NAZARİYAT

Analyzing Alchemical Body and Causality Theories in Islamic Civilization based on Jābir ibn Ḥayyān's System*

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Summary: The basis of Islamic alchemy and matter theory is found in the works of Jābir ibn Ḥayyān (d. 200/815). Jābir developed an element theory similar to Aristotle's system. Still, he interpreted matter and substance differently by transferring the basis of the theory from elements to qualities. In Jābir's system, qualities are more often expressed by the term "natures" (*ṭabā'i'*). In Jābir's thought, four natures precede the four elements, and due to the combination of two different natures with the substance each time, four distinct elements with different qualities occur. In Jābir, the "primary bodies" of the natural world are no longer the four Empedoclean elements but the "four natures"; air, water, earth, and fire are made up of these natures. Thus, Jābir gave the four primary Aristotelian qualities the role of genuine elements by making them tangible, independent, and corporeal entities. According to Jābir, the operation of transforming (transmutation) of *ajsād* ('bodies') such as iron, copper, tin, and lead, which is the primary purpose of the Art of alchemy, into silver and gold is carried out within the framework of the science of *mīzān*. The core of this transformation is based on an idea of causality in which the four natures and their specific proportions and measures are at the center. With the idea of causality that allows chemical transformation, Jābir also succeeded in extending the possibility of transformation in alchemy from the inorganic world to the organic world to an extensive range of entities. This study will discuss Jābir's thoughts on body, substance, and experimental causality by examining Jābir's corpus through primary sources.

Key Words: Jābir ibn Ḥayyān, alchemy, four nature-four elements, substance, causality.

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Introduction

In the history of Islamic thought, four theories have been developed regarding the basic components of the body: atomism, the theory of latency and appearance (*ẓuhūr-kumūn*), accidentalism, and matter-form theory. Atomism, as systematized by Abū al-Huẕayl al-'Allāf (d. 235/~849-50), became the dominant theory in the *kalam* tradition and remained so until the 20th century. The theory of *ẓuhūr-kumūn*, developed by Naẓẓām (d. 231/845), posits that objects emerge from the union of infinite natures (*kumūn*), with what emerges (*ẓuhūr*) giving the object its name and definition. Accidentalism, developed by Ḍirār ibn 'Amr (d. 200/~815) and adopted by Imām Māturīdī (d. 333/944), asserts that all created objects consist of accidents that cannot exist independently.[1]

According to the matter-form theory, a body can theoretically be divided indefinitely. However, two final components are the real parts of the body: matter (*hayūlā/hyle*) and form (*ṣūra*). In a body, matter always represents a state of possibility, while form represents the actual being of the body. In other words, matter corresponds to potency, and form corresponds to act. For example, in a wooden sculpture of a lion, the wood itself is analogous to matter, and the lion shape given to the wood is analogous to form. Neither the matter nor the form of the body, which consists of both, can exist alone. The form of the lion cannot exist without the wood, and the wood, which serves as the matter for the lion, cannot exist alone as the matter of the lion. Matter and form are metaphysical elements. A body existing in the external world requires matter with the potential to take any form, a form of corporeality that enables it to be three-dimensional, and a species form that defines it as a member of a certain species.[2]

The theory of matter and form, pioneered by Aristotle, significantly influenced philosophical studies in both the Islamic and Christian worlds until the end of the 19th century and the Renaissance[3]. Before the advent of Islam, the philosophical landscape was shaped by texts that interpolated Plato and Aristotle, leading to the emergence of Neoplatonism. Islam inherited an Aristotelian tradition influenced by pagan Athenian and Christian Alexandrian thought, deeply immersed in Neoplato-

1 Ömer Türker, *İslam Felsefesine Konusal Giriş* (Ankara: Bilay, 2020), 120.

2 Türker, *İslam Felsefesi*, 120.

3 For the hylomorphic problem and its reflections in Peripatetic tradition, *see* İbrahim Halil Üçer, "İbn Sina Felsefesinde Suret Anlayışı" (Doktora Tezi, Sakarya Üniversitesi, 2014). *See* also Muhittin Macit, *İbn Sina'da Doğa Felsefesi ve Meşşai Gelenekteki Yeri* (İstanbul: Litera Yay., 2006).

nism, inheriting both schools' debates and interpretive concerns. Aristotle posited that the "first subject" (*hypokeimenon proton*) of the concrete and knowable properties of bodies was not concrete or self-knowable, with matter known only through comparison. However, under the influence of Neoplatonists, Aristotle's concepts underwent significant transformation. For instance, the prime matter, initially defined negatively as an abstraction accessible only through contemplation of forms, was reimagined as an extension (*diastema*) by Simplicius (written after 529). Later, under the interpretation of John Philoponus (Yaḥyā al-Naḥwī, d. 570 AD)[4], it took on a "three-dimensional" quality.

Aristotle's substance is every concrete and individually existing thing, the subject to which something is predicated: this table, this tree, Socrates. Each substance expresses a particular "this" and needs a subject that becomes definite by accepting a form. This primary subject is matter (*hayūlā/hyle*).[5] Aristotle's matter is only an abstraction and can only be reached through a thought experiment. If an object is taken and stripped of all its features (color, smell, taste, width, length) to get the primary subject – which is only possible in thought – the features that make this object what it is are "form/*ṣūra*." In that case, the primary subject that turns into a substance through these properties is "matter."[6]

In Aristotle's system, matter is the subject of substance; the substance is the subject of the nine categories of being. Aristotle expresses the "subject" (substance) to which something is predicated and the "predicates" attributed to this subject in ten categories in total. These are "substance," "quantity," "quality," "place," "time," "relation," "position," "states," "actions," and "passions." Once a "subject" has been determined, the sum of the predicates that can be attributed to that subject is categorically nine classes. These are not predicates; they are the most general concept forms that include all concepts. In this respect, categories are the most general lists of predicates about various entities that can be named. They should be considered "accidents" that may or may not be associated with the relevant entity.[7] Aristotle states that the word "substance" (*ousia*) is used for at least four things: "subject-base"

4 Syed Nomanul Haq, *Names, Natures and Things: The Alchemist Jābir ibn Ḥayyān and his Kitāb al-Aḥjār* (*Book of stones*) (Dordrecht: Kluwer Academic Publishers, 1994), 49.

5 Haq, *Names, Natures and Things*, 51-52.

6 R. Sorabji, *Matter, Space and Motion* (Ithaca: Cornell University Press, 1988), 5.

7 Hülya Altunya ve Mustafa Yeşil, "Aristoteles'in Kategoriler Kuramının Ele Alınış Biçimleri," *Beytulhikme An International Journal of Philosophy* 6/2 (2016): 85.

(*hypokeimenon, substratum-subject*), "essence" (*to ti en einai*), "universal" (*katholou*), and "genus." Aristotle first stated that "earth," "water," "air," and "fire" are substances and that naturally existing beings such as "man," "stone," and "tree" are composed of various combinations of these substances at the most basic level.[8]

Another element that Aristotle considers as "subject-base" is the individual entities that can be indicated by the expressions "this" or "that." In other words, from the philosopher's point of view, in the most correct, primary, and most precise sense of the word, a substance is neither a predicate about a subject nor something found in a subject, as in the examples of human beings and horses. In this context, Aristotle considers "subject-base" as "primary substances".[9] So what makes any primary substance whatever it is? Another type of substance that Aristotle brings to the fore in this context: the "essence" (*tode ti/to ti en einai*) that makes something what it is. The primary substance is composed of matter and form components, and which is a substance in the real sense is a necessary condition for the "essence" to be understood.[10]

While Aristotle's system acknowledges "earth," "air," "water," and "fire" as fundamental substances, the exact level and extent to which objects and primary substances combine with these elements remain indeterminate, rendering matter (*hyle*) entirely indefinite. Aristotle argues that matter cannot be a substance because it lacks self-sufficiency; instead, it exists as potentiality. In Aristotle's framework, form actualizes matter (*hulê/ hayūlā*), rendering it a concrete object.[11] Due to its uncertainty and unknowability, the matter of the body, which comprises a matter-form combination, is not considered a substance. Instead, a substance is attributed to the "form" that shapes and individualizes it. This perspective, known as hylomorphism, identifies "form" as the "essence" that defines an object.[12]

Aristotle's idea of matter was incomprehensible to some later thinkers. Islamic scholar Jābir ibn Ḥayyān, considered the 'father of alchemy,' also thought the idea of primary matter unacceptable:[13]

8 Altunya ve Yeşil, *Aristoteles'in Kategoriler Kuramı*, 87.
9 Altunya ve Yeşil, *Aristoteles'in Kategoriler Kuramı*, 88.
10 Altunya ve Yeşil, *Aristoteles'in Kategoriler Kuramı*, 89.
11 Altunya ve Yeşil, *Aristoteles'in Kategoriler Kuramı*, 90.
12 Altunya ve Yeşil, *Aristoteles'in Kategoriler Kuramı*, 92.
13 Haq, *Names, Natures and Things*, 53.

> It is, you claim, the undifferentiated form of things and the element of created objects. The picture of this [entity], you say, exists only in the imagination, and it is not possible to visualize it as a defined entity. ... Now all this is nonsense![14]

Islamic alchemy and matter theory find their roots in the works of Abū Mūsā Jābir ibn Ḥayyān (d. 200/815), also known as al-Ḥarrānī and al-Ṣūfī. The historical existence of Jābir has been a topic of scholarly debate, with questions raised about the extent and unity of his work. Traditionally, Jābir's birth is placed around 721 AD, and his death is recorded as early as 802 AD, though some accounts suggest a date as late as 815 AD. This period coincided with what historians term the Islamic Renaissance, marked by significant intellectual and artistic activity. Born into a family of pharmacists in Kufa, Jābir's father was executed due to his involvement in political activities against the caliph. Jābir himself later pursued studies in Arabia and likely practiced medicine in Baghdad, enjoying patronage under the influential Barmakid family during the Abbasid caliphate of Hārūn al-Rashīd (d. 193/809).[15]

Jābir ibn Ḥayyān's Theory of Qualities and His Comprehension of Substance

Jābir developed an element theory similar to the Aristotelian system but interpreted matter and substance differently, transferring the basis of the theory from material elements to qualities. Contrary to the familiar Aristotelian qualities, Jābir's natures were not abstractions or additions to matter. Jābir made the four primary Aristotelian qualities – hot, cold, moist, and dry – concrete, independent, and corporeal beings. For Aristotle, qualities are just forms that consist of logical abstractions. In Jābir, the qualities are the real elements of the natural world, not the Empedoclean four elements.

