

## CHAPTER I

# THE NATURE OF MATTER

AN article, bearing the title *Occult Chemistry*, appeared in *Lucifer*, November 1895, and was reprinted as a separate pamphlet in 1905. In that article three chemical elements, Hydrogen, Oxygen and Nitrogen, were clairvoyantly examined, and their analyses were presented tentatively to the public. The work was done by Mr. Leadbeater and myself. The pressing nature of our other labours prevented further investigation at the time, but we have, however, lately (1907) had the opportunity of pursuing these researches further, and as a considerable amount of work has been done, it seems worth while, still tentatively, to report the observations made. Certain principles seem to emerge from the mass of details, and it is possible that readers, who are better versed in chemistry than ourselves, may see suggestions to which we are blind. An observer's duty is to state clearly his observations; it is for others to judge of their value, and to decide whether they indicate lines of research that may be profitably followed up by scientists.

The drawings of the elements (in the first edition) were done by two Theosophical artists, Herr Hecker and Mrs. M. L. Kirby, whom we sincerely thank; the diagrams, showing the details of the construction of each element, we owe to the most painstaking labour of Mr. Jinarājadāsa, without whose aid it would have been impossible for us to have presented clearly and definitely the complicated arrangements by which the chemical elements are built up. We have also to thank him for a number of most useful notes, implying much careful research, which are incorporated in the present series, and without which we could not have written these papers. Lastly, we have to thank Sir William Crookes for kindly lending his diagram of the grouping of the elements, showing them as arranged on successive "figures of eight," a grouping which, as will be seen, receives much support from clairvoyant observations.

As we study these complex arrangements, we realize the truth of the old Platonic idea that the LOGOS geometrizes; and we recall H. P. Blavatsky's statement that nature ever builds by form and number.

The physical world is regarded (1895) as being composed of between sixty and seventy chemical elements, aggregated into an infinite variety of combinations. These combinations fall under the three main heads of solids, liquids and gases, the recognized substates of physical matter, with the theoretical ether (Aether of space) scarcely admitted as material. It would not be allowed (by scientists) that gold could be raised to the etheric condition as it might be to the liquid and gaseous. The clairvoyant

finds that the gaseous is succeeded by the etheric state, as the solid is succeeded by the liquid. The etheric state is found to cover four substates, as distinct from each other as are solids, liquids and gases. All chemical elements have their four etheric substates, which, with the solid, liquid, and gaseous, give us seven substates of matter in the physical world.

The method by which these four etheric substates were studied consisted in taking what is called by chemists an atom of an element and breaking it up, time after time, until what proved to be the ultimate physical unit was reached.

### HYDROGEN

The first chemical atom selected for examination was an atom of Hydrogen (H). On looking carefully at it, it was seen to consist of six small bodies, contained in an egg-like form, Fig. 1. It rotated with great rapidity on its own axis, vibrating at the same time, the internal bodies performing similar gyrations. The whole atom spins and quivers and has to be steadied before exact observation is possible. The six little bodies are arranged in two sets of three, forming two triangles that are not interchangeable. The lines in the diagram of the atom on the gaseous sub-plane, Fig 1, are not lines of force, but show the two triangles; on a plane surface the interpenetration of the triangles cannot be clearly indicated. The six bodies are not all alike; they each contain three smaller bodies—each of these being an ultimate physical atom or Anu. In two of them the three Anu are arranged in a line, while in the remaining four they are arranged in a triangle.

The first thing that happens on removing a gaseous atom from its 'hole' or encircling 'wall,' is that the contained bodies are set free, and, evidently released from tremendous pressure, assume spherical or ovoid forms, the Anu within each re-arranging themselves, more or less, within the new 'hole' or 'wall'. The figures are, of course, three-dimensional, and often remind one of crystals; tetrahedra, octahedra, and other like forms being of constant occurrence.

It is, of course, impossible to convey in words the clear conceptions that are gained by direct vision of the objects of study, and Fig. 2 is offered as a substitute, however poor, for the lacking vision of the readers. The horizontal lines separate from each other the seven substates of matter; solid, liquid, gas, ether 4, ether 3, ether 2, ether 1. The successive changes undergone by the Hydrogen atom are shown in the compartments vertically above it. It must be remembered that the bodies shown diagrammatically in no way indicate relative size; as a body is raised from one substate to the one immediately above it, it is enormously magnified for the purpose of investigation.

