solid, liquid, gaseous, and four etheric states, which they tied to the Theosophical subplanes of Ether1–Ether4. Matter in each of these states is composed of aggregates of particles in geometrical configurations. The chemical elements, according to Besant and Leadbeater, can be arranged into periodic groups according to the forms they share: “spike,” “dumb-bell,” “tetrahedron,” “cube,” “octahedron,” “crossed bars,” and “star” (fig. 6). As the clairvoyant chemist breaks down the walls holding the geometrical configurations of particles together, each atom dissociates into yet more basic particles specific to the etheric subplane. Finally, the ultimate physical atom (or UPA, as I shall abbreviate it) was the only particle on the E1 etheric subplane, and it existed in two forms, male and female (fig. 7). In Besant and Leadbeater’s system, the UPA cannot be further dissociated and remain physical matter; the more rarified particles into which it would dissociate would be astral particles. The UPAs are formed of ten “whorls,” each twisted as a spiral containing 1,680 turns. Each, in turn, contains seven finer whorls called “spirillae.” The distinction between male and female forms of the UPA consists of the way force flows through each. Besant and Leadbeater defined the difference this way:

In this ultimate state of physical matter two types of atoms have been observed; they are alike in everything save the direction of their whorls and of the force which pours through them. In the one case force pours in from the “outside,” from fourth-dimensional space [the astral plane] and passing through the atom, pours into the physical world. In the second, it pours in from the physical world, and out through the atom into the “outside” again, i.e., vanishes from the physical world. The one is like a spring, from which water bubbles out; the other is like a hole, into which water disappears.<sup>23</sup>

More on this force and the gendering of UPAs in a moment. Besant and Leadbeater based much of this understanding of physics on the ether hypothesis that was commonly accepted until Einstein and others rejected it in the early twentieth century. But Besant and Leadbeater created an even more complex system of atoms. The schema extended to all seven planes

posited by Theosophy. Leadbeater, in his *Textbook of Theosophy* (1925), had categorized the seven planes. The first world is a “divine world” with which humans had as yet no direct contact; the second “monadic” world contains the “Sparks of divine Life” and is also beyond the reach of the clairvoyant; the third is the “spiritual world”; the fourth is an “intuitional world,” or “buddhic plane,” from which “come the highest intuitions”; the fifth is a “mental world,” from whose matter “is built the mind of man”; the sixth is an “emotional or astral world,” thus named “because the emotions of man cause undulations in its matter”—and called “astral,” they wrote, by “medieval alchemists, because its matter is starry or shining as compared to that of the denser world”—and, finally, the seventh is the “physical” world, “composed of the type of matter which we see all around us.”<sup>24</sup> Leadbeater and Besant both emphasized in their writings that these worlds were co-extensive with one another, that they were merely composed of different, increasingly rarified, forms of matter. And as Besant emphasized in *The Ancient Wisdom* (1897), her major contribution to making a working system from the vast sprawl of Blavatsky’s tomes, humans have existences in these other planes. Each person possesses, for instance, an astral body that coexists with the physical one. The senses appropriate to these other states of matter, however, were largely underdeveloped.

#### The “Unimaginable Beauty” of a Subatomic World

According to Besant and Leadbeater, each of the beings existing in the different planes has a fully developed set of sense faculties by which to apprehend only the forms of matter on that plane. But, Besant and Leadbeater argued, beings can develop the sense faculties appropriate to other planes.<sup>25</sup> These leading Theosophists tended to emphasize the voluptuousness of these other senses in aesthetic terms. As Besant noted in her discussion of the development of sense organs in *The Ancient Wisdom*, “Even now there are myriads of vibrations pulsing around us in physical nature from the knowledge of which we are shut out because of the inability of our physical vehicle to receive and vibrate in accord with them. *Unimaginable beauties*, exquisite sounds, delicate subtleties, touch the walls of our prison house and pass on unheeded.”<sup>26</sup> Leadbeater gushed that “one curious and very beautiful novelty brought to his notice by the development of this [astral] vision would be the existence of other and entirely different colours beyond the limits of the ordinarily visible spectrum, the ultra-red and ultra-violet rays which science has discovered by other means being plainly perceptible to astral sight.”<sup>27</sup> The experience of the subatomic world of UPAs is one of almost sensory overload: “In the three whorls flow currents of different electricities; the seven vibrate in response to etheric waves of all kinds—to sound, light, heat, etc.; they show