Jābir's contribution to elemental theory resembles Aristotle's framework yet diverges significantly in its treatment of matter and substance. From Aristotle's approach, Jābir reframes the theory by emphasizing qualities over material elements.

14 Jābir ibn Ḥayyān, "Kitāb al-Aḥjār," *Names, Natures and Things: The Alchemist Jābir ibn Ḥayyān and his Kitāb al-Aḥjār* (*Book of stones*), Syed Nomanul Haq (Dordrecht: Kluwer Academic Publishers, 1994), 157-158.

15 Andrew Ede, *The Chemical Element: A Historical Perspective* (Westport, Connecticut: Greenwood Press, 2006), 23-27.

Unlike Aristotle's abstract qualities[16], Jābir's natures are not conceptual additions to matter but tangible, corporeal entities. Jābir redefines the four primary Aristotelian qualities—hot, cold, moist, and dry—as concrete, independent elements of the natural world. In this reinterpretation, Jābir shifts the focus from the traditional Empedoclean four elements to these fundamental qualities, considering them the actual constituents of the natural realm.

Jābir's theory of qualities forms the core of his entire natural system.[17] The fundamental reality behind existence in Jābir's system is different from a principle such as *arche* (*usṭuquss*, that which all things dissolve into itself), *apeiron* and *monas*, or something corporeal such *as fire, air, water, earth*, or Aristotelian concept of *hayūlā*. The *arche* of Jābir is, above all, qualitative. Jābir acknowledges *arche* as the four fundamental qualitative elements: hot, cold, dry, and moist.[18] He calls them "principles" (*uṣūl*, sing. *aṣl*), "bases" (*arkān*, sing. *rukn*), "first simples" and "first elements," but he most often refers to them by the term "natures" (*ṭabā'i'*, sing. *ṭabī'a*).[19] According to Jābir, air, water, earth, and fire are formed by merging natures, which are independent and bodily actual elements.[20]

first principles (hot, cold, moist, dry)
↓
four elements (fire, water, air, earth)
↓
three genera (stones, plants, and living things)

Two of these four qualitative arches are active (*fā'il*), and the other two are passive (munfa'il). The active elements are hot and cold, and the passive ones are dry and moist. Hot is active, dry is passive, cold is active, and moist is passive. The active elements manage the merging process, and the passive accompanies it according to the object formed by merging.[21]

16 Ede, *The Chemical Element*, 23-27.

17 Haq, *Names, Natures and Things*, 57.

18 Cihat İzci, Mehmet Demirtaş, "Câbir Bin Hayyân Metafiziğinde "Oluş" Düşüncesi," *Tokat İlmiyat Dergisi* 8/2 (2020), 798.; Cihat İzci, "Câbir Bin Hayyân Felsefesi" (Yüksek lisans tezi, Gaziosmanpaşa Üniversitesi, 2020), 92-93.

19 Haq, *Names, Natures and Things*, 59.

20 Haq, *Names, Natures and Things*, 60.

21 İzci, *Câbir Bin Hayyân Felsefesi*, 93.

> From now on, we say: The first principles are four, and they are hot, cold, moist, and dry. Two of them are the actives, and two of them are passives of the actives. Hot is the active, and the passive of these four principles is dry. Cold is the active, and of these four principles, its passive is moist. Cold and hot never gather in the same place (position). If both dissolve in the same body, one of them dissolves after the other [in this body] and becomes the counterpart of the other. What we say about moist and dry is the same as what we say about hot and cold.[22]

The four qualitative natures are found in different beings in different quantitative and qualitative proportions.[23] Qualitative natures differ in terms of quality as well as quantity in existence. In this sense, not all instances of "hot" or "cold" are of the same nature. Jābir explains this situation in terms of first nature as follows:

> Natures differ according to individuals in species. The hot in humans is different from the hot in the narcissus plant. However, the hotness, coldness, dryness, and moistness in all animals and their species and in all individuals of the species are the same in the species of stones, in all individuals of the species; in plants and their species, in all species and individuals.[24]

Jābir accepts that practically all bodies have all four qualities. When we say that an object is hot or cold, it simply means that hot or cold dominates the other three. He also states that the qualities of the same genus are also quantitatively different from each other. This understanding also explains the diversity in creation in Jābir's system.

> "The ratio of the hot in the quality is not equal to the hot in the substance. For example, the plant asarum is hot-dry, and pepper is not like it, although it is hot-dry. Although their qualities are similar to each other, their substances are different. If they agree on the quantity - I mean to be in the same degree - the situation is the same. Myrrh is third in hotness and dryness, and so is pepper. (In this case) they agree only on quantity and quality. The two are similar regarding vegetation, quality, and quantity, but there is another position between them. This is the completion of their shape (*istitmām al-shakl*), because those with the same definition (*ḥadd*) are the same in substance and accident. Know this."[25]

22 Jābir ibn Ḥayyān, "Kitāb al-Sabʿīn," *Mukhtār rasā'il Jābir ibn Ḥayyān*, ed. Paul Kraus (Cairo: Maktabat al-Khancī, 1354/1935), 462.

23 İzci, *Câbir Bin Hayyân Felsefesi*, 94.

24 Jābir ibn Ḥayyān, Kitāb al-Tajmīʿ, 228, Kitāb al-Raḥma, s. 585-586, qu. İzci, *Câbir Bin Hayyân Felsefesi*, 95.

25 Jābir ibn Ḥayyān, "Kitāb Ikhrāc mā fi'l-Quwwa ila'l-Fiʿl," *Mukhtār rasā'il Jābir ibn Ḥayyān*, ed. Paul Kraus, (Cairo: Maktabat al-Khancī, 1354/1935), 74.

The four qualities are the first simple elements (*al-ʻanāṣir al-basāʾiṭ*/ *al-basāʾiṭ al-uwal*) of all bodies. These are uncombined entities (*mufradāt*). Of these, the first compound elements (*al-murakkabāt*) – air, water, earth, fire – come into being.[26] When hotness is connected with dryness, fire is formed; when it is connected with moistness, air is formed; when coldness is treated with moistness, water is formed; and when it is treated with dryness, earth is formed. Hotness can never be treated with coldness. Jābir sometimes calls them "second elements" (*ʻanāṣir thawānin*).[27] Specifically, the qualities combine with substance in pairs to form one of the four Empedoclean elements.

fire = hot + dry + substance
earth = cold + dry + substance
air = hot + moist + substance
water = cold + moist + substance

> Fire occurs when hot is coupled with dry. As much as the amount of the thing dissolved in the body due to hot and dry, this thing is in the nature of fire or out of it, but it is also in fire type. If hot is treated with moist, air is formed first. Even if it is something other than it [air], it is still in the nature of air. In other words, starting from all these existents, the body becomes as close to this element as the elements dissolved in every body, and this element becomes its principle. It is like air, and air has its principle [hot]. Know this. Hot is never treated (processed) by cold, and cold is never treated by hot. These are processes of hot, know these.
>
> As for the processing of cold, know that if it is processed with moisture, water, and everything in the nature of water, it occurs. If it is not in the water nature, the body is processed by the amount of the body in the water nature, and this body is attached to it as much as the amount of cold and moisture. Know this. Cold is treated with dry. The first thing that is formed by the combination of these is the earth and everything in the nature of the earth. The most powerful thing that comes from it is the earth. Know this.
>
> If these principles get mixed up (*maze*), and if each of these accidents is attached to the body, the apparent one emerges and informs that man has the power to do the operations of nature. The most secret example of this is to return things to their nature (*kiyān*), one of which is the melting process.[28]

26 Haq, *Names, Natures and Things*, 59.

27 Jābir ibn Ḥayyān, "Kitāb al-Sabʻīn," *Mukhtār rasāʾil*, 482.

28 Jābir ibn Ḥayyān, "Kitāb al-Sabʻīn," *Mukhtār rasāʾil*, 462-463.

These Empedoclean bodies could be decomposed into natures. According to Jābir, we can remove hot from fire and reduce fire to pure dry. This removal of hot does not cause the appearance of cold. Indeed, there are only hot or cold; only dry or wet bodies. Unlike Jābir's system, in Aristotle's system, matter consists of four elements: earth, water, air, and fire. Everything can ultimately be reduced to these four basic and primary principles. Differences between things are explained by the fact that they contain these elements in different proportions. Aristotle also characterizes each element with two qualities: hot, cold, dry, and moist. Since opposite qualities – hot and cold, dry and moist – cannot exist in the same element, there are four possible combinations: fire (hot and dry); air (hot and moist); water (cold and moist); earth (cold and dry). For Aristotle, these "qualities (natures)" are an integrated part of the element. Nothing "hot" or "dry" can be separated from the fire element. In Aristotle's system, each element is characterized simply by one quality: earth with dry, water with cold, air with moist, and fire with hot. There is only one affection in every elementary body. When fire, for example, is deprived of heat, its opposite quality, cold, always appears. Fire, which is hot and dry, becomes earth, which is cold and dry. However, Jābir has given "natures" an existence outside of the elements. Hot and dry exist independently of fire. In fact, the fire element is the result of the combination of the hot and dry "nature" with the "substance." Hot air can be removed from the fire, and in this way, the fire can be reduced to pure dry air. Removing a quality (nature) from the object does not cause the appearance of the opposite quality (nature). It is possible to reduce the formation of bodies to a single nature.[29] Jābir explains these processes as follows:

> …and then cold, moist, hot and dry are removed, which is the first goal. We have already spoken about achieving pure cold. According to this saying, the cold must be removed from the water and earth to the farthest point. The more you repeat the *taṣʿīd* process, the more qualified and powerful it will be in terms of dyeing and processing (*ʿamal*). The aspect of the *tadbīr* is that you put the water in the distillery and leave in the distillery something that has a strong dryness, such as sulphur or similar substances. Thus, dry and hot dries moist and burns moist inside. Only cold remains. Use this. In the same way, switch to the moist in the paint. You simply get it out of it [paint] because there is no moisture in anything but paint and water. When you remove the cold of the water, its moist is burned, while the moist remains in the paint. Remove that [moist] from the paint and fire its hot. Thus, you reach two *rukn*s from natures. Treat hot and dry the same

29 Haq, *Names, Natures and Things*, 60.

> way you treat cold and moist. This [behavior] is to take the paint (*ṣibgh*), remove the hot and drive out the dry. Take the cold-dry earth, remove its dry, and drive away its cold, so you have reached the four principles from which all compounds are formed. Cold is removed from water, moist from paint, hot from fire and dry from earth. This is the right and good *tadbīr*.[30]

The element of water can be distilled in the laboratory until its cold "nature" is achieved; the air is distilled to obtain the moist. In the element of fire, the dry is removed to retain hot, and the earth is the source of the dry. These isolated "natures" are then recombined. The main job in alchemy is to isolate these "natures" and then work with them to produce the elixir.