When the gaseous atom of Hydrogen is raised to the E4 level the wall of the limiting spheroid in which the bodies are enclosed, being composed of the matter of the gaseous kind, drops away and the six bodies are set free. They at once re-arrange themselves in two triangles, each enclosed by a limiting sphere; one sphere having a positive character, the other being negative. These form the Hydrogen particles of the lowest etheric plane, marked E4 (ether 4) in Fig. 2.

# HYDROGEN

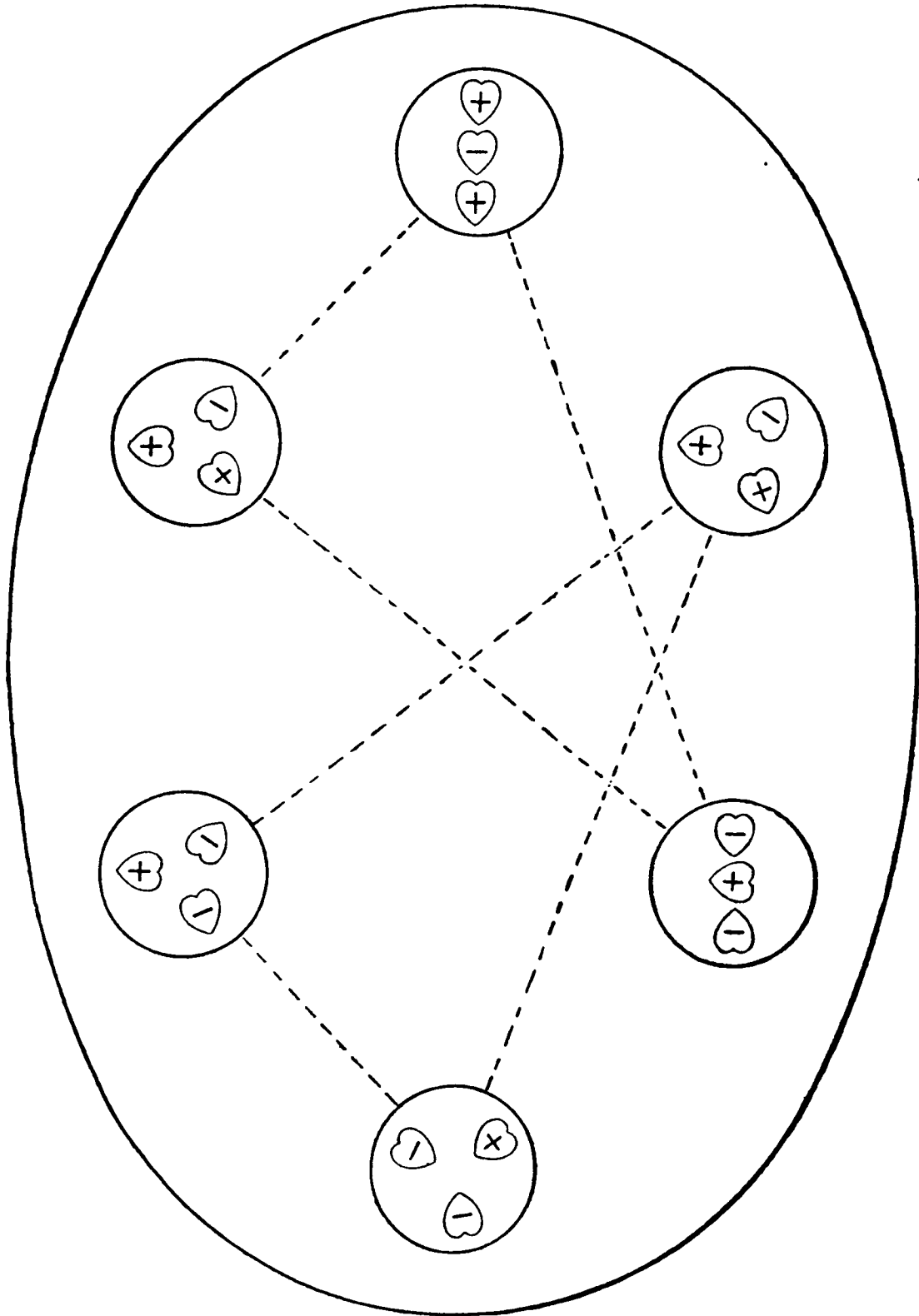


FIG. 1. HYDROGEN

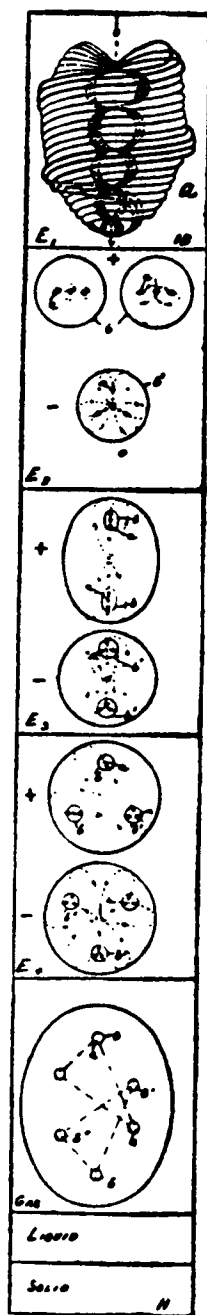


FIG. 2.  
DISINTEGRA-  
TION OF  
HYDROGEN

On raising to E3, they undergo another disintegration, losing their limiting walls. The positive sphere becomes two bodies, one consisting of the two groups distinguishable by the linear arrangement of the contained Anu, enclosed in a wall, and the other being the third body enclosed on the E4 level and now set free. The negative sphere also becomes two bodies, one consisting of the two groups of three Anu, and the second, the remaining body, being set free. These free bodies do not remain on the E3 level but pass immediately to E2 leaving the positive and negative groups, each containing two groups of three Anu, as the representatives of Hydrogen on E3. On taking these bodies a step higher to E2 in their turn, their wall disappears, and the internal triads are set free, those containing the Anu arranged lineally being positive, and those with the triangular arrangement being negative.

On again raising these bodies a step further, the falling away of the walls sets the contained Anu free and we reach the ultimate physical atom, the matter of E1, the Anu. The disintegration of this sets free particles of astral matter, so that we have thus reached the limit of physical matter.

