

TECHNISCHE UNIVERSITÄT BERLIN

Fakultät I - Geistes- und Bildungswissenschaften

Institut für Philosophie, Literatur-, Wissenschafts- & Technikgeschichte

Hauptseminar Zauber der Materie (WS 2020/21)

**“MAGIC AS THE FOUNDATION OF CAUSALITY:**

**The roots of alchemy and science according to the anthropological tradition  
and the philosophy of Hegel”**

Verfasser: Dr. Thiago Ferreira Lion, M. N.  
0460886, [thiagoflion@hotmail.com](mailto:thiagoflion@hotmail.com), M. A.  
Theorie und Geschichte der Wissenschaft und  
Technik, Erste Semester.

Lehrperson: Dr. Tania Becker und Dr. Zornica  
Kirkova.

27 April 2021

## Magic as the Foundation of Causality:

### The roots of alchemy and science according to the anthropological tradition and the philosophy of Hegel.

This work departs from the commonly accepted concept of alchemy as an ‘embryonic science’ to then analyze what is its mystical side, the part in it that would be opposed to science, which we deal with here under the name of *magic*. Through the exposition of the theory of great exponents of the anthropological lineage such as James Frazer, Marcel Mauss and Claude Lévi-Strauss, magic is presented not as mere mysticism, but as positing the notion of causality. It is also revealed that effectiveness, far from being something foreign to magical thinking, constitutes its object, and that the difference between magic and science is much less clear than commonly imagined. In a similar sense to that of anthropology, we present Hegel's theory of magic. The philosopher understands it as the first form of the spiritual rule over nature, the gateway through which everything in the world is related acquiring meaning. As ballast that reinforces the arguments presented by these authors, we bring, on the side of modern science, arguments made by one of its most prestigious theorists, Thomas Kuhn.

Key Words: Magic, alchemy, science, anthropology, Frazer, Mauss, Lévi-Strauss, Hegel, Kuhn.

\*\*\*

In the term "alchemy" in the *Encyclopedia of Religion*, written by Allison Coudert, is possible to read about its relation to modern science, that "historians of science have studied alchemy as a photochemistry, that is, an embryonic science"(COUDERT, 2005, p. 234) but that "the methods, the ideology, and the goals of the early chemists did not prolong the alchemical heritage. The alchemists were not interested—or only subsidiarily—in the scientific study of nature" (2005, p. 235). Their interests were “quest for a means of transmuting base metals into gold, for a universal cure, and for the “elixir of immortality”” (2005, p. 234). Researchers of alchemy<sup>1</sup>, as also the writer of the term in the *Encyclopedia of Religion*, concludes then that the alchemists’ quest "was not scientific but spiritual"(COUDERT, 2005, p. 235). An important aim of this paper is to show that this apparently clear distinction between scientific and spiritual is

---

<sup>1</sup> As for instance, Sheppard, that says that “it must be realized that the goal of the alchemist was not chemical but rather spiritual transcendence” (SHEPPARD, 1985, p. 34) and again “Assuredly, both were applying chemical substances and processes towards what must be recognized as spiritual ends” (SHEPPARD, 1985, p. 36).

somewhat arbitrary<sup>2</sup>, that it doesn't stand on a solid basis, but appeals to prejudices of our current common sense.

If alchemy is understood as the beginning of science, it is because it is seen as still mixed with a mystical component, which can be generally called 'magic'. Alchemy would then be the intermediary state between ineffective superstition, purely mystical thinking, and science, knowledge experimentally reproducible, able of producing real effects. In this paper we will complicate this schematic representation, mainly by discussing *what magic is*. In order to do this, we will briefly follow the great lineage of anthropologists that studied magic in many different tribal societies, namely James Frazer, Marcel Mauss and Claude Lévi-Strauss. After that it will be presented how the German philosopher Georg W. F. Hegel anticipated many central aspects of the anthropological analysis. The exposition of this theories should enable us not only to take a different look at what is alchemy, but also what is science. In order to defend our conclusions by the side of scientific research, we will bring the approach to science developed by Thomas Kuhn.