> ...the first thing that consists of these elements in the substance and is loaded on it is the four *rukn*s. They are the second elements of the first, dirt-free and clean, and fire, air, water, and earth. Fire, on the other hand, is nothing but hot, dry and substance. Air is nothing but hot, moist and substance. The earth is nothing but cold, dry and substance. Water is nothing but cold, moist and substance. Know this, and if you want [to obtain] the elixir, do so based on it. This [elixir preparation method] is to get it by combining four *rukn*s.[31]

In the recipe given by Jābir to reduce the water to cold, when water is distilled with a strong dry substance such as sulfur, it loses its moisture, and only cold remains.

> The operation is carried out as follows. Your project (put) water into a distiller, where you place a strongly dry substance, such as sulfur or something similar. In this way, the moisture of the water will be dried by the dry of [sulfur] and the hot of [the fire of distillation]. The moisture will burn entirely and remain only isolated cold.[32]

The physical properties of these isolated natures are also specific. For example, hot is "red, not dull, bright, transparent," cold is "white, pure and salt-like crystal," moist is "sticky," and dry is "hard, dull and drying." Dry is "an atomic powder [*habā' lā juz' lahā*] that decreases in volume by shrinking [its] atoms and increases in volume by [their] expansion."[33]

30 Jābir ibn Ḥayyān, "Kitāb al-Sab'īn," *Mukhtār rasā'il*, 472-4.

31 Jābir ibn Ḥayyān, "Kitāb al-Sab'īn," *Mukhtār rasā'il*, 482.

32 Jābir ibn Ḥayyān, "Kitāb al-Sab'īn," *Mukhtār rasā'il*, 473:3-5, qu. Haq, *Names, Natures and Things*, 60.

33 Jābir ibn Ḥayyān, "Kitāb al-Sab'īn," *Mukhtār rasā'il*, 474:10-11, qu. Haq, *Names, Natures and Things*, 61.

> They said: The definition of dry in their eyes is that the quantity of something is meager in appearance. That is, if it spreads and becomes small pieces, if opened or crushed, it multiplies like dust particles. If you drop it again, it will gather. It is dry and very tight. And this is the end. This is the first target of the processed ones.[34]

> As for what the philosophers say about the first major operation (*al-tadbīr al-aʿẓām*), if the cold is removed from it, the definition [of the process applied] to the water is that it is repeatedly distilled until it becomes white and purified. When removed from the distillery, it freezes into salt-like pieces. This is the end of the operation. The definition for removing moist is distillation until something extremely sticky emerges from it [water]. This stickiness is a constant moistness. Its feature is that it never freezes. If the heat of fire hits it, it dissolves and becomes air, but this takes a long time. The definition of hot in operation (*tadbīr*) is to reach the formation of a pure, extremely red, not faint, bright, transparent body by itself. Dry is an extremely solid, dark-colored, dry, or dust granule that decreases when collected, multiplies when separated, and has no particles.[35]

In Jābir's system, the emergence of the first qualitative natures and elements into existence is possible with substance. Jābir's substance does not need a subject: it is the first subject. The alchemist thus identifies substance with matter.[36] Jābir's substance has the properties of both Aristotle's substance and his matter. This substance was simple (*basīṭ*) and unique (*wāḥid*), able to take all forms.[37]

> Substance is that which can receive everything [i.e. all categories of being]. It is in everything and everything arises from it and everything returns to it. Our Almighty Creator, our Lord, created it this way and placed it in everything. Everything turns to it.[38]

The substance of Jābir exists independently, is concrete and differentiated, and is visible – in the case of the natural world – even though it is not corporeal in itself:[39]

> ... Know that the color of the substance we are explaining is not (in fact) its color. This color originates from the relationship between it and the sun. Otherwise, as we said, no one can reveal the substance.[40]

34 Jābir ibn Ḥayyān, "Kitāb al-Sabʿīn," *Mukhtār rasā'il*, 475.

35 Jābir ibn Ḥayyān, "Kitāb al-Sabʿīn," *Mukhtār rasā'il*, 474.

36 Haq, *Names, Natures and Things*, 53.

37 Haq, *Names, Natures and Things*, 54.

38 Jābir ibn Ḥayyān, "al-Mīzān al-Ṣaghīr," *Mukhtār rasā'il Jābir ibn Ḥayyān*, ed. Paul Kraus (Cairo: Maktabat al-Khancī, 1354/1935), 428.

39 Haq, *Names, Natures and Things*, 54.

40 Jābir ibn Ḥayyān, Kitāb al-Mawāzīn al-Saghīr, p. 204 ff., qu. İzci, *Câbir Bin Hayyân Felsefesi*, 98.

In fact, the substance is what some call *hayūlā* (*hulê*):

> This is the substance that forms the founding framework of the world. A group of people call it *hayūlā*.[41]

Substance is the "fifth principle":[42]

> The four natures – hot, cold, moist, and dry – are the principle of everything. There is a fifth principle for these natures, namely the simple substance (*al-jawhar al-basīṭ*) called *hayūlā*.[43]

> The principles of things is four natures, and there is a fifth principle to it, and it is the simple substance called *hayūlā* and *habā'*, with which the interstices (*khalal*) is filled. It appears to you when the sun falls on it and it is called *nafs*. Know this. Shapes and forms and all dissolved things are gathered in it. It is the principle of all compound (murakkab) and the compound (murakkab) is its principle. It is the principle of the whole and remains until a certain time.[44]

Jābir says that substance is what fills the space/ interstices between physical objects. He then equates the substance with the scattered (dispersed) dust:[45] "Substance is diffused dust (*al-habā' al-manthūr*) ..."[46] *Habā'* (particles of dust) becomes visible only by a ray of sunlight; otherwise, it remains invisible. It cannot be held in the hand and cannot be perceived by any other sense than sight.[47]

> No one can perceive substance with the sense of touch. Even if someone comes into contact with it, they will not find it perceptible by touch. No one can hold the substance with their hands. ...[48]

One of the fundamental questions at the core of the system in Jābir's alchemy is how the immaterial turns into corporeal and the simple into compound. In other words, the material world consists of compounds, whereas nature does not change.

41 Jābir ibn Ḥayyān, "Taṣrīf," *Mukhtār rasā'il Jābir ibn Ḥayyān*, ed. Paul Kraus (Cairo: Maktabat al-Khancī, 1354/1935), 407.

42 Haq, *Names, Natures and Things*, 54.

43 Jābir ibn Ḥayyān, "Kitāb al-Sab'īn," *Mukhtār rasā'il*, 482.

44 Jābir ibn Ḥayyān, "Kitāb al-Sab'īn," *Mukhtār rasā'il*, 481-4.

45 Haq, *Names, Natures and Things*, 55.

46 Jābir ibn Ḥayyān, "Taṣrīf," *Mukhtār rasā'il*, 407.

47 Haq, *Names, Natures and Things*, 56.

48 Jābir ibn Ḥayyān, "al-Mīzān al-Ṣaghīr," *Mukhtār rasā'il*, 427.

These compounds can be transformed in various ways by manipulating the balance of natures. Jābir explains the formation of material objects in terms of the progressive descent doctrine central to Neoplatonist metaphysics. At the root of the formation of the corporeal world lies the "Desire of the Soul" (*shahwa*[49]*, shawq*[50]*, tawqān*[51]), which endows the substance with the power to shape. To understand this transformation and organization, examining the hierarchy of concentric spheres (*aflāk*, sing. *falak*) and Jābir cosmology would be appropriate.[52]

Jābir's cosmology presents the universe as a hierarchy of concentric spheres (*aflāk*) under the three Plotinian hypostases.[53] These hypostases are the First Cause (Demiurge-Creator, *al-Bārī'*), Intelligence (*al-'Aql*), and Soul (*al-Nafs*).[54] After the third hypostasis comes the first sphere (*falak*), usually represented as a circle. This sphere encompasses our world: "This circle is the Supreme Luminous Falak (*al-falak al-munīr al-a'ẓam*), and it is called the sphere that surrounds the world we live in (*al-falak al-ḥāwī al-'ālam allaẕī naḥnu fihi*)."[55] In fact, this Supreme Falak (*al-falak al-a'ẓam*), which is defined by the *Ether* and forms the border between the three hypostases and the natural world, is the substance world (*'ālam al-jawhar*).[56]

> As for the substance, God bless you, it is what fills the interstices (*al-mamlū' bihī al-khalal*). It has the ability to take any form. Everything is in it, made of it, and returns to it. If this description does not allow you to understand what substance is, then [let me explain this further] it is dust (*al-habā'*) and its color is somewhat white. And when the sun shines on it, it flares up and becomes visible. Then you should know that; it is the mass (*jirm*) of the Supreme Luminous Sphere, praise be to its Creator and blessed be His name. This is the body found in the three kingdoms of nature: animals, plants and stones.[57]

49 Jābir ibn Ḥayyān, "Kitāb Maydān al-'Aql," *Mukhtār rasā'il Jābir ibn Ḥayyān*, ed. Paul Kraus (Cairo: Maktabat al-Khancī, 1354/1935), 211:3; 212:4; 213:10, 11, qu. Haq, *Names, Natures and Things*, 58.

50 Jābir ibn Ḥayyān, "Kitāb Maydān al-'Aql," *Mukhtār rasā'il,* 211 :15; 213: 11, qu. Haq, *Names, Natures and Things*, s. 58.