The building up of a gaseous atom of Hydrogen may also be traced *downwards* from the E1 level. Every combination begins by a welling up of force at a centre, which is to form the centre of the combination. In the first positive Hydrogen combination on the E2 level, an Anu revolving at right angles to the plane of the paper and also revolving on its own axis, forms the centre, and force, rushing out at its lower point, rushes in at the depressions of two other Anu, which then set themselves with their points to the centre. As this triad whirls round, it clears itself a space, pressing back the undifferentiated matter of the plane, and making to itself a whirling wall of this matter, thus taking the first step towards building up the chemical Hydrogen atom. A negative triad is similarly formed, the three Anu being symmetrically arranged round the centre of out-welling force.

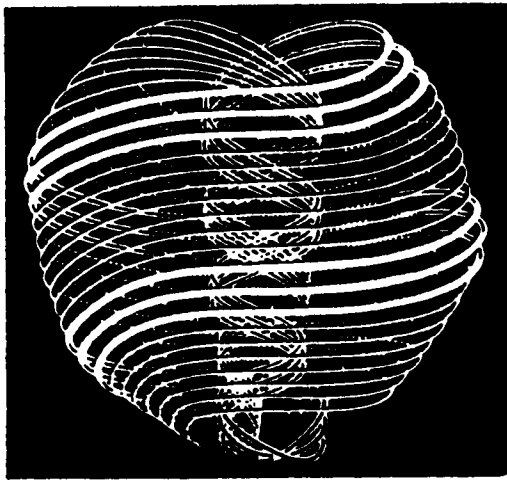
These triads then combine, two of the linear arrangement being attracted to each other and two of the triangular, force again welling up and forming a centre and acting on the triads as on a single Anu, and a limiting wall being again formed as the combination revolves round its centre.

The next stage, the E4 level, is produced by each of these combinations attracting to itself a third triad of the triangular type by the setting up of a new centre of up-welling force. Two of these uniting, and their triangles interpenetrating, the chemical atom is formed and we find it to contain all eighteen Anu.