### **Frazer and the differentiation between science and magic as a question of legitimacy**

James Frazer, one of the founding fathers of anthropology, in 1890 wrote about magic in his magnum opus *The Golden Bough* (1917, p. 220), that:

Its fundamental conception is identical with that of modern science; underlying the whole system is a faith, implicit but real and firm, in the order and uniformity of nature. The magician does not doubt that the same causes will always produce the same effects, that the performance of the proper ceremony, accompanied by the appropriate spell, will inevitably be attended by the desired results, unless, indeed, his incantations should chance to be thwarted and foiled by the more potent charms of another sorcerer"

This faith in the uniformity of nature is, for Frazer, already the basis of human thought. The idea of this uniformity is identical to the one of science, and, as we will show, it brings the notion of causality enabling the creation of a knowledge system. For now, let us continue with

---

<sup>2</sup> Even more nuanced distinctions, as the ones made by Mircea Eliade, seems to have a clear distinction between spiritual and scientific as background: "As far as the Indian alchemist is concerned, operations on mineral substances were not, and could not be, simple chemical experiments. On the contrary, they involved his karmic situation; in other words, they had decisive spiritual consequences. It is only when mineral substances have been emptied of their cosmological virtues and have become inanimate objects that chemical science proper becomes possible. Such a radical change of perspective would permit the constitution of a new scale of values and would render possible the appearance (that is, observation and recording) of chemical phenomena". (The Forge..., p. 141).

Frazer's comparison between magic and science. In order to operate with magic and to gain control over nature, in his view the magician is not free, but like in a technique he needs to follow the correct steps (FRAZER, 1917, p. 222):

His power, great as he believes it to be, is by no means arbitrary and unlimited. He can wield it only so long as he strictly conforms to the rules of his art, or to what may be called the laws of nature as conceived by him. (...) Thus the analogy between the magical and the scientific conceptions of the world is close. In both of them the succession of events is perfectly regular and certain, being determined by immutable laws, the operation of which can be foreseen and calculated precisely; the elements of caprice, of chance, and of accident are banished from the course of nature.

Nature is already in magic perceived as a realm of immutable laws. If that is true, so what is for Frazer the difference between magic and science? (1917, p. 223):

The fatal flaw of magic lies not in its general assumption of a sequence of events determined by law, but in its total misconception of the nature of the particular laws which govern that sequence. If we analyze the various cases of sympathetic magic which have been passed in review in the preceding pages, and which may be taken as fair samples of the bulk, we shall find, as I have already indicated, that they are all mistaken applications of one or other of two great fundamental laws of thought, namely, the association of ideas by similarity and the association of ideas by contiguity in space or time.

In alchemy one can see even both of the laws (association by similarity and by contiguity in space or time) interconnected, as in the example of an alchemical lab given by N. Silvin (Apud SHEPPARD, 1985, p. 2):

The laboratory preparation of an elixir was essentially the simulation of the Cosmic process by which it was produced naturally; 'they not only shrank the dimensions of the universe to fit the confines of their four walls, but compressed time as well to make the duration of their manipulations feasible'.

The laboratory is conceived as representing the cosmos, it is made similar to it, so by this identification it is possible to manipulate time and space - the contiguous elements acting on the material - to produce the elixir<sup>3</sup>. Apart from what we perceive as a mystical tone and mistaken applications of the association of ideas in singular alchemical experiments, is this general form not the same present in a laboratory today? In order to answer that, let us consider how M. Eliade (1978, p.147-148) defends the argument that Greek alchemy is fundamentally different from science:

What strikes us when we read the texts of the Greek alchemists is their lack of interest as far as physicochemical phenomena are concerned, in other words, the absence of the scientific

---

<sup>3</sup> Similar point is made by the *Enciclopedia of Religion* (COUDERT, 2005, p. 236) "man, with his various techniques, gradually takes the place of time: his labors replace the work of time".

spirit. As Sherwood Taylor remarks: 'No one who had used sulphur, for example, could fail to remark the curious phenomena which attend its fusion and the subsequent heating of the liquid. Now while sulphur is mentioned hundreds of times, there is no allusion to any of its characteristic properties except its action on metals. This is in such strong contrast to the spirit of the Greek science of classical times that we must conclude that the alchemists were not interested in natural phenomena other than those which might help them to attain their object (...) We shall not find in alchemy any beginnings of a science. At no time does the alchemist employ a scientific procedure.

The alchemist's "absence of scientific spirit" is then seemed as a matter of not paying attention to what happens when it is not related to the will of "attain their object", in their case. to produce gold or the elixir of life. This strong orientation towards a goal that blinds the alchemist to another aspects of matter is taken by Eliade as the opposite of science. But, if one looks at detail what happens in most laboratories today, as the alchemists from before many of them are just interested in proving the hypothesis they formulated before, simply dismissing all other results. In the definition of Thomas Kuhn (1970, p. 24) it is also an important feature of "normal science":