the seven colours of the spectrum; give out the seven sounds of the natural scale; respond in a variety of ways to physical vibration—flashing, singing, pulsing bodies, they move incessantly, inconceivably beautiful and brilliant.”<sup>28</sup>

The UPA itself is shaped like the Western symbol for the heart (a “heart-like form”), and in the schematic drawings of the different configurations of UPAs, they are drawn explicitly in a heart shape and are described as having “a regular pulsation, a contraction and expansion, like the pulsation of the heart.”<sup>29</sup> The diagrams of the subatomic structure of the elements are themselves of aesthetic interest, ranging from the fairly simple structure of hydrogen (fig. 8) to the complex patterning of radium (fig. 9). Moreover, the movements and vibrations of UPAs are frequently described in anthropomorphic terms: the UPA “sings” and it “dances up and down, flings itself wildly from side to side, performs the most astonishing and rapid gyrations.”<sup>30</sup> The molecules composed of UPAs “turn head over heels and gyrate in endless ways” and are contained in their shapes by “cell-walls.”<sup>31</sup>

The sexing of UPAs as male and female, with the traditional positive/negative characterization of the genders, makes the essence of matter a kind of subatomic sexual intercourse. Opposites attract and infuse each other with lines of life force pulsing in and out of them. While Theosophy has often been seen as preoccupied with spiritualizing the body, and Blavatsky herself had exclaimed that “the absolutely spiritual Man is... entirely disconnected from sex,”<sup>32</sup> a generative and sexed universe was key to much Theosophical writing. Besant herself gave up her strong advocacy of birth control when she entered the Theosophical Society because of its emphasis on procreative sex.<sup>33</sup> Moreover, as Dixon has persuasively argued, Besant and Leadbeater’s version of Theosophy (referred to as “neo-Theosophy” by some critics), which insisted on tracing past lives in the Theosophical system of reincarnation, involved members in a complicated lattice of past lives of different genders.<sup>34</sup>

The sexing of the subatomic world, and Besant and Leadbeater’s frequent descriptions of it in bodily metaphors served to reinforce the vitalism that undergirded what was otherwise a mechanical system of particle interactions. As Hermeticists might argue, the interactions of the physical world mirrored the workings of the spiritual world. Besant and Leadbeater’s efforts to create an experimental science of particle interactions required these biological, vital metaphors in order to strengthen the role of the human mind and soul and the life force of a deity in a world of particle configurations.

## Instrumentation and the Rhetorical Quandary of Occult Chemistry

In *Science in Action*, Bruno Latour defines an instrument or inscription device as “any set-up, no matter what its size, nature and cost, that provides a visual display of any sort in a scientific text.” Instruments, he argues, provide an “other world just beneath the text”—a world that is “invisible as long as there is no controversy.”<sup>35</sup> Both the instruments and the visual displays they produce are rhetorical tools to persuade, to strengthen a fact, in Latour’s analysis: “Going from the paper to the laboratory is going from an array of rhetorical resources to a set of new resources devised in such a way as to provide the literature with its most powerful tool: the visual display.”<sup>36</sup> What would it take to challenge a scientist’s findings, to undermine the persuasiveness of the visual image—the chart or graph or photo that encapsulates his interpretation of his experiment? Going to a library and looking at other books or articles will not suffice, Latour notes. One would need to be able to acquire the laboratory space and all the requisite instruments, and the technicians to use them, even to begin to refute a claim. Instruments and visual displays thus serve very powerful rhetorical ends. They are integral parts of the networks of actors scientists enlist to create and strengthen a “fact.”