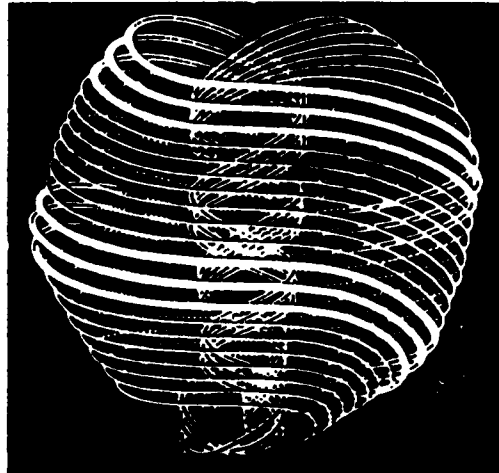
Further details and diagrams concerning Hydrogen, based on later researches, are given in Chapter 2.

## THE ULTIMATE PHYSICAL ATOM OR ANU

As we have seen, a chemical atom may be dissociated into less complicated bodies; these, again, into still less complicated; these, again, into yet still less complicated. After the third dissociation but one more is possible; the fourth dissociation gives the ultimate physical atom on the atomic sub-plane, the Anu. This may vanish from the plane, but it can undergo no further dissociation on it. In this ultimate state of physical matter two types of units, or Anu, have been observed; they are alike in everything save the direction of their whorls and of the force which pours through them. In the one case force pours in from the "outside," from fourth-dimensional space, the Astral plane, and passing through the Anu, pours into the physical world. In the second, it pours in from the physical world, and out through the Anu into the "outside" again, i.e., vanishes from the physical world. The one is like a spring, from which water bubbles out; the other is like a hole, into which water disappears. We call the Anu from which force comes out *positive* or *male*; those through which it disappears, *negative* or *female*. All Anu, so far as observed, are of one or other of these two forms. Fig. 3.



POSITIVE



NEGATIVE

FIG. 3. THE ANU

It will be seen that the Anu is a sphere, slightly flattened, and there is a depression at the point where the force flows in, causing a heart-like form. Each is surrounded by a field.

The Anu can scarcely be said to be a "thing," though it is the material out of which all things physical are composed. It is formed by the flow of the life-force and vanishes with its ebb. The life-force is known to Theosophists as Fohat, the force of which all the physical plane forces are differentiations. When this force arises in "space," that is when Fohat "digs holes in space,"—the apparent void which must be filled with substance of some kind, of inconceivable tenuity—Anu appear; if this be artificially stopped for a single Anu, the Anu disappears; there is nothing left. Presumably, were

that flow checked but for an instant, the whole physical world would vanish as a cloud melts away in the empyrean. It is only the persistence of that flow (the first life-wave, the work of the third Logos) which maintains the physical basis of the universe.

In order to examine the construction of the Anu, a space is artificially made. (By a certain action of the will, known to students, it is possible to make such a space by pressing back and walling off the matter of space.) Then, if an opening be made in the wall thus constructed, the surrounding force flows in, and three whorls immediately appear surrounding the "hole" with their triple spiral of two and a half coils, and returning to their origin by a spiral within the Anu; these are at once followed by seven finer whorls, which, following the spiral of the first three on the outer surface, and returning to their origin by a spiral within that, flowing in the opposite direction—form a caduceus with the first three. Each of the three coarser whorls, flattened out, makes a closed circle; each of the seven finer ones, similarly flattened out, makes a closed circle. The forces which flow in them again come from "outside," from a fourth-dimensional space. Each of the finer whorls is formed of seven yet finer ones, set successively at right angles to each other, each finer than its predecessor; these we call spirillae. (Each spirilla is animated by the life-force of a plane, and four are at present normally active, one for each Round. Their activity in an individual may be prematurely forced by yoga practice.)

In the three whorls flow currents of different electricities; the seven whorls vibrate in response to etheric waves of all kinds—to sound, light, heat, etc.; they show the seven colours of the spectrum; give out the seven sounds of the natural scale; respond in a variety of ways to physical vibration—flashing, singing, pulsing bodies, they move incessantly, inconceivably beautiful and brilliant.