Normal science consists in the actualization of that promise, an actualization achieved by extending the knowledge of those facts that the paradigm displays as particularly revealing, by increasing the extent of the match between those facts and the paradigm's predictions, and by further articulation of the paradigm itself. Few people who are not actually practitioners of a mature science realize how much mop-up work of this sort a paradigm leaves to be done or quite how fascinating such work can prove in the execution. And these points need to be understood Mop-ping-up operations are what engage most scientists throughout their careers. They constitute what I am here calling normal science. **Closely examined, whether historically or in the contemporary laboratory, that enterprise seems an attempt to force nature into the preformed and relatively inflexible box that the paradigm supplies. No part of the aim of normal science is to call forth new sorts of phenomena; indeed those that will not fit the box are often not seen at all.** Nor do scientists normally aim to invent new theories, and they are often intolerant of those invented by others. Instead, normal-scientific research is directed to the articulation of those phenomena and theories that the paradigm already supplies. (Emphasis added)

Not only the modern laboratory is a microcosm, a box, to the investigation of nature, but also as the alchemists the normal science usually is not interested in phenomena that do not fits its predetermined goals. In this sense we could turn Eliade's argument around and use it as a defense of alchemy's similarities with modern sciences. This turnaround example renders easier to present the difficulties of differentiating magic and alchemy from science, how the divide is far from transparent. From this we can present the contra intuitive conception (at least for our modern sense) of the difference between science and magic posed by Frazer (1917, p.233):

The principles of association are excellent in themselves, and indeed absolutely essential to the working of the human mind. Legitimately applied they yield science; illegitimately applied they yield magic, the bastard sister of science. It is therefore a truism, almost a tautology, to

say that all magic is necessarily false and barren; for were it ever to become true and fruitful, it would no longer be magic but science".

As the general principle of association is the same and just the specific connections are different, the division between science and magic is seen by Frazer as somewhat circular, a matter of legitimacy and results that will necessary be related to the evaluation of its historical time. If something is at time thought to be true, then it is understood as science, if it is thought to be false, it's called magic or superstition.

### **Mauss and the analysis of magic as a storehouse of ideas**

Marcel Mauss, other of anthropology's founding fathers, wrote in 1902 his *Esquisse d'une théorie générale de la magie* (A general theory of magic), that (MAUSS, 1972, p. 75):

Magical practices are not entirely without sense. They correspond to representations which are often very rich (as we have seen, all ritual is a kind of language); it therefore translates ideas. The minimum of display which each magical act involves is display of its effect. But this display, however rudimentary it may conceivably be, is already highly complex. It has several components, several levels.

Magic is the prototype of the projection of meaning in the world. It makes de magician believe in its effect and then to relate one thing to another through language, gathering these relations in rites and formulas, stablishing them as a tradition. In this sense, repetition, as in a scientific methodology, is a necessary part: "magic and magical rites, as a whole, are traditional facts. Actions which are never repeated cannot be called magical" (MAUSS, 1972, p. 23). By gathering ideas and organizing them withing the rules stablished by tradition it allows us to start forming knowledge. As Mauss says, "this treasury of ideas, amassed by magic, was a capital store which science for a long time exploited" (1972, p.177).

Today our idea of magic or sorcery is that of a pure ineffective knowledge, but this representation of ours is an anachronism. It measures the effectiveness of an idea that was already alive before our times by the form of knowledge that we *now* perceive as effective and true. Mauss stresses that even etymologically the words for magic rites are derived from the idea that they have an effect<sup>4</sup>. If in the beginning of agriculture people thought that there was necessary a rite to

---

<sup>4</sup> "Rites are eminently effective, they are creative, they do things (...) in some cases even, ritual derives its names from a reference to these affective characteristics: in India the word which best corresponds to our word ritual is karman, action; sympathetic magic is the factum, krtyâ, par excellence. The German word Zauber has the same etymological

produce grains, and that this rite involved implanting seeds in mother's Earth womb while singing, it is no less knowledge because it takes a form of a rite that has a singing part. If a miner thinks that by digging in a certain way what he is doing is accelerating the rhythm of grow of metals<sup>5</sup>, it doesn't cease to be, because of his belief, effective knowledge on how to mine. In this way Mauss (1972, p. 24) lists a series of techniques that relied on magic:

Magic, in general, aids and abets techniques such as fishing, hunting and farming. Other arts are, in a manner of speaking, entirely swamped by magic. Medicine and Alchemy are examples: for a long period technical elements were reduced to a minimum and magic became the dominant partner; they depended on magic to such an extent that they seemed to have grown from it. Medicine, almost to our own days, has remained hedged in by religious and magical taboos, prayers, incantations and astrological predictions. Furthermore, a doctor's drugs and potions and a surgeon's incisions are a real tissue of symbolic, sympathetic, homeopathic and anti-pathetic actions which are really thought as magical.