So what did Besant and Leadbeater accomplish by themselves becoming the instruments of their experiments? In many ways they played the game of scientific knowledge production astutely. They produced compelling and clear visuals: they drew the particle configurations they observed as they observed them, and they enlisted colleagues and artists to produce them in the most legible and impressive fashion. They cited scientific work on the subject by the well-respected Sir William Crookes and showed how their efforts related to his conception of the table of periodic elements. They clearly worked within the frameworks of ether physics that the Victorian period had provided for them. They obtained most of the requisite materials for their work, samples of the elements and compounds, from legitimate sources. They were precise in their mathematical calculations (of atomic weights, for instance). And in their writings, they frequently called for the very thing that science required: reproducibility of results.

Moreover, the larger vision of further states of increasingly rarified matter beyond even the ether—the nature of the other planes in Theosophy—and, above all, the *mode* of perceiving them, if accepted from the experimental data, rhetorically strengthened the persuasiveness of the spiritual system based upon them, including the Theosophical conceptions of reincarnation, astral states, and the nature of the soul and body. By taking the seemingly small step of modifying a current strand of fundamental particle theory, therefore, Besant and Leadbeater

helped generate the “scientific” basis for the entire Theosophical system. Indeed, the move to posit the mind and body as the perceiving instrument, a radical intervention into sensory issues of instrumentation, was even more important than the claims about the nature of fundamental particles: if the body *can* perceive in this way, Theosophical physics *must* be scientifically correct.

Yet it is on the issues of reproducibility and instrumentation that *Occult Chemistry* failed to persuade, at least outside of Theosophical circles and that of the few scientists in recent years who have been willing to work entirely at the level of theory. Besant and Leadbeater could move beyond older models of science, based on deductions from revealed principles (alchemical or scientific deductions from the writings of the Hermetic tradition, for instance, or from the revelations of H.P. Blavatsky), by turning to experimentation. Not surprisingly, their form of experimentation did not admit of reproducibility. In spite of efforts by Stephen Phillips to conduct blind trials using a Buddhist clairvoyant to confirm Besant and Leadbeater’s micropsi visions, direct experience is neither convincingly verifiable nor falsifiable.<sup>37</sup>

Ultimately, Besant and Leadbeater’s Theosophical cosmology, and its affirmation in their clairvoyant chemistry, offered believers a vision of a spiritual experience that was also a sensory experience of a material world—in essence, a scientific experience subject to rules of the functioning of particles and the evolution of matter. Besant and Leadbeater explained the different planes and their constituents in terms of ever more rarified particles, each of which had a sensory apparatus appropriate to it and was endowed with a life principle. Through *Occult Chemistry*, these Theosophists attempted to bridge a divide, one expressed so urgently in the turn of the century world, between religion and material science. They did so by synthesizing sensuous and even aesthetic apprehension with the language of instrumentation—and in so doing, worked to re-enchanted scientific experiment itself. The legacy of this move, though, has not been as much scientific as aesthetic. Both clairvoyants soon turned their attention to *Thought-Forms*, the “scientific” record of experimental research into the remarkable abstract shape and colour correspondences that inspired Kandinsky and other modern artists.

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to reproduce images from Annie Besant and C.W. Leadbeater's *Occult Chemistry*.