51 Jābir ibn Ḥayyān, "Kitāb Maydān al-'Aql," *Mukhtār rasā'il,* 212:2, qu. Haq, *Names, Natures and Things*, 58.

52 Haq, *Names, Natures and Things*, 58.

53 Haq, *Names, Natures and Things*, 54.

54 Jābir ibn Ḥayyān, "Taṣrīf," *Mukhtār rasā'il*, 392-424.

55 Jābir ibn Ḥayyān, "Taṣrīf," *Mukhtār rasā'il,* 412.

56 Jābir ibn Ḥayyān, "Taṣrīf," *Mukhtār rasā'il,* 408.

57 Jābir ibn Ḥayyān, "al-Mīzān al-Ṣaghīr," *Mukhtār rasā'il*, 429.

In Plotin's hierarchical descent [One (*to hen*) → Intelligence (*nous*) → Soul (*psychê*) → Matter (*hulê*)] each intermediate step has something from both sides. Jābir's supreme luminous sphere (*al-falak al-munīr al-aʿẓam*) also shows an intermediate character suitable for the place in the middle of the rational and material world. This is where it lays out, serving as the link between the first three hypostases and the "world we live in". On one side of the Supreme Sphere are the three Plotinian hypostases, and on the other side is what he calls the "world of the simple elements" (*ʿĀlam al-ʿAnāṣir al-Basāʾiṭ*) (Fig. 1). The term "simple elements" here refers to the four qualities – hot, cold, moist, and dry – not Empedoclean bodies.[58] These qualities – simple elements – are differentiated and independent.[59] The Supreme Sphere is represented by a circle. At the same time, the World of the Simple Elements is a smaller concentric circle contained within it. In this Supreme Sphere (*al-falak al-aʿẓam*), a cosmological process makes the substance visible. It gives it a form and a distinct color. At some stage in the complex hierarchy of concentric spheres, below the Supreme Luminous Sphere, the Soul also provides the substance with a geometric form that is necessarily spherical. Originating from Desire, this spherical substance attaches itself to one of the four discrete qualities where it becomes a corporeal body.[60]

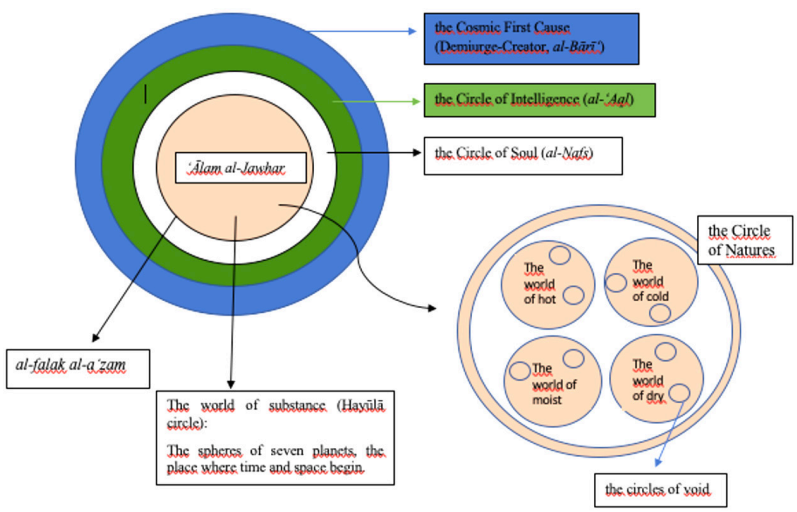

Figure 1: Jābir's cosmological scheme

58 Jābir ibn Ḥayyān, "Taṣrīf," *Mukhtār rasāʾil,* 392-424.

59 P. Kraus, *Jābir ibn Ḥayyān Contributions a l'Histoire des Idees Scientifiques dans l'Islam II: Jābir et la Science Grecque* (Cairo, Memoires de l'Institut d'Egypte, 1942), 135 ff.

60 Haq, *Names, Natures and Things*, 58.

Thus, in the universe, substance first appears as intangible in the illuminating and greatest sphere that surrounds the world we live in, and then turns into matter by taking a specific form and color. As a result, the principal being is a simple substance at the immaterial level. At the material level, it is unified, mobile, and related to time and space (subject to becoming and transformation). When it is in the first level, it is the soul as a potential, and the body when it is in the act. Thus, the body is the form of this non-sensible and intelligible spiritual essence transformed into the sensible.

Spiritual substance = soul, spirit
Material substance = body (corporeal substance)

With this approach, Jābir's cosmology has also understood a single principle. According to this philosophy, contrary to the thought in the tradition of Aristotle, the most valuable being is neither the soul alone nor the corpse alone, but the being created by the soul and the corpse together.

As stated before, a cosmological process occurs in the Supreme Sphere (*al-falak al-aʿẓam*), making the substance visible and giving it a form and a distinct color. In the embodiment stage, the substance is in the position of matter, which is the carrier of the four elements in the first stage, and ensures their embodiment. So anything has dimensions and nine categories.

> First, we visualize an empty region of space. Next, we imagine that the substance takes on form and becomes a figure there. This figure can only be spherical. Next, we [imagine] that this mixture [substance + form] is bound to one of the four isolated natures [i.e. elementary qualities][61]

Inside the concentric spheres is another sphere called the void (*khalā'*). According to *Kitāb al-Mīzān al-Ṣaghīr*, *khalā'* is the place where the substance differentiates, and this is where the qualities are attached to it.[62] This process is explained in more detail in *Maydān al-ʿAql*.[63] Thus, the substance passes from the void (*khalā'*) to the world of fundamental qualities, according to the Desire of the Soul, and is loaded with different amounts of hot, cold, dry, and moist. When the substance receives a

61 Jābir ibn Ḥayyān, "Kitāb Maydān al-ʿAql," *Mukhtār rasā'il*, 207, qu. Haq, *Names, Natures and Things*, 58.
62 Jābir ibn Ḥayyān, "Taṣrīf," *Mukhtār rasā'il*, 392 ff., "al-Mīzān al-Ṣaghīr," *Mukhtār rasā'il*, 425 ff.
63 Jābir ibn Ḥayyān, "Kitāb Maydān al-ʿAql," *Mukhtār rasā'il*, 211:14 ff.

certain amount of cold, its capacity to absorb other qualities decreases. Beneath the void of Jābir, both substance and qualities are corporeal entities. All objects of the natural world are ultimately born out of the binding of qualities to substance. And in this way, Jābir begins to explain the entire natural world in terms of four fundamental qualities.[64]

> We say: When *Allah tabāraka wa ta'ālā* created the sphere, He created the four elements in it: fire, water, air, and earth. The essence of [these elements] is that when the first elements enter into mixing, each of them is added to the center of it [of the sphere] – this is after it uses the substance – the fire merges by the rising, and the [ascension] becomes the center of it [fire]. And the air combined with fire because of the hot in it, and [combination] made it [air] incapable of reach, and fire incapable of mixing with moist ... Earth combined with water and fixed it with its dryness. Then the sphere rotated, and [while] the natures were weak, and [natures] worked the stones in the mines. Then it became stronger, and rotation increased, so trees and plants were cultivated [*in'imāl*]. Then it got stronger and turned with a full turn, and the animals were worked with it [*infi'āl*].[65]

All objects of the natural world are ultimately born out of the binding of qualities to substance. The diversity in existence emerges from the numerous qualities connected to the substance and the quantities of natures. In the final stage, the material substance unites with the soul (spiritual substance, spirit).[66] The movement of the material substance among the natures is provided by the soul contained in it. According to Jābir, the soul is a divine substance that is positioned by the substance surrounding the objects and resurrects the objects it surrounds.[67] There are two ways for nature to settle in the substance. In the first case, natures come into contact with the substance in an instant (*daf'atan wāḥidatan*), at once and quantitatively in balance, and this is the creation of God (First *Mīzān*). In the second case, it is an unbalanced union that occurs when natures are combined with substance only in successive steps (*daf'āt*), piecemeal, over a period of time, which is called secondary creation, art, alchemy, imitation of divine art (Second *Mīzān*).[68]

64 Haq, *Names, Natures and Things*, 59.

65 Jābir ibn Ḥayyān, "Kitāb al-Sab'īn," *Mukhtār rasā'il*, 460.

66 İzci, *Câbir Bin Hayyân Felsefesi*, 108.

67 İzci, *Câbir Bin Hayyân Felsefesi*, 110.

68 Haq, *Names, Natures and Things*, 208.

> We say: Undoubtedly, natures are loaded into the substance in a single time - which we have explained as an example of *al-Bārī*'s *'azza wa jalla* creation – or else the latter is our act in the substance, which is to load natures into the substance several times.[69]
>
> (Then) the word is this: Substance carries natures either at once, which we said can only be done by *Bārī' ta'ālā*. The other option is the case of loading natures more than once, which can be done with our actions. The first is pure. We can reach the measure of this, but we cannot purify it by operations. We can both learn the measure of the second and purify it. Both are included under genus and species, subtract from genus and species in compound and discrete forms.
>
> The state of natures loaded in one go is as we said. Allah has allowed these natures to encompass the substance in terms of time and space in any way it wishes. To better understand this situation (we say) if one of the two actives takes the upper part of the substance, the other will settle in the lower part. If one of the two passives takes the length, the other takes the width. This thing happens just like the action of our Lord. Mind the Lord's business! How he gave the opportunity to do what he wanted with the natures in terms of quantity, quality, time, space and substance, and then left them incapable of being able to do what he wanted![70]

In *al-Mīzān al-Ṣaghīr*, Jābir mentions that the second creation is a similar process to the first, represented by the art.[71] Thus, Jābir accepts that not only plants and animals, but also humans can be created artificially by the hand of the artist, through the art and based on the science of balance. His *Tajmīʿ* is devoted to this very topic. The work in question is a work in which he gives the actual laboratory procedures used to carry out such a formation.

We see that Jābir reiterates in *Kitāb al-Aḥjār* that the artificial formation of organic and inorganic bodies is within the competence of man:[72]

> Balīnās claimed that living things, plants, and stones each have a characteristic *Mīzān* that was created in the First Generation (*al-kawn al-awwal*) accomplished by *Allah 'azza wa jalla*. He also claimed that living things have a *Mīzān* besides the First, the situation is the same for [plants] and stones, and this Second *Mīzān* is up to us. Know this![73]

69 Jābir ibn Ḥayyān, "al-Mīzān al-Ṣaghīr," *Mukhtār rasā'il*, 444.

70 Jābir ibn Ḥayyān, Kitāb al-Mawāzīn al-Saghīr, 216-7, qu. İzci, *Câbir Bin Hayyân Felsefesi,* 113.

71 Jābir ibn Ḥayyān, "al-Mīzān al-Ṣaghīr," *Mukhtār rasā'il*, 449.

72 Here, Jābir attributes this belief to Balīnās (Appolonius of Tyana, circa 3 BC – circa 97 AD). This is surprising, for there is no trace of such discipline in any work we know so far of the writings attributed to Balīnās. *See* Haq, *Names, Natures and Things*, p. 203, 208.