As Frazer, Mauss point out in the underlying structure of magic the precondition of scientific thought, its basis as search for knowledge. It works by positing that the world has "natural laws" that need to be followed if the pretended effect is to be obtained (MAUSS, 1972, p 176-177):

Magic is linked to science in the same way as it is linked to technology. It is not only a practical art, it is also a storehouse of ideas. It attaches great importance to knowledge - one of its mainsprings. In fact, we have seen over and over again how, as far as magic is concerned, knowledge is power. (...) It quickly set up a kind of index of plants, metals, phenomena, beings and life in general, and became an early store of information for the astronomical, physical and natural sciences. It is fact that certain branches of magic, such as astrology and alchemy, were called applied physics in Greece.

Gathering this "treasure of ideas" by experience was possible just because the fundamental structures of knowledge were already present in magical thought (MAUSS, 1972, p. 178):

A good part of all those non-positive mystical and poetical elements in our notions of force, causation, effect and substance could be traced back to the old habits of mind in which magic was born (...) we shall find magical origins in those early forms of collective representations which have since become the basis for individual understanding.

---

meaning; in other languages the words for magic contain the root to do" (MAUSS, 1972, p. 24). We could add that in Portuguese, the mother language of this essays' author, the word "feitiço" is also derived from the verb "fazer", that means "to make".

<sup>5</sup> "The miner and metalworker intervene in the unfolding of subterranean embryology: they accelerate the rhythm of the growth of ores; they collaborate in the work of nature and assist it in giving birth more rapidly. In a word, man, with his various techniques, gradually takes the place of time: his labors replace the work of time" (COUDERT, 2005, p. 236).

## **Lévi-Strauss and the human power of classification**

Sixty years after Mauss, in 1962, Claude Lévi-Strauss published his *La Pensée Sauvage*, (The Savage Mind) which confirms the theories developed by the tradition of anthropology while tries to formulate the problems in new terms. His form of approaching may be somehow for us easier to comprehend as he is closer to us in history, but the main point goes in the same direction presented before (LÉVI-STRAUSS, 1966, p. 16):

Myths and rites are far from being, as has often been held, the product of man's 'myth-making faculty', turning its back to reality. Their principal value is indeed to preserve until the present time the remains of methods of observation and reflection which were (and no doubt still are) precisely adapted to discoveries of a certain type: those which nature authorized from the starting point of a speculative organization and exploitation of the sensible world in sensible terms

As he states "the thought we call primitive is founded on the demand for order. This is equally true of all thought" (1966, p. 10). Following this line, maybe the most general point made by him is that the ordering faculty of thought works even when the order is not "correct", as normally is thought to be necessary. The focus in judging if something is "true" or "false" is of much less importance than the existence of the classification in itself. In his words, "classifying, as opposed to not classifying, has a value of its own, whatever form the classification may take" (1966, p. 9). Or even more explicit "any classification is superior to chaos and even a classification at the level of sensible properties is a step towards rational ordering" (LÉVI-STRAUSS, 1966, p.15).

We could use the zodiac signs as example. Its classification of people in 12 different categories works *even if it is not right*. Just by imposing a frame, even if there are no general validity on the attributes of people of a sign, it is helpful to understand someone. People of cancer, for instance, are said to be sentimental. If someone thinking within this frame meets someone from the sign of cancer that, as experience shows, is not sentimental, the classification will still work by the negative: it would be remembered that someone is from cancer, but is not sentimental. Then the exception of the general rule "being of the sign of cancer" can be searched along new subcategories as the moon, the rising etc. The classification provides a frame, a system, in which is possible to establish similarities and dissimilarities between things or persons and, then, to facilitate its understanding and memorization. Knowledge is created within such a system that

allows us to establish relations mediated by its frame, usually bearing the ability to create new subdivisions in order to allocate unforeseen special cases. One can see that in the constant adaptation of details in rituals, what explain the deep complexity developed by some of them. As Lévi-Strauss puts it (1966, p. 10), "examined superficially and from the outside, the refinements of ritual can appear pointless. They are explicable by a concern for what one might call 'micro-adjustments' a concern to assign every creature, object or feature to a place within a class".