## Notes

- <sup>1</sup> See, for example, Sixten Ringbom, "Art in 'The Epoch of the Great Spiritual': Occult Elements in the Early Theory of Abstract Painting," *Journal of the Warburg and Courtauld Institutes* 29 (1966): 386–418. František Kupka and Piet Mondrian were also abstract artists who were interested in Theosophy. See Robert P. Welsh, "Sacred Geometry: French Symbolism and Early Abstraction," in *The Spiritual in Art: Abstract Painting, 1890–1985* (Los Angeles, 1986), 63–87.
- <sup>2</sup> Outside of scholarship on Kandinsky, Linda Dalrymple Henderson has insightfully documented the impact on modern art of other confluences of science and occultism during the period. See *The Fourth Dimension and Non-Euclidean Geometry in Modern Art* (Princeton, 1983), and *Duchamp in Context: Science and Technology in the Large Glass and Related Work* (Princeton, 1998).
- <sup>3</sup> See William H. Brock, *From Protyle to Proton: William Prout and the Nature of Matter, 1785–1985* (Bristol and Boston, 1985).
- <sup>4</sup> A more developed and differently focused version of this essay will appear in my monograph, *Modern Alchemy: Occultism and the Emergence of Atomic Theory*, forthcoming from Oxford University Press. Elements of this essay are used by permission of the press.
- <sup>5</sup> Historians of science and science studies theorists such as Peter Galison, Bruno Latour, Allan Franklin, Timothy Lenoir, and Homer Le Grand have in the past few decades begun to examine the relationships among instrumentation, experimentation, and conceptual models, and have provided increasingly nuanced accounts of the role of instrumentation in the emergence of and shifts in scientific theory.
- <sup>6</sup> Peter Galison, *How Experiments End* (Chicago, 1987), 248–49.
- <sup>7</sup> Peter Galison, *Image and Logic: A Material Culture of Microphysics* (Chicago, 1997), 11.
- <sup>8</sup> Annie Besant and Charles W. Leadbeater, *Occult Chemistry: A Series of Clairvoyant Observations on the Chemical Elements* (Adyar, India, 1951), 2. The first edition was published in London and Benares by the Theosophical Publishing Society, 1908.
- <sup>9</sup> Peter Washington, *Madame Blavatsky's Baboon: A History of the Mystics, Mediums, and Misfits Who Brought Spiritualism to America* (New York, 1995), 120.
- <sup>10</sup> As Washington puts it in *Madame Blavatsky's Baboon*, "Olcott compared Blavatsky with Darwin, and [*Isis Unveiled*] is a deliberate challenge to that master, whose evolutionary theory she trumps by asserting that the evolution of monkeys into men is merely one stage in a long chain which allows men to evolve into higher beings. Blavatsky thereby transforms evolution from a limited socio-biological theory into an explanation of everything from atoms to angels. Instead of opposing religion with the facts as presented by Victorian science, she attempts to subsume those facts into a grand synthesis that makes religious wisdom not the enemy of scientific knowledge but its final goal" (p. 52).
- <sup>11</sup> In *Isis Unveiled*, for instance, she drew from Balfour Stewart and P.G. Tait's *The Unseen Universe* (1875), a book in which two eminent figures in the development of classical thermodynamics found religious doctrine supported by the physics of energy and ether. (Victorian physics presupposed a physical, but massless, medium, the ether, through which electromagnetic waves propagated.) And in *The Secret Doctrine*, Blavatsky drew from the work of Sir William Crookes, himself a Theosophist—and she always quoted Crookes at his most speculative. For example, she quotes Crookes's assertions of vitalism at the chemical level as an antidote to the heat-death of the universe that seemed to be entailed by the 2nd Law of Thermodynamics (*Secret I*, 603), or second-hand accounts of his lectures on the protyle, with assertions of its similarity to thinking in the Bhagavad Gita (*Secret I*, 681).
- <sup>12</sup> H.P. Blavatsky, *The Secret Doctrine: The Synthesis of Science, Religion and Philosophy*, 2 vols. (1888; repr. London, 1928), I, 149.
- <sup>13</sup> Annie Besant, "Occult Chemistry," *Lucifer* 17, no. 99 (15 November 1985): 211.
- <sup>14</sup> There were a few disagreeable facts to sidestep. As Stephen Phillips notes, Leadbeater had developed his clairvoyance in only forty-two days rather than in a lifetime of study and discipline. See Stephen Phillips, *ESP of Quarks and Superstrings* (New Delhi, 1999), 5. And, as Washington puts it in *Madame Blavatsky's Baboon* (p. 120), Besant's "hitherto limited psychic gifts had expanded overnight as a result of meeting Leadbeater." Moreover, Besant and Leadbeater, who had initially worked individually on their clairvoyant explorations of the elements, had to work together because they kept seeing the elements differently. As Gregory Tillett notes in *The Elder Brother: A Biography of Charles Webster Leadbeater* (London, 1982) (p. 94), Besant and Leadbeater explained these discrepancies by asserting that Besant had been viewing the elements sideways, while Leadbeater had viewed them from the top. Still, Besant and Leadbeater's clairvoyant powers—and the vitalist particle cosmology that undergirded them—were given increasing scientific justification in the Theosophical journals as Theosophists could augment the mysterious powers of the ether from Victorian physics with the new atomic physics of radioactivity.
- <sup>15</sup> Galison, *Image and Logic*, 119.
- <sup>16</sup> Besant and Leadbeater, *Occult Chemistry* (1908), 2.
- <sup>17</sup> Quoted in Phillips, *ESP*, 5–6.
- <sup>18</sup> C.W. Leadbeater, *Clairvoyance* (London, 1899), 55–57.
- <sup>19</sup> Leadbeater, *Clairvoyance*, 42.
- <sup>20</sup> Leadbeater, *Clairvoyance*, 42.
- <sup>21</sup> Leadbeater, *Clairvoyance*, 43.
- <sup>22</sup> Besant and Leadbeater, *Occult Chemistry* (1951), 1.
- <sup>23</sup> Besant and Leadbeater, *Occult Chemistry* (1908), 5.