73 Jābir ibn Ḥayyān, "Kitāb al-Aḥjār," *Names, Natures and Things: The Alchemist Jābir ibn Ḥayyān and his Kitāb al-Aḥjār* (*Book of stones*), Syed Nomanul Haq (Dordrecht: Kluwer Academic Publishers, 1994), 121.

In Jābir's system, man can imitate creation (the attachment of natures to material substances) and make transformation (transmutation) possible by discovering how the divine modes of creation are.

> As for the second kind of art - the one we practice - you must have knowledge about it. Firstly, determine the time of the thing you want to compose, then the place. Or first the place and then the time, it is up to you. Then, the quantity and quality are determined to attach to the nature of the substance. Do not keep one more or less than the other. Then, firstly, compose one of those that will be dominant, which will be the inner part (*bāṭin*). Do not put the outer part (*ẓāhir*) first, that would be a great mistake. Then, compose one of the two passive ones suitable for its function. Then compose the body (*jasad*), which is the outer part (*ẓāhir*), and add the subject to it, just as you did for the inner part. Thus the thing comes into existence from non-existence.[74]

> It has been established from our previous words that the four principles – fire, water, air, earth – have an effect on the bodies of the three genera [stones, plants, living beings] and are effective and useful for coloring (*ṣibgh*). We do not see any [possibility of] action for any of these three genera other than these elements. For this reason, our basis in this art is the action of the elements. We strengthen their weaknesses, weaken their strengths and correct their defects. Whoever has attained the operation of the elements of the three genera has attained the knowledge of everything and has realised the science of creation and the art of nature.[75]

Jābir's answer to the question, "How can you perform such an operation on man?":

> Whereupon the naturalists said: "You have already accepted that we can act on stones, trees, and other living things other than human beings. Otherwise (if you do not accept this), we have already provided evidence in this regard." They said, "Yes". Then the naturalists said: "Since all of the genera are one in the principle, but the forms are different, the principle is the agent for all of the genera. When you accept this for one of the genera, it is valid for all. If you do not accept this, you invalidate your own word."[76]

One of the crucial aspects in Jābir's system was the separation of supernatural and human creation. God had created the world through His creation of nature, but since material elements are secondary, they fall within the scope of the mundane and can, therefore, be "created" by humans. Thus, as long as it was the elements and not nature that the alchemist created, it would not be a violation against God to do alchemy.

74 Jābir ibn Ḥayyān, Kitāb al-Mawāzīn al-Ṣaghīr, 216-7, qu. İzci, *Câbir Bin Hayyân Felsefesi*, 113.

75 Jābir ibn Ḥayyān, "Kitāb al-Sab'īn," *Mukhtār rasā'il*, 481.

76 Jābir ibn Ḥayyān, "Kitāb al-Sab'īn," *Mukhtār rasā'il*, 461.

In his system, Jābir defines the species we today call metals as "corpses." In Jābir's system, corpses (*ajsād*) are the sum of their bodies (*ajsām*) and spirits (*arwāh*). Their bodies are not separate from their spirits, and their spirits are not separate from their bodies. Anything whose spirit is united in balance with its body becomes a corpse.

> Corpses (*ajsād*) are a whole of their bodies (*ajsām*) and spirits (*arwāh*). Their bodies are not separate from their spirits, and their spirits are not separate from their bodies. Formation (*kawn*) and mixture (*mizāj*) provide a complete connection between the spirits and bodies, and as a result, what is known as the "ājsād" is formed. Corpses (*ajsād*) are 7 in number, and they are malleable. This is because everything whose spirit is united with its body in balance becomes a corpse.[77]

> Bodies are formed by the mixing of spirits and corpses in their mines without a complete mixture (*mazj*). They fly and remain fixed; what flies from them (the flying parts) are their spirits, and what dissolves from them are their corpses. They are separated from each other by a chemical process (*tadbīr*) because they are not mixed with a complete temperament (*mizāj*). These are marcasite, magnesia, *dahnaj* (copper stone/malachite), lapis lazuli, and iron slag (*dawṣ*). Know these and act upon this knowledge. This knowledge is the knowledge about stones.[78]

With this approach, alchemy is the process of incorporating spirits into corpses. This is achieved by coloring the corpses with spirits. The remarkable point here is that durability and continuity are defined as properties belonging to the corpses. What belongs to the spirit is only the "coloring" property.

> As far as the essence is concerned, you should know that colors belong to spirits. Because of the spatial expansion of their spirits and the small number of their corpses, they need more area than their spaces. One dirham of mercury covers twenty dirhams of copper so that the color of both becomes white. One dirham of sulfur covers two dirhams of copper, and twenty dirhams of it change the color of copper from its natural color to blue. And one dirham of <...>[79] covers silver, copper, and gold because it covers more than its quantity. Bodies comprise spirits and corpses; some bodies are covered, and others are not. Dye belongs to the spirits because of its breadth, while durability and continuity belong to the corpses. Corpses hold the spirits (bind and restrict them). Whoever can include the spirits in the corpses will be able to perform the process of the art and bring the potion that is potential into actuality.[80]

77 Jābir ibn Ḥayyān, "Kitāb Ikhrāc mā fi'l-Quwwa ila'l-Fi'l," *Mukhtār rasā'il*, 62.

78 Jābir ibn Ḥayyān, "Kitāb Ikhrāc mā fi'l-Quwwa ila'l-Fi'l," *Muḫtāru resā'ili*, 64.

79 Missing part in the text.

80 Jābir ibn Ḥayyān, "Kitāb Ikhrāc mā fi'l-Quwwa ila'l-Fi'l," *Mukhtār rasā'il*, 64-65.

Spirits, that is, substances that volatilize when put on fire, such as mercury, *zirnīkh* (arsenic sulfide), sulfur, *nushadir* (ammonium chloride), camphor, and oil, are divided into three parts due to the differences in their essences:

1) Volatile, non-flammable but miscible
2) Volatile, non-flammable, and non-miscible
3) Volatile, flammable, and miscible

The first group contains only mercury. In the second group, *nushadir* and camphor are used. In the third group there are sulfur, *zirnīkh* and oil. These substances are souls (*nufūs*) because each of them is oil (coloring).[81]

In alchemy, the natures of the 7 corpses are also matched with the nature of the planets. Lead (*usrub*) is in the nature of Saturn, Tin is in the nature of Jupiter, Iron is in the nature of Mars, Gold is in the nature of the Sun, Copper is in the nature of Venus, Silver is in the nature of the Moon, Khārṣīnī is in the nature of Mercury. In his *Kitāb Ikhrāj mā fi'l-Quwwa ila'l-Fi'l*, Jābir explains the formation of metals as a result of formation (*kawn*) and mixture (*mizāj*) as follows:

> Formation (*kawn*) and mixture (*mizāj*) ensure the complete connection between spirits and bodies, and as a result, what is known as "ajsād" is formed. Corpses (*ajsād*) are 7 in number and they are malleable. This is because everything whose spirit is united with its body in balance (*i'tidāl*) becomes a corpse.[82]

The bodies of Jābir are formed by the mixing of spirits and corpses in their mines without a complete mixture (*mazj*). They fly and remain fixed; what flies from them (the flying parts) are their spirits, and what dissolves from them are their corpses. Spirits and corpses are separated from each other by chemical processes because they are not mixed with a complete temperament.[83]

> Corpses hold the spirits (bind and restrict them). Whoever can incorporate the spirits in the corpses will be able to perform the process of the art and bring the potion that is potential into actuality. Bodies are not spirits and corpses, but they are a combination of them, that is, of spirits and corpses. Indeed, they (bodies) are closer to the essence of art than spirits alone and corpses alone. Spirits, corpses and bodies each stand in their pictured (determined) positions and areas.[84]

81 Jābir ibn Ḥayyān, "Kitāb Ikhrāc mā fi'l-Quwwa ila'l-Fi'l," *Mukhtār rasā'il*, 61.
82 Jābir ibn Ḥayyān, "Kitāb Ikhrāc mā fi'l-Quwwa ila'l-Fi'l," *Mukhtār rasā'il*, 62.
83 Jābir ibn Ḥayyān, "Kitāb Ikhrāc mā fi'l-Quwwa ila'l-Fi'l," *Mukhtār rasā'il*, 64.
84 Jābir ibn Ḥayyān, "Kitāb Ikhrāc mā fi'l-Quwwa ila'l-Fi'l," *Mukhtār rasā'il*, 65.

All this physical existence is subject to the senses, making chemical processes possible. In his work, Jābir also defines the quality and its types in alchemy. Quality is the process (*tadbīr*) of art (alchemy). Without quality, there would be no art, and it (quality) is a tadbīr. The quality is of four types: for corpses (*ajsād*), for spirits (*arwāḥ*), for the mixture (imtizāj), and for the projection (*ṭarḥ*), and these four processes are the true art.[85]

Jābir also divides the *tadbīr* of spirits into three parts: *taṣʿīd* (sublimation), *ghasl* (washing), and the sum of these two (*taṣʿīd* and *ghasl*). *Taṣʿīd* (sublimation) cleans the dirt and impurities of the spirits and makes them suitable for the temperament (mixture). *Ghasl* removes their dirt, so that when they are placed on the fire, they no longer darken. In the sum of these two (*taṣʿīd* and *ghasl*), the spirits are first washed and then *taṣʿīd* is performed to whiten them. Thus it becomes pure.