Normal science – the established one, not the revolutionary - operates in a similar way, by posing a paradigm and then turning the scientist's efforts to solve problems within its "system". Kuhn even describes this way of proceeding of normal science as the solving of a puzzle i.e. adjusting the observable world to the structure of the paradigm (KUHN, 1970, p. 42):

The existence of this strong network of commitments—conceptual, theoretical, instrumental, and methodological—is a principal source of the metaphor that relates normal science to puzzle-solving. Because it provides rules that tell the practitioner of a mature specialty what both the world and his science are like, he can concentrate with assurance upon the esoteric problems that these rules and existing knowledge define for him. What then personally challenges him is how to bring the residual puzzle to a solution. In these and other respects a discussion of puzzles and of rules illuminates the nature of normal scientific practice.

The magical tradition and its rites, as a *tradition*, imposes a kind of 'paradigm' that is used to interpret reality allocating everything in its different classes. As Lévi-Strauss perceived in a somewhat similar fashion to Frazer, the problem of the difference between magic and science is not absolute. It turns to be more a problem of how the classification is made in relation to the objective condition in which lives the person thinking within the frame (1966, p. 13):

Both science and magic however require the same sort of mental operations and they differ not so much in kind as in the different types of phenomena to which they are applied. These relations are a consequence of the objective conditions in which magic and scientific knowledge appeared"

### **Hegel and the opening of the huge gate of superstition**

Now we are going to briefly introduce Georg W. F. Hegel's theory of magic. It is mainly in his *Vorlesungen über die Philosophie der Religion* (Lectures on the Philosophy of Religion), posthumously published in 1832. Given the difficult to read the text and the general prejudice people have today against him, I thought it would be better to bring his position after exposing the

one from anthropology. At first it is important to notice that Hegel's position was seen by Frazer (1917, p. xi) in ways as anticipating his own:

Friends versed in German philosophy have pointed out to me that my views of magic and religion and their relations to each other in history agree to some extent with those of Hegel. The agreement is quite independent and to me unexpected, for I have never studied the philosopher's writings nor attended to his speculations. (...) the partial coincidence of our conclusions may perhaps be taken to furnish a certain presumption in favour of their truth.

We don't intend here to do a comparison of both thinkers, but just present the fundamentals of Hegel's analysis on magic, that works in the same direction of the anthropology although it has a more general in scope. Hegel starts it by stating that: "The absolutely primary form of religion, to which we give the name of magic (*Zauberei*), consists in this, that the Spiritual is the ruling power over nature". (HEGEL, 1895, p. 291). At first this definition seems to be quite deceiving for its amplitude or vagueness, and one can understand why so much learned people doubt of the straightforwardness of his ideas. But he insists on it (1895, p. 293-283):

Magic, however, in the general sense, simply amounts to this, that man has the mastery as he is in his natural state, as possessed of passions and desires. Such is the general character of this primal and wholly immediate standpoint, namely, that the human consciousness, any definite human being, is recognized as the ruling power over nature in virtue of his own will.

Magic is not seen as something ineffective, but on the contrary, is the basis for every human enterprise as it at first made possible for mankind to control its desires putting ahead some action that changes nature. Is the idea of magic itself - that there is some hidden meaning that makes possible for us to control nature, or, to put in Hegel's terms, that the "spiritual is the ruling power over nature" - that allows us to change reality. The philosopher insists on this, saying that it would be easier to understand what he means by an example collected among missionaries' writings (HEGEL, 1895, p. 296):

A missionary who found himself at the head of a Portuguese army relates that the blacks who were their allies had brought a magician (...) with them. A hurricane rendered his conjuring arts needful, and, in spite of the strong opposition of the missionary, they were resorted to. The magician appeared in a peculiar fantastical dress, looked up at the sky and the clouds, and afterwards chewed roots and murmured phrases. As the clouds drew nearer, he broke out into howls, made signs to the clouds, and spat towards the sky. The storm continuing notwithstanding, he waxed furious, shot arrows at the sky, threatened it with bad treatment, and thrust at the clouds with his knife.

In what others would see as pure mysticism, Hegel saw through the magical act the sorcerer ruling his fear and gaining control over his own body. The spiritual part - that means the language and the forms of knowledge that are socially learned - gained control of the body by positing

simply that knowledge has control of reality. As mystical as it can be, this simple thought is the source that allows our “I” to gain control of our own nature, and differently from an animal not only run and try to hide in face of danger. This is a precondition to all other human accomplishments, that the subject implicitly knows he is a power that can act over natural things, the first being his own body. Today this aspect of magic is much more studied in the psychoanalysis than in anthropology.

Hegel establishes a difference between this form of magic, that he calls *immediate* (or *direct*), and the other, mediated form of magic, that of "the indirect power, which we exercise by means of implements over natural objects in their separate forms." (p. 292). Hegel's now is dealing with the magic applied over the external world, one logical step forward the mere control of the body.