- <sup>24</sup> C.W. Leadbeater, *A Textbook of Theosophy* (1912; 11th ed., Adyar, India, 1971), 23.
- <sup>25</sup> Leadbeater, *Textbook*, 25–26.
- <sup>26</sup> Annie Besant, *The Ancient Wisdom: An Outline of Theosophical Teachings* (1897; repr. London, 1906), 53. Emphasis mine.
- <sup>27</sup> C.W. Leadbeater, *The Astral Plane: Its Scenery, Inhabitants, and Phenomena* (5th ed., Los Angeles, 1918), 23–24.
- <sup>28</sup> Besant and Leadbeater, *Occult Chemistry* (1908), 7.
- <sup>29</sup> Besant and Leadbeater, *Occult Chemistry* (1908), 5, 7.
- <sup>30</sup> Besant and Leadbeater, *Occult Chemistry* (1908), 7.
- <sup>31</sup> Besant and Leadbeater, *Occult Chemistry* (1908), 9.
- <sup>32</sup> Quoted on p. 418 in Joy Dixon, “Sexology and the Occult: Sexuality and Subjectivity in Theosophy’s New Age,” *Journal of the History of Sexuality* 7, no. 3 (1997): 409–33.
- <sup>33</sup> Dixon, “Sexology,” 432.
- <sup>34</sup> It even came to participate in sexological discussions of gender and sexual orientation, exploring “intermediate genders” and offering an alternative to Freud’s account of psycho-sexual dynamics. As Dixon puts it, “By locating these relationships [from a long series of past lives] not only in distant times but also in distant places, these writers created an imaginary space in which the boundaries imposed by bourgeois norms could be transgressed with apparent impunity.” She adds, “Where sexologists tended to conflate gender identity and sexual identity, the experiences of their Theosophical readers pointed to the inadequacies of such an analysis.” Yet Dixon observes the gender essentialism of Theosophical reincarnation accounts. Dixon, “Sexology,” 427, 428, 431.
- <sup>35</sup> Bruno Latour, *Science in Action: How to Follow Scientists and Engineers through Society* (Cambridge, Mass, 1987), 68, 69.
- <sup>36</sup> Latour, *Science*, 67.
- <sup>37</sup> Stephen Phillips, *Evidence of a Yogic Siddhi. Anima. Remote Viewing of Subatomic Particles* (Wheaton, Ill., 1996), 48.