The Anu is a sun in miniature in its own universe of the inconceivably minute. Each of the seven whorls is connected with one of the Planetary Logoi, so that each Planetary Logos has a direct influence playing on the very matter of which all things are constructed. It may be supposed that the three conveying electricity, a differentiation of Fohat, are related to the Solar Logos.

Force pours into the heart-shaped depression at the top of the Anu, and issues from the point, and is changed in character by its passage; further, force rushes through every spiral and every spirilla, and the changing shades of colour that flash out from the rapidly revolving and vibrating Anu depend on the several activities of the spirals; sometimes one, sometimes another, is thrown into more energetic action, and with the change of activity from one spiral to another the colour changes.

The Anu has—as observed so far—three proper motions, *i.e.*, motions of its own, independent of any imposed upon it from outside. It turns incessantly upon its own axis, spinning like a top; it describes a small circle with its axis, as though the axis of the spinning top moved in a small circle; it has a regular pulsation, a contraction and expansion, like the pulsation of the heart. When a force is brought to bear upon it, it dances up and down, flings itself wildly from side to side, performs the most astonishing and rapid gyrations, but the three fundamental motions incessantly persist. If it be made to vibrate, as a whole, at the rate which gives any one of the seven colours, the whorl belonging to that colour glows out brilliantly.

An electric current brought to bear upon the Anu checks their proper motions, *i.e.*, renders them slower; the Anu exposed to it arrange themselves in parallel lines, and in each line the heart-shaped depression receives the flow, which passes out through the apex into the depression of the next, and so on. The Anu always set themselves to the current. Fig. 4. In all the diagrams the heart-shaped body, exaggerated to show the depression caused by the inflow and the point caused by the outflow, is a single Anu.

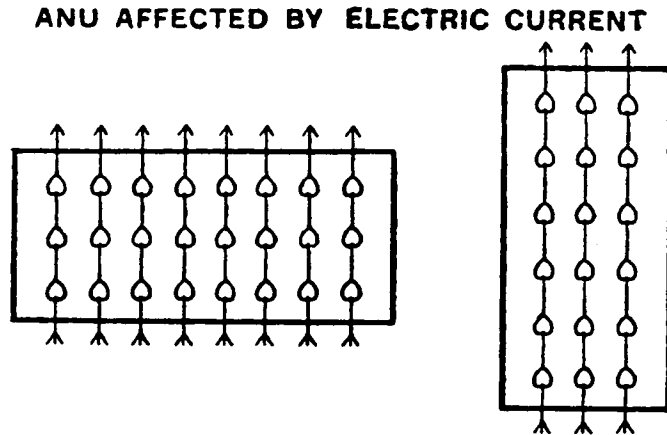


FIG. 4

The action of electricity opens up ground of large extent, and cannot be dealt with here. Does it act on the Anu themselves, or on molecules, or sometimes on one and sometimes on the other? In soft iron, for instance, are the internal arrangements of the chemical atom forcibly distorted, and do they elastically return to their original relations when released? In steel is the distortion permanent?

It will be understood from the foregoing, that the Anu cannot be said to have a wall of its own, unless these whorls of force can be so designated; its "wall" is the pressed back "space." As said in 1895, of the chemical atom, the force "clears itself a space, pressing back the undifferentiated matter of the plane, and making to itself a whirling wall of this matter." The wall belongs to space, not to the atom.

NOTE BY C. JINARĀJADĀSA

*The sphere-wall of the Anu.* Each Anu, as each group of Anu, whether few in number or making a large configuration as in Radium, has round it what has been termed a "sphere-wall". This enclosing sphere is at a great distance from the central group and is generally a sphere; there are a few exceptions as in Nitrogen, an ovoid. When writing out for publication the structure of the Anu, Annie Besant stated that the sphere-wall of the Anu was composed of the "undifferentiated matter of the plane". From the beginning this has created difficulties for me, since the term used by her to describe the sphere-wall could only be composed of Anu. It was only later that a special investigation was made to examine the nature of the sphere-wall of the Anu. Though there were no final conclusions on the matter, it appeared to the investigator as if the sphere-wall was composed of

forces radiating from the centre, which after travelling a certain distance, returned to the centre. The nature of this radiating force was not analyzed. Therefore, though the sphere-wall appears as a part of the Anu, it is only a temporary phenomenon. It was later discovered that the sphere-walls of Anu within the solar system were all compressed by the attraction of the sun. When so compressed the sphere-wall did not, as expected, have the shape of the dodecahedron, but that of the rhombic dodecahedron.