As in his philosophy or in the generalizations of anthropology – derived from the analysis of many different cases – here we are dealing with the general form of magical thought, without going into specific cases. That's important to point out to avoid misunderstandings. Zornica Kirkova, for instance, (2020, p. 1) have shown that “alchemy in China developed in two major forms of practice: *waidan* 外丹, external or practical laboratory alchemy and *neidan* 内丹, inner or psycho-physiological alchemy”. One can see here the same pattern of division that Hegel saw between mediated (over things) and immediate (over one's own body) magic. But the order of appearance is inverted, as Kirkova makes clear by saying that external alchemy (2020, p. 1) “can be traced back to the 2nd century BC” while (2020, p.1):

Inner alchemy became widespread from the 10th century onwards. It borrowed a significant part of its principles, vocabulary and symbolism from the laboratory alchemy but aimed to produce the elixir within the alchemist's body, using as ingredients the major cosmic components and energies already present in the human being. These were refined and transmuted through a vast array of psycho-physiological practices.

This specific development doesn't affect the general logical form presented by Hegel, the need to first gain some level of control over the own body to them be able to control the external world. Control of breathing or of sexual drive, for example, falls into the general form of what Hegel called immediate magic, and were present before even if they were only later theorized<sup>6</sup>.

---

<sup>6</sup> As Kirkova (2020, p. 10) explicitly points out, before inner alchemy was established as a tradition, some of it practices were already been cultivated: “During the period of division after the fall of the Han Empire (220-589) yet other traditions of self-cultivation based on meditation and visualization of inner gods proliferated alongside the Grand

Usually, the advent of a new spiritual form (understood also as *social form*), does not erase the former, but flows back enriching it, as appears to be in this case.

In this realm of indirect magic, or magic applied over thing, Hegel sees the emergence of the reflexive connection between things, or, in his words (1895, p. 301) “that natural things appear to be within one another, stand in connection with one another, that the one is to be known by means of the other, has its meaning as cause and effect, so that, in fact, they are essentially in a condition of relation”. That is the foundation of causality, the knowledge that things are somehow mutually related. This relation is stored in tradition as magical knowledge and he acquire control (HEGEL, 1895, p. 292):

by means of his knowledge of the qualities of things, that is to say, of things as they are in regard to other things; another element thus makes its influence felt in them, and their weakness at once shows itself. He learns to know them on that weak side, and operates on them by so arming himself that he is able to attack them in their weakness and to compel them to submit to him.

Thus, the subject can, by using this knowledge that is ideality of property of things operating through this magical system of thought, control them by his will (HEGEL, 1895, p. 302):

The subject has the means in its hand: to produce this result is merely its intention, its aim. The "I" is the magician, but it conquers the thing by means of the thing itself. In magic, things show themselves as ideal. The ideality is thus a characteristic which belongs to them as things; it is an objective quality, which comes into consciousness by means of the very exercise of magic, and is itself only posited, made use of.

Its working in its magic, using it, mankind acquired knowledge over the natural properties of things, finding the way to control them. Hegel sees this form of freedom in the rule of natural world not as pure freedom, because: "any influence exercised by man, by means of his ideas, of his will, presupposes this mutual unfreedom, since power over external things is indeed attributed to man as representing what is Spiritual, but not as being a power which acts in a free manner" (1895, p. 292). The way one need to act to control things is not free, but it needs to follow the "laws of nature" present in the thing. As in a technique it is only possible to obtain an effect by using the way of nature against itself. In order to control the flow of a river, it is needed to dig deeper in the direction that is wanted the river to flow, and not do something against the nature of river. Thats why magic is also not free, because as a technique it is bound to this “mutual

---

Purity tradition. Although these do not constitute alchemy in the proper sense of the word, they provided a basis for interiorizing the alchemical process and its transformation into inner alchemy in the coming centuries”.

unfreedom”. It depends on the will of the subject, but the subject must act in a specific, unfree manner, to obtain the result (HEGEL, 1895, p. 302):

The change which is to be brought about may in one sense depend upon the nature of the means employed, but the principal thing is the will of the subject. This mediated magic is infinitely widespread, and it is difficult to define its limits and determine what is and what is not included in it. The principle of magic is that the connection between the means and the result is not known. Magic exists everywhere where this connection is merely present without being understood. The same thing holds good, too, of medicines in hundreds of cases, and all we can really do is to appeal to experience. The other alternative would be the rational course, namely, to get to know the nature of the remedy.