> The scholars are divided into three groups about spirits' treatment (tadbīr). The first group said that the spirits should be elevated. Fire and mild *taṣʿīd* (sublimation) clean their dirt and impurities and make them suitable for the temperament (mixture). The second group said that the cleansing process is not by *taṣʿīd* but by *ghasl* (washing). The whitening of these spirits is not substantial but accidental. The proof of this is that when they (the spirits) are placed on the fire, they darken, turn yellow, or change to a color close to it. *Taṣʿīd* whitens by expanding (as the dripping whitens, especially the expanded one, by whitening in the air). *Ghasl* removes their impurities (from the end/others) so that they no longer darken when placed on fire. The third group thinks that the science (of art) is the sum of these two (*taṣʿīd* and *ghasl*). That is to say, it is washed to remove the burntness, and then *taṣʿīd* is done to whiten it so that it becomes pure. The processes of *ghasl* (washing) and *taṣʿīd* combine two benefits, the first to purify and the second to whiten. Thus, in logic and rational sciences, what is beneficial in two ways is more favorable than what is beneficial in one way. This knowledge is from the procedures related to the spirits. You should also know that during the process, the one who is not burnt needs a more intense fire, and the one who is burnt needs a soft and gentle fire. This information is about the spirits. When they are purified (become pure), they need *ḥall* (dissolving) and *ʿaqd* (binding/coagulation). ... This information is about the spirits.[86]

Jābir draws attention to the fact that mercury is among the spirits in the discussion of corpses. Mercury is neither a body nor a corpse. Thus, in Jābir's system, the spirit finds a place with the definition of being subject to reason.

85 Jābir ibn Ḥayyān, "Kitāb Ikhrāc mā fi'l-Quwwa ila'l-Fi'l," *Mukhtār rasā'il*, 66.

86 Jābir ibn Ḥayyān, "Kitāb Ikhrāc mā fi'l-Quwwa ila'l-Fi'l," *Mukhtār rasā'il*, 66-67.

> Thus, mercury is among the spirits and not among the bodies and corpses. A people who had no knowledge of alchemy pointed to it and said: it is a corpse and not a corpse, it is volatile and not volatile.[87]

With this system, Jābir explained one of the most perplexing problems concerning the formation of metals in the theory of matter. Metals and metal ores were found primarily as veins in different rock types. This raised questions about the formation of metals. Here, we encounter Jābir's most influential doctrine, the "mercury-sulfur theory." This theory represents the belief that metals are formed in the earth by the mixing of sulfur and mercury. After Jābir it strongly permeated the theory and thought of Art (*al-Ṣan'a*) and became one of the fundamental principles of alchemical thought.[88] The mercury-sulfur theory has a long history before Jābir and originates with Aristotle (384-322 BC). According to Aristotle, two "exhalations" emanate from the earth's center. One of these exhalations is dry and smoky, the other wet and vapourous. These exhalations condense underground and form stones and minerals. Traces of the mercury-sulfur theory appear later in Zosimos (3-4th century) and in the so-called *Kitāb Sirr al-Khalīqa* of Balīnās.

According to Zosimos, metals are composed of two parts: a non-volatile part he called "body" (*sōma*) and a volatile part he called "spirit" (*pneuma*). Just as the individuality and personality of a human being reside not in the body but in the spirit, metals derive their unique nature and identity not from their sōma but from their pneuma. The spirit gives the metal its color and other specific properties, while the body is the same in all metals. Zosimos equates the body with the liquid metal mercury.[89] The mercury-sulfur theory in the Sirr al-Khalīqa, an important source often consulted by Jābir, states that all metals, as seen in Jābir, are compounds of two principles called mercury (corresponding to Aristotle's wet exhalation) and sulfur (corresponding to the smoky exhalation). These two principles condense underground and combine in different proportions and amounts of purity to form various metals.[90] Sulfur and mercury, as the "father" and "mother" of the metals "growing" in the soil, expressed the basic biological animism of this world of "generation and corruption." Identified with the sun and the moon, they represented the influence of the heavens

87 Jābir ibn Ḥayyān, "Kitāb Ikhrāc mā fi'l-Quwwa ila'l-Fi'l," *Mukhtār rasā'il*, 63.

88 Ede, *The Chemical Element*, 23-27.

89 Principe, *The Secrets*, 16.

90 Principe, *The Secrets*, 35.

on this sublunar world. All metals are composed of the same sulfur and mercury, but the differences in metals are due to the different proportions of impurities contained in the sulfur and mercury. When these are entirely pure, gold is formed. If they are impure, other metals are formed. When these impurities, which are accidental qualities, are removed, gold is produced from the "impure gold" in other metals. In *Kitāb al-Sabʿīn*, Jābir explains this transformation as follows:

> And these qualities or natures in all beings and things are either manifest and perfect or occult and perfect, and every being or thing should have two manifest qualities or natures, active and reactive; and two occult qualities or natures, active and reactive. The meaning of perfect or imperfect is that silver according to them has an imperfect manifest nature and an ideal occult nature whereas gold has the opposite nature; and therefore it was easy for them to revert metallic bodies to their origin in the shortest time by reversing the natures of metallic bodies and making the occult manifest and the manifest occult.[91]

According to Jābir, each metal has a pair of external qualities and a pair of internal qualities (Table 1). Thus, for gold and silver, for example, the following table emerges:

Tablo 1
Inner and Outer Qualities

	Outer Qualities (Manifest)	**Inner Qualities (Occult)**
GOLD	Hot – Moist	Cold – Dry
SILVER	Cold – Dry	Hot – Moist

Accordingly, what must be done to turn silver into gold is to turn its nature from the inside out. If we take the coldness and dryness of silver, its warmth and moistness come out, and silver is transformed into gold.

> As for silver, its first origin was gold, but the coldness and dryness incapacitated it, and as a result, the gold passed into its inside, and the dominant nature became manifest, so that its outside became silver and its inside became gold. If you want to turn it into gold, take its coldness in, then its warmth will be revealed. Then take its dryness in, in which case its moistness is revealed and it turns into gold. This is about the operations of all objects.[92]

91 Ahmad Y. al-Hassan, "The Arabic Origin of Summa perfectionis magisterii And the Other Geber Latin Works VII: The Sulphur Mercury Theory and the Occult and the Manifest Principle Comparison of Geber Latin Texts with Jabir's Arabic", http://www.history-science-technology.com/summa/summa7.html (D.A. 29.05.2020).

92 Jābir ibn Ḥayyān, "Kitāb al-Sabʿīn," *Mukhtār rasāʾil*, 470.

> ...to know that in order for it to mature as desired and turn into a body that is not corrupted, you need to bring inside the two manifest elements in the bodies and take out the two occult elements, and this is their secret. In some of these bodies, it is necessary to take out an element from the inside and take it out and put inside the element that is opposite to it.[93]

Similarly, in the *Aḥjār*, Jābir says that lead only manifests itself to us as a base metal. The metal we call lead was only manifestly lead; the precious gold was latent. In it lies gold, which is hidden from people. But if what is hidden is extracted, the lead will turn into gold. Indeed, the alchemist's task in transmutation is nothing but manifesting what is latent.[94]

In keeping with his view that the four natures are the true material constituents of natural objects, Jābir even specifies the location of two complementary groups of natures in the physical objects; hence the *Tajmī'* tells us that the external natures are located at the periphery (*muḥīṭ*) of the body, and the internal natures are located in the inside (*bāṭin*), i.e. at the center. The classical idea of "red" and "white" metals is also smoothly and skilfully incorporated into this theory of alchemy. Thus gold, tin, and copper were red metals whose external nature was hot and dry; conversely, iron, silver, and lead metals were white and externally cold and moist.[95]

> These four elements are present in all existents in the world. It is separated from it by process (*tadbīr*). This is all that is about the process. If you want to increase its strength, first turn to the dripping water, which is cold and moist. Remove its coldness from its moistness. Take away its moistness. Thus, it remains cold without moistness. Then, turn to the *duhn* (oil) and remove its hotness so that it remains moist. Then, turn to the fire and remove its dryness. Thus, it remains hot. And turn to the earth and remove its coldness so it remains dry. Then, the principle from these is formed and processed with it.[96]

The main thing in the alchemical transformation is to strengthen the weak of the substances, weaken the strong ones and correct the defective ones.

> Our previous words have established that the four principles - fire, water, air, earth - affect the bodies of the three genera [stones, plants, living creatures] and are effective and useful for coloring (*ṣibgh*). We do not see [the possibility of] any action for any of these

93 Jābir ibn Ḥayyān, "Kitāb al-Sab'īn," *Mukhtār rasā'il*, 466-467.

94 Haq, *Names, Natures and Things*, 96.

95 Haq, *Names, Natures and Things*, 96.

96 Jābir ibn Ḥayyān, "Kitāb al-Sab'īn," *Mukhtār rasā'il*, 483-484.

> three genera other than these elements. For this reason, our mainstay in this art is the action of the elements. We strengthen their weaknesses, weaken their strengths, and correct their defects. Whoever has attained the operation of the elements of the three genera has achieved the knowledge of everything and has realized the science of creation and the art of nature. Do not be in doubt. The nature of every elixir is from them and with them. We put in the elixir a nature (*ṭabʿ*) that will prevail over the nature (*ṭabʿ*) that disturbs the state in the body.[97]

Consequently, in order to turn any metal into gold, it is necessary to know two things: the proportion of natures in that metal and the proportion of natures in gold itself. Only then can the appropriate elixir be prepared which will remove these particular "natures" and nourish the other natures. Thus, the ratio of the elements in the metal becomes equal to that of gold, and this metal, therefore, turns into gold. The problem is determining the constitution of the natures of the elements of any metal, including gold. Jābir's answer is the science of *mīzān*.[98]

The concept of *mīzān* (balance) is a doctrine of "quantitative relations", consisting mainly of speculations about the "balance (*mīzān*) of letters". The idea of the *mīzān* of letters is a kind of phono-symbolism in which the letters of the Arabic alphabet are attributed certain weights and qualities – in Jābir's words, "natures" (dryness, moistness, hotness, coldness). These letters correspond to the contents of minerals and metals in proportion to the forms in which the substances appear in their names.[99] Thus, the name of a particular metal, such as lead (*usrub*), reflects precisely the essence of that metal.[100]

In the natural world, to give merely an outline of Jābir's doctrine, all bodies contained the four qualities in a specific, immutable, and noble proportion which was governed by the Supreme Principle. This proportion was 1 : 3 : 5 : 8, whose sum 17 (= 1+3+5+8) was the foundation (*qāʿida*) of the entire Science of Balance. Thus, if in a body the qualities are arranged in the order hot, dry, cold, and moist, and if the hot weighs 1 unit, then dry will be 3 unit, cold will be 5 unit, and moist will be 8 unit. The

97 Jābir ibn Ḥayyān, "Kitāb al-Sabʿīn," *Mukhtār rasāʾil*, 481.

98 P. Zirnis, "The Kitāb Usṭuqus al-Uss of Jābir ibn Ḥayyān" (Doctoral Diss., New York University, 1979), 16.

99 P. Kraus, *Jabir ibn Hayyan: Contribution à l'histoire des ide´es scientifiques dans l'Islam* (Paris: Les Belles Lettres, 1942/1986), v.2, 223-236.