### KOILON—THE AETHER OF SPACE

The following account was written by C. W. Leadbeater in 1907. It is reproduced here as giving further essential details concerning the relation between the planes of nature and the structure of the Anu :

The scientific hypothesis is that all space is filled with a substance called aether, as to the constitution of which many apparently contradictory statements are made. It is thought to be infinitely thinner than the thinnest gas, absolutely frictionless and without weight, and yet from another point of view far denser than the densest solid. In this substance the ultimate atoms of matter are thought to float as motes may be seen to float in the air, and light, heat and electricity are supposed to be its vibrations.

Theosophical investigators, using methods not yet at the disposal of physical science, have found that this hypothesis includes under one head two entirely different and widely separated sets of phenomena. They have been able to deal with states of matter higher than the gaseous, and have observed that it is by means of vibrations of this finer matter that light, heat and electricity manifest themselves to us. Seeing that matter in these higher states thus performs the functions attributed to the aether of science, they have (perhaps unadvisedly) called these states etheric, and have thus left themselves without a convenient name for that substance which fulfils the other part of the scientific requirements.

Let us for the moment name this substance koilon, since it fills what we are in the habit of calling empty space. What Mûlaprakriti or "mother-matter" is to the inconceivable totality of universes, koilon is to our particular universe—not to our solar system merely, but to the vast unit which includes all visible suns. Between koilon and Mûlaprakriti there must be very many stages, but we have at present no means of estimating their number or of knowing anything whatever about them.

To any power of sight which we can bring to bear upon it this koilon appears homogeneous, though it is not probable that it is so in reality. It answers to scientific demands in so far that it is out of all proportion denser than any substance known to us—

<sup>1</sup> Greek word meaning "hollow" - C. J.



quite infinitely denser—belonging to another order and type of density altogether. For the very kernel and nexus of the whole conception is that what we call matter is *not* koilon, but the *absence of koilon*. So that to comprehend the real conditions we must modify our ideas of matter and space—modify them almost to the extent of reversing our terminology. Emptiness has become solidity and solidity emptiness.

To help us to understand more clearly let us examine the ultimate atom of the physical plane. (See Figs. 3 and 6.) It is composed of ten rings or wires, which lie side by side, but never touch one another. If one of these wires be taken away from the atom, and as it were untwisted from its peculiar spiral shape and laid out on a flat surface, it will be seen that it is a complete circle—a tightly twisted endless coil. This coil is itself a spiral containing 1,680 turns; it can be unwound, and it will then make a much larger circle. There are in each wire seven sets of such coils or spirillae, each finer than the preceding coil, to which its axis lies at right angles. The process of unwinding them in succession may be continued until we have nothing but an enormous circle of the tiniest imaginable dots lying like pearls upon an invisible string. These dots are so inconceivably small that many millions of them are needed to make one ultimate physical atom. They appear to be the basis of all matter of which we at present know anything; astral, mental and buddhic atoms also are built of them, so we may regard them as fundamental units of which all material atoms on any plane yet attainable are composed.

These units are all alike, spherical and absolutely simple in construction. Though they are the basis of all matter, they are not themselves matter; they are not blocks but bubbles. They do not resemble bubbles floating in the air, which consist of a thin film of water separating the air within them from the air outside, so that the film has both an outer and an inner surface. Their analogy is rather with the bubbles that we see rising in water, bubbles which may be said to have only one surface—that of the water which is pushed back by the contained air. Just as the bubbles are not water, but are precisely the spots from which water is absent, so these units are not koilon but the absence of koilon—the only spots where it is not—specks of nothingness floating in it, so to speak, for the interior of these space-bubbles is an absolute void to the highest power of vision that we can turn upon them.

What then is their real content—the tremendous force that can blow bubbles in a material of infinite density? What but the creative power of the Logos, the Breath which He breathes into the waters of space when He wills that manifestation shall commence? These infinitesimal bubbles are the “holes” which “Fohat digs in space”; the Logos Himself fills them, and holds them in existence against the pressure of the koilon because He Himself is in them. These units of force are the bricks which He uses in the building of His universe, and everything that we call matter, on however high or low a plane it may be, is composed of these and so is divine in its very essence.