Here we have one definition of magic that is quite close to the one of anthropology, as when the connection between things is present, but although it can be effective, its principle is not known. Not only in our modern medicine, but any of today's high scientific experiments that shows effects that we are still not able to conceptualize, could be regarded as a kind of magic. As he emphasizes “it is difficult to define its limits and determine what is and what is not included in it”, so even when magic can be defined like this it is still hard to know what “not known” here means. Solving this problem is for Hegel a matter that will be cleared only by the exposition of the further development of spirit, a way beyond the scope of this paper. But it is important to point out that, as he writes in the *Phenomenology of Spirit*, the “path to science is itself already science, and according to its content it is thereby the science of the *experience of consciousness*” (HEGEL, 2017, p. 58). Magic as the starting point of the causality enables this path, and, in this way, is already science. To reproach it because of its incompleteness is to be blind to the demand of further development that is in its core<sup>7</sup>, demand that were also perceived by researchers of alchemy<sup>8</sup>.

---

<sup>7</sup> “At its debut, where science has been brought neither to completeness of detail nor to perfection of form, it is open to reproach. However, even if it is unjust to suppose that this reproach even touches on the essence of science, it would be just as unjust and inadmissible not to honor the demand for the further development of science” (phenomenology, p. 10). “Science, insofar as it comes onto the scene, is itself an appearance; science’s coming onto the scene is not yet science as it is carried out and unfolded in its truth. It makes no difference in this regard whether one thinks that science is an appearance because it comes onto the scene alongside a kind of knowing that is other than it, or whether one calls that other, untrue kind of knowing science’s own appearing. But science must free itself from this surface appearance; and it can do so only by turning itself against it. For with regard to a knowing that is not truthful, science cannot simply reject it as just a common view of things while giving out the assurance that it is itself a completely different kind of cognition and that that other knowing counts as absolutely nothing for science; nor can science appeal to some intimation, contained within that other knowing, of something better”. (phenomenology, p. 51)

<sup>8</sup> “Yet the triumph of experimental science did not abolish the dreams and ideals of the alchemist; on the contrary, the new ideology of the nineteenth century crystallized around the myth of infinite progress. Boosted by the

Hegel, as also the anthropological lineage, doesn't see magic as without sense, but on the contrary, as the first form of giving meaning to things by relating one to another. Its presence reveals that human kind already passed through the huge gate that make the world meaningful by establishing an ordering principle (HEGEL, 1895, p. 303):

If the sphere of mediation in magic be once entered, the huge gate of superstition is opened, and then every detail of existence becomes significant, for every circumstance has results, has ends; everything is both mediated and mediating, everything governs and is governed: what a man does depends as to its results upon circumstances; what he is, his aims, depend upon certain conditions. He exists in an external world, amidst a variety of connections of cause and effect, and the individual is only a ruling force to the extent to which he has power over the particular forces thus connected. In so far as this connection remains undetermined, and the definite nature things is still unknown, we float about in a condition of absolute contingency. Since reflection enters into this region of relations, it has the belief that things stand to one another in a relation of reciprocity. This belief is quite correct, but the defect in it is that it is still abstract, and consequently the definite special character of action, the precise mode of action, the exact nature of the connection of things with other things is not as yet present in it.

As the connection is believed but not really known, contingency comes into play as a major factor. That may be the basis to explain not only the similarities between forms of magic developed by different folks, but also its differences. We can talk in magic about a principle of causality, but not understood as the modern principle of strict causality. The 'ordering faculty of thought', as Levi-Strauss nicely putted, is there as a *need to classify*, but also contingency comes into play in *how to classify*. In other words, this contingency could be the base to understand why, for instance, the fundamental elements can vary even if they exist in the different traditions<sup>9</sup>.

## **Conclusion: about the relation between magic and science**

---

development of the experimental sciences and the progress of industrialization, this ideology took up and carried forward— radical secularization notwithstanding—the millenarian dream of the alchemist. The myth of the perfection and redemption of nature has survived in camouflaged form in the Promethean program of industrialized societies, whose aim is the transformation of nature, and especially the transmutation of matter into energy. It was also in the nineteenth century that man succeeded in supplanting time. His desire to accelerate the natural tempo of organic and inorganic beings now began to be realized, as organic chemists demonstrated the possibility of accelerating and even eliminating time by preparing in laboratories and factories substances that would have taken nature thousands of years to produce. With what he recognizes as most essential in himself—his applied intelligence and his capacity for work— modern man takes upon himself the function of temporal duration; in other words, he takes on the role of time" COUDERT, 2005, p. 236)

<sup>9</sup> The Greek lists usually four classical elements: water, earth, fire and air. The Chinese usually lists five elements: wood (木 mù), fire (火 huǒ), earth (土 tǔ), metal (金 jīn), and water (水 shuǐ). The necessity of framing a basic classification system is present in many cultures, but the specific way this task is accomplished is contingent.