100 Karin Ryding, "Alchemy in Islam," *Encyclopaedia of the History of Science, Technology, and Medicine in Non-Western Cultures*, ed. Helaine Selin (Springer, 2016), 180-183.

alchemist who has mastered the Science discovers the quantitative structure of all things through this proportion. He can then change anything into any other by creating a new configuration of qualities.[101]

> First of all, you should know that a thing is characterized by this or that nature. This nature is indicated by a quality (*kayfiyya*). If you increase an opposite quality in this object, it undergoes transmutation and takes another form.[102]

He can even transform inanimate objects into living things. In the same way, Jābir reveals the internal structure of precious metals through the science of *mīzān* and then transforms the base metals into precious metals by giving the base metals the qualitative structure of precious metals. This is accomplished by enhancing the weaker qualities and suppressing the excessive ones.[103]

Jābir mentions the science of *mīzān* in his *Kitāb Ikhrāj mā fi'l-Quwwa ila'l-Fi'l* as follows:

> ... This is also from the category of similarity (*mumāthala*) and opposition (*muqābala*). It is either the *mumāthala* of a substance with a substance among many substances, or the *muqābala* of an act with an act that brings about the realization of a quality in a (different/other) substance among the substances.
>
> The similarity (*mumāthala*) is realized either by equating (*mu'ādala*) hot with hot, cold with cold, moist with moist, and dry with dry, as in simple beings, or by equating hot-moist with hot-moist, hot-dry with hot-dry, cold-dry with cold-dry, and cold-moist with cold-moist. This (information) is under the section of *mumāthala*.
>
> On the other hand, the opposition (*muqābala*) is the opposite of this balance (equality). In simple beings, hot is equated with cold, and moist with dry. In compound beings, on the other hand, hot-dry is equalized with cold-moist, and hot-moist is equalized with cold-dry. This (knowledge) is the first foundation of the science of *Mīzān*. This is such a knowledge that if we talk about *Mīzān* for a long time, it will be related to the knowledge we have mentioned and will not come out of it (aside). It (*Mīzān*) has conditions and rules.[104]

In Jābir's system, the balance of natures is achieved through the transformation of qualities, and the part is included in the whole both potentially and actually:

101 Haq, *Names, Natures and Things*, 67-68.

102 Jābir ibn Ḥayyān, "Kitāb Ikhrāc mā fi'l-Quwwa ila'l-Fi'l," *Mukhtār rasā'il*, 92.

103 Haq, *Names, Natures and Things*, 68.

104 Jābir ibn Ḥayyān, "Kitāb Ikhrāc mā fi'l-Quwwa ila'l-Fi'l," *Mukhtār rasā'il*, 91.

> You should know that the whole attracts the part, and the part is included in the whole potentially and actually. You should also know that the victorious (dominant) parts are of such a nature (*ṭab'*) that they absorb their opposites (opposite natures) towards the center of this thing and dissolve those around this thing. You should also know that if the parts (*ajzā'*) increase by four *martaba*, they return to the first *martaba* of the opposite nature.
>
> Again, it should be known that if a thing is of one nature, there is a quality in that thing that signifies the nature it is of. If the opposite nature increases until the first opposite is taken inside, the quality transforms into the second form. This is from the *mīzān* of natures.[105]

The Principle of Causality in Jābir's Alchemical System

Islamic alchemical thinkers and scholars, notably Jābir, were naturalists (*ṭabī'iyyūn*) who, while embracing the idea of a Creator, recognized Him only as the First Cause and the First Mover, and developed theories that explained all other events through a chain of causality that was independent and entirely self-operating through the internal processes of nature.[106]

Causality is a concept used to express the relationship between cause and effect. It describes a situation where the first event, fact, or phenomenon, called the "cause," leads to the second one, called the "effect," inevitably following within a specific time sequence.[107] Throughout the history of thought, causality has been understood in various ways. The Miletian philosophers, with a monist approach, focused on the material cause of everything that exists, while Empedocles emphasized the efficient cause and Plato the formal cause. However, Aristotle (384-322 B.C.) categorized and systematized causes under four headings: material, formal, efficient, and final causes. According to Aristotle, the existence of everything except God is based on these four causes. He argued that knowledge of a thing is only possible by investigating and identifying its causes.

Causality has been a central topic of discussion in philosophy and science since ancient times, playing a crucial role in efforts to understand and explain the universe and its physical systems and phenomena. Aristotle's theory of causality has often

105 Jābir ibn Ḥayyān, "Kitāb Ikhrāc mā fi'l-Quwwa ila'l-Fi'l," *Mukhtār rasā'il*, 91-92.

106 Hüseyin Sarıoğlu, *Ortaçağ Felsefesi II* (Eskişehir: Anadolu Üniversitesi Yayınları, 2013), 9-10; Burhan Köroğlu, "Tabiatçılar", DİA, 39 (2010): 327-328.

107 Ahmet Mekin Kandemir, *Mu'tezilî Düşüncede Tabiat ve Nedensellik* (İstanbul: Endülüs Yayınları, 2019), 24.

been seen as a theory of explanation. Since Aristotle, the most common view among scientific explanation models is based on "causality" and "causal laws."[108]

Philosophical approaches to the ontological status of the relationship between cause and effect and the nature of causality can be considered in three categories. In the entailment theory (determinism), there is an absolute necessity between causes and effects in nature, similar to the logical necessity between premises and conclusions. The source of causal necessity is matter's intrinsic nature. Unless accepted, it is impossible to explain the regular repetitions in nature. Understandings that accept the cause-effect relationship as necessary and determined are called determinism (necessitarianism). The approach that argues everything occurs according to causal laws, that nothing on earth can be causeless, and that an event is determined by previous events, conditions, and natural laws is called "causal determinism."[109] Determinist approaches are divided into different types depending on the fields in which they are applied and the sources of necessity. The kind of determinism dominant in empirical sciences, such as natural sciences, argues that all events are predetermined, known as empirical determinism. Accordingly, the result must necessarily occur when certain situations and conditions come together. The causes of the events that occur exist in nature. Another distinction is related to the source of necessity in nature.[110] The understanding that everything in the universe is determined by God is called metaphysical/theological determinism. In contrast, the understanding that explains all movements and changes in the universe—whether physical, chemical, biological, spiritual, or social—with matter itself and mechanical laws is called mechanical/materialist determinism.[111]

Another approach to the relationship between cause and effect is the regularity theory, which opposes strict determinist and mechanistic conceptions and treats

108 T. Grunberg ve D. Grunberg, "Bilimsel Açıklama," *Bilim Felsefesi*, bs. 1, ed. İ. Taşdelen (Eskişehir: Anadolu Üniversitesi Yayını, 2011), 52-84.

109 Süleyman Hayri Bolay, *Felsefi Doktrinler ve Terimler Sözlüğü* (Ankara: Akçağ Yayınları, 1997), 43; Ahmet Cevizci, *Felsefe Sözlüğü* (İstanbul: Paradigma Yayınları, 1999), 223, 618.

110 Ahmet Mekin Kandemir, "Mu'tezile Kelâmında Tabiî Nedensellik Düşüncesi" (Doktora Tezi, Necmettin Erbakan Üniversitesi, 2019), 16. https://acikerisim.erbakan.edu.tr/xmlui/bitstream/handle/20.500.12452/4959/Ahmet%20Mekin%20Kandemir.pdf?sequence=1&isAllowed=y (D.A. 15.05.2021)

111 Bolay, *Felsefi Doktrinler*, 308-309; Orhan Hançerlioğlu, *Felsefe Sözlüğü* (İstanbul: Remzi Kitabevi, 1973), 137.

causality as an epistemological category. According to Hume, only spatial continuity and temporal priority can be detected between two events believed to be connected by cause and effect.

The causality perceived in nature consists of regular repeated events subject to experiment and observation. There is no reason to say that the cause necessarily entails the effect in every case. Because it is only observed that the cause precedes the effect. This approach, which denies the necessity between cause and effect, is known as indeterminism. According to this idea, nothing in the universe is determined. Some events do not have a cause, nor can they be explained by laws or principles. Causes are not determinative of results.

The *activity theory* also accepts the principle of causality, and is another approach to causality. Still, according to this theory, the cause must be active (*fā'il*) in order to produce an effect. Therefore, the only cause that is effective in the result can be beings with will. The chain of causality cannot go on indefinitely; it must end at a first cause without a cause. According to many thinkers, the first cause is God. A deterministic structure is envisaged in nature, but this is not mechanical determinism but purposive determinism. Although God is the first cause and the first mover, the functioning of the world is explained by a chain of causality that operates entirely by itself.