Summarizing our findings, magic is, according to at least part of anthropology and Hegel, the basic form of acquiring knowledge. It has in itself the roots of human understanding as it posits the everything is in relation, allowing human kind to start organizing its experiences. As different from the modern principle of strict causality as it can be, the causality present in magic lays down the modern's foundation by positing that the things stand in connection one to another. This allowed us to establish classification systems forming traditions of thought.

It can be said that magic's difference to science is that the principle of connection, albeit present, is not known. But to say what this "not known" means, is a question that only can be answered in relation to the form of knowledge bounded to the stage of society's development, or, to put in Hegel's terms, in relation to one specific stage of spirit. That stands in close connection to Frazer's statement that (1917, p. 233) "it is therefore a truism, almost a tautology, to say that all magic is necessarily false and barren; for were it ever to become true and fruitful, it would no longer be magic but science". It could be said that it also matches the formulation of the science fiction writer Arthur C. Clarke in his famous third law, that states that "any sufficiently advanced technology is indistinguishable from magic". A rite that once followed lead to a result, without any rational explanation, appears as something mystic, even if it is highly technological. It is hard to perceive things like this because in our common sense and in our daily life the distinction between science and magic (as also religion) may appear as something clear and uncontested.

This problem of distinction from magic goes well into what is undoubtedly considered to be science, as one acquainted with the differences from Newtonian physics and the one developed by Einstein can easily understand. Einstein's rejects all the starting points of Newton and also its general conception of the universe with time and space as a constant, and then, if one theory is to be considered true, the other need to be considered false, or in Kuhn's words (1970, p. 98):

From the viewpoint of this essay these two theories are fundamentally incompatible in the sense illustrated by the relation of Copernican to Ptolemaic astronomy: Einstein's theory can be accepted only with the recognition that Newton's was wrong.

Should we after Einstein perceive the theory of Newton no more as science but as some developed case of magic or alchemy (about which, by the way, he wrote thousands of pages), since it was debunked and is not "right" anymore? This provocative question cannot be answered with a simple "yes" or "no". It requires much more distancing from simplistic differentiation relying on mere words, as if it was possible to separate in such clear categories all the knowledge human kind

amassed in millennia of experimentations. That is why it is also arbitrary the distinction between “spiritual” and “scientific” goals in which some researchers relay on. Even in the hall of the greatest physicists many of them believed, as Galileu, Espinoza, Newton, Einstein etc., in some form of God, as impersonal it could be, revealing itself to them in form of their own theories. Would because of that their theories be considered “spiritual” instead of “scientific”?

The question between the different forms of knowledge the human kind produced should not be classified between “true or false” and “scientific or mystical”. As Levi-Strauss said (1966, p.13), these kinds of knowledge “require the same sort of mental operations and they differ not so much in kind as in the different types of phenomena to which they are applied. These relations are a consequence of the objective conditions in which magic and scientific knowledge appeared”. Its difference should be searched in these different objective conditions (social, technological, ideological etc.) that generates different epistemological ways of understanding the world and manipulating things in order to produce effects.

### **Bibliographic references**

- COUDERT, Allison. "Alchemy" in *Encyclopedia of religion*, 2nd Edition. (Editor JONES, Lindsay). Farmington: Thomson Gale, 2005.
- ELIADE, Mircea. *The Forge and the Crucible*. 2<sup>nd</sup> Edition. Chicago: The University of Chicago Press, 1978.
- FRAZER, James. *The Golden Bough: A Study in Magic and Religion*, 3rd Edition (Vol. 1 of 12). London: Macmillan, 1917.
- HEGEL, G.W.F. *Philosophy of Religion*. (Vol. 1 of 3) London: Kegan Paul, Trench, Trübner e Co Ltda, 1895.
- HEGEL, G.W.F. *The Phenomenology of Spirit*. New York: Cambridge University Press, 2017.
- KIRKOVA, Zornica. *Chinese Alchemy*. 2020.
- KUHN, Thomas S. *The Structure of Scientific Revolutions*. 2<sup>nd</sup> Edition, enlarged. Chicago: The University of Chicago, 1970.
- LÉVI-STRAUSS, Claude. *The Savage Mind*. Letchworth, Hertfordshire: The Garden City Press, 1966.
- MAUSS, Marcel. *General Theory of Magic*. London and New York: Routledge Classic, 1972.
- SHEPPARD, H. J. *Chinese and Western Alchemy: The link through definition*. *AMBIX*, Vol. 32, Part I, March 1985.