Jābir explains causality in terms of potentiality (*bi'l-quwwa*) and actuality (*bi'l-fi'l*). Potential is what is possible in the future, such as a sitting person standing and sitting down or the like. On the other hand, the actual thing is that which exists in the present from various present actions, such as the sitting of the seated and the standing of the standing. A potential thing is something from which it is possible for an actual thing to occur that is present in the apparent. Such as: fire is potentially air, air is potentially water, water is potentially earth, and fire is potentially earth. After discussing these in his *Kitāb Ikhrāj mā fi'l-Quwwa ila'l-Fi'l*, Jābir continues as follows:

> ...as we have given the example [of being gold] of silver which has no difference between it and gold except weight and yellow colour. Silver has the power to accept weight in the easiest way to reach the consistency of gold, and it has the power to accept yellowness in the easiest way to gain the colour of gold. If it does not have this power, this thing does not actually occur from it, it does not appear.[112]

112 Jābir ibn Ḥayyān, "Kitāb Ikhrāc mā fi'l-Quwwa ila'l-Fi'l," *Mukhtār rasā'il*, 2:9-10, 3:1-10.

According to Jābir, the reason for the occurrence of the act (*fi'l*) is that it exists in the potency (*quwwa*). "So the potency is the substance of the act. The potency is the nature of the act and nothing else. And the act is the work of the nature that is the potency."[113] Abū Rīdah (1909-1991), who wrote a work on al-Naẓẓām, evaluates these views of Jābir on causality within the theory of *kumūn-ẓuhūr*. According to Abū Rīdah, Jābir was the first to touch upon the theory of *kumūn*, and by the expression "existing in the state of potency" he meant *kumūn*.[114]

Jābir and the alchemists he represents share the views of the group called *aṣḥāb al-ṭabā'i'* by the theologians because they regard nature as an instrument of natural causality. However, Jābir and Balīnās, one of his primary sources, in his *Sirr al-Khalīqa*, perceive themselves as not belonging to this group. In the work mentioned above, Balīnās strongly condemns the *aṣḥāb al-ṭabā'i'*, whom he characterizes as a group that glorifies and worships nature. Jābir also states in *Kitāb al-Sab'īn* that the naturalists are outside the field of alchemy.[115]

The idea of causality that we encounter in Jābir manifests itself in the form of empirical causality since he is an alchemist. Empirical causality states that every event, process, or occurrence is determined by the conditions that produce it, and that the result cannot occur without these conditions. It has been stated that empirical causality does not allow for freedom.[116] In his *Kitāb Ikhrāj mā fi'l-Quwwa ila'l-Fi'l*, Jābir defines quality as the process (*tadbīr*) of art (alchemy) and draws attention to the empirical process with the statement "There would be no art without quality, and it (quality) is the tadbīr".[117] He categorizes quality as that which is for corpses (*ajsād*), that which is for spirits (*arwāḥ*), that which is for mixture (*imtizāj*), and that which is for projection (*ṭarḥ*). He says that these four processes are true art.[118]

The empirical causality in Jābir is based on the phenomenon of mīzān, which he calls *'ilm al-mīzān*. Another issue to be noted about Jābir's idea of causality, which states that transformation is possible through practices based on the knowledge of

113 Jābir ibn Ḥayyān, "Kitāb Ikhrāc mā fi'l-Quwwa ila'l-Fi'l," *Mukhtār rasā'il*, 4.

114 Osman Demir, *Kelâmda Nedensellik*, 2nd ed. (İstanbul: Klasik, 2021), 180.; Ahmet Mekin Kandemir, *Mu'tezili Düşüncede Tabiat ve Nedensellik* (İstanbul: Endülüs Yayınları, 2019), 132, 233.

115 Syed Nomanul Haq, "Tabia," *EI²*, X, Leiden (1998): 24-27.

116 Demir, *Kelâmda Nedensellik*, 24.

117 Jābir ibn Ḥayyān, "Kitāb Ikhrāc mā fi'l-Quwwa ila'l-Fi'l," *Mukhtār rasā'il*, 66:5.

118 Jābir ibn Ḥayyān, "Kitāb Ikhrāc mā fi'l-Quwwa ila'l-Fi'l," *Mukhtār rasā'il*, 66:6-7.

mīzan, is that Jābirian causality is different from Peripatetic (*Mash'shai*) causality. According to Ibn Sina, the source of sensible (*maḥsūs*) qualities are non-sensible (*ghayr maḥsūs*) forms, and the properties we perceive by observing are accidents that arise as a necessity of this non-sensible or intelligible form.[119] On the contrary, Jābir argues that the properties we see in physical objects are not underlain by rational principles, as the Peripatetic philosophers claim, but rather by physical principles. He devotes his chemical theory to explaining the physical functioning of these physical principles. According to Jābir, who does not accept the rational forms (*fuṣūl*) in Ibn Sina, a cold and wet object does not have a separate metaphysical form that makes it cold and wet; natures are the real material elements of objects, and objects can be decomposed into these natures, which are their building blocks. Through the increase, decrease, and reorganization of natures, objects can be transformed, and natures, like all material entities, have weight and other physical properties. According to Aristotle, when the fire is deprived of heat, the opposite quality, cold, always appears; thus, fire, which is hot and dry, is transformed into the earth, which is cold and dry. In the Jābirian system, however, we can remove heat from fire through the processes of alchemy and thereby reduce fire to pure dryness. Because, of course, there are objects that are only hot or only cold.[120] Within the framework of all that has been said, we can characterize the Peripatetic theory of causality as naturalist teleology and Jābir's as a *qualitative mechanism*. In the Peripatetic theory of causality, rational principles cause sensible properties, whereas, in the Jābirian theory of causality, physical principles give rise to physical properties.

Conclusion

The foundation of alchemy and the theory of matter in the classical period of Islamic thought is found in the works of Jābir b. Ḥayyān. Jābir, one of the most important representatives of alchemy, based his explanations of the formation and structure of the universe mainly on Aristotle's theory of the four elements and Galen's theory of the humours. It is possible to say that Jābir developed an elemental theory similar to Aristotle's system. Still, by transferring the basis of the theory from material elements to qualities, he conflated matter and substance.

119 Üçer, *Mıknatıs Neden Çeker?*, 52-53.

120 Haq, *Tabia, EI²*, 24-27.

In both the *Sirr* and the corpus of Jābir, the formation of bodies from natures (hot, cold, dry, wet) is explained in mechanical terms. According to Jābir, substance sticks to natures, and the four basic bodies are formed. The Jābirian natures are implanted in substance, "attack" it, and "act upon" it; they "shape," "embrace," and "compress" it. All these ideas are in sharp contrast with Aristotle. While there are some isolated similarities between Aristotle's four qualities and Jābir's natures, the two groups of entities are both metaphysically and functionally distinct. Aristotelian qualities are conceptual entities, whereas Jābirian natures are real elements. Qualities cannot be isolated, but natures are independent entities capable of physical actions such as movement, union, and separation. The author of Jābir's corpus sometimes explicitly distinguishes between qualities and natures.[121] Jābir attributed independence and corporeality to the qualities he called "principles" (*uṣūl*, sing. *aṣl*), "bases" (*arkān*, sing. *rukn*), "first simples", "first elements", and most commonly "natures" (*ṭabā'i'*, sing. *ṭab'*), recognizing them as real elements. Thus, the four primordial Aristotelian qualities (hot, cold, moist, and dry) were included in Jābir's system as real, material, and independent corporeal entities, not abstractions or additions to matter.

In Jābir's system, the emergence of the first qualitative natures and elements into existence is possible with substance. Substance is capable of receiving everything [i.e. all categories of being]. It is in everything; everything is born from it, and everything will return to it. Although it is not corporeal in itself, it is – in the case of the natural world – visible. According to Jābir, no one can perceive substance with the sense of touch. Even if someone comes into contact with it, they will not find it perceptible in terms of touch. In other words, no one can hold the substance with their hands. In the universe, the substance first appears as intangible in the illuminating and greatest universe that surrounds the realm we live in, and then turns into matter by taking a certain form and color. All objects of the natural world ultimately arise from the attachment of qualities to substance. In the first stage, substance is the carrier of the four qualities and ensures their embodiment. In the second stage, the material substance merges with the soul (spiritual substance, nafs). The *nafs* (spiritual substance) also gives the substance (material substance) a geometrical form, a shape that is necessarily spherical. The substance, binding itself to one of the four discrete qualities, thus becomes a corporeal body. In Jābir's system, the attribution of natures to material substances makes transformation possible.

121 Haq, *Tabia, EI²*, 24-27.

The implantation of the natures in the substance is either divine creation (First *Mīzān*), which occurs at once (*daf'atan wāḥidatan*), at one time and in quantitative equilibrium, or secondary creation, art, alchemy, imitation of divine art (Second *Mīzān*), which occurs in successive steps (*daf'āt*), bit by bit, over a period of time, not in equilibrium. By discovering how the divine forms of creation are, the alchemist, too, can imitate creation - the attachment of natures to material substances – and make transmutation possible. God created the world because he created primary natures. Man, on the other hand, can "create" the material elements, which are secondary. Thus, it is not nature, but the elements that the alchemist creates; alchemy and the transformation of matter is not a creation out of nothing but at best, an imitation. Alchemy, which he also defines as "the art of incorporating spirits into bodies", aims to actualize the potion that is potential in Jābir's system. When substances that volatilize when placed in fire, such as mercury, *zirnīkh* (arsenic sulfide), sulfur, sal ammoniac (ammonium chloride), camphor, and the oil found in everything – spirits (*arwāḥ*) – are combined with their *ajsām* (bodies), *ajsād* (bodies) are formed. In other words, everything whose spirit unites with its *jism* (body) in balance becomes a *jasad* (body). Thus, the potion, which is potential, becomes actualized. The transmutation of the alchemist is to reveal what is hidden, to make what is hidden manifest. Jābir's most influential doctrines, the *mercury-sulfur* and *mīzān* theories, explain how alchemy makes these transformations possible. The metal we call iron is only manifestly iron; the precious metal hidden within it is gold. The alchemist, who reveals the internal structure of precious metals with the science of mīzān, realizes the transformation of base metals into precious metals by endowing base metals with the qualitative structure of precious metals. With his theory of mīzān, Jābir presented a model of explanation based on the quantitative calculation of sensible qualities and contributed to the history of alchemy in this context by putting this model, which has a few known representatives, into an order.

In all these processes in Jābir's system, except for the first creation (first *mīzān*), empirical causality is also noteworthy when one examines the theories of alchemy which explain events in terms of nature's own internal processes and of a cause-and-effect relationship that operates entirely on its own and independently. In empirical causality, every event, process, or occurrence is determined by the conditions that produce it, and the result does not occur until these conditions are met. According to Jābir, what is present in the potency occurs in the act, that is, the potency is the substance of the act. The act, on the other hand, is the work of nature, which is the po-

tency. For example, silver has the capacity to accept weight in the easiest way to reach the consistency of gold, and it has the capacity to accept yellowness in the easiest way to gain the colour of gold. These properties, which are present in it as a potentiality, emerge as an act. In comparison with Peripatetic causality, we can characterize the Peripatetic theory of causality as naturalist teleology and Jābir's as a qualitative mechanism and state that physical principles give rise to physical properties.

When we analyze the theories of "four qualities-four elements", "mercury-sulfur", "science of *mīzān*" (science of balance), and "transmutation" in the Islamic alchemical tradition, we see that according to Jābir, everything in the visible and invisible world is the result of a certain order. Within this order, everything visible and invisible in nature is the result of the determinable combination of the four elements (fire, air, water, and earth) of four qualities (heat, coldness, moistness, dryness). The science of Art (alchemy) aims to determine the proportions of the qualities that make up things, and if this is achieved, the *mīzān* (balance) of a thing can be restored and transmutation can be achieved.

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