The Outbreathing which makes these bubbles is quite distinct from and long antecedent to the Three Outpourings which have been so frequently discussed in Theosophical literature; it is not even certain whether it is the work of the Solar Logos or of One a stage higher still. The later Outpourings whirl the bubbles into the various arrangements which we call the atoms of the several planes, and then aggregate those atoms into the molecules of the chemical elements.

Thus the worlds are gradually built up, but always out of this selfsame material which to us seems nothingness, and yet is divine power. It is indeed a veritable creation, a building of something out of nothing—of what we call matter out of a privation of matter.

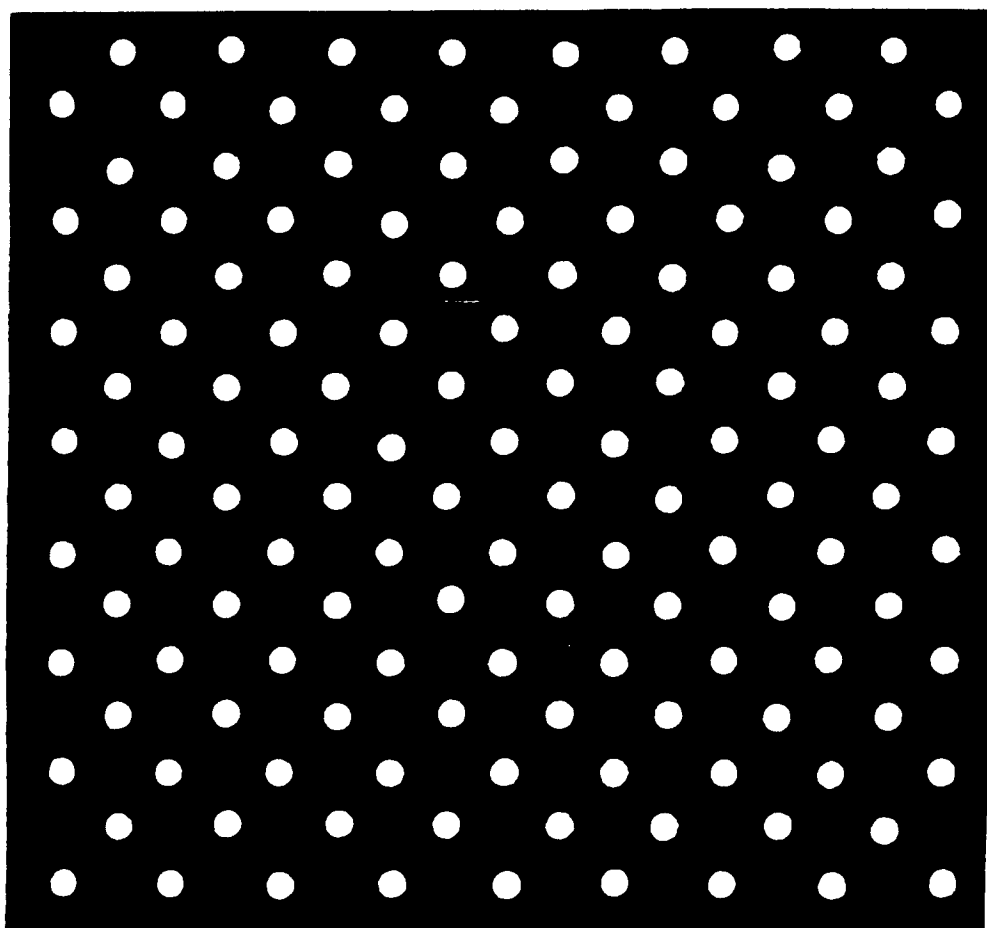


FIG. 5. BUBBLES IN KOILON

The exact number of these bubbles included in an ultimate physical atom is not readily ascertainable, but several different lines of calculation agree in indicating it as closely approximating to the almost incredible total of fourteen thousand millions. Where figures are so huge direct counting is obviously impossible, but fortunately the different parts of the atom are sufficiently alike to enable us to make an estimate whose margin of error is not likely to be very great. The atom consists of ten wires, which divide themselves naturally into two groups—the three which are thicker and more prominent, and the seven thinner ones which correspond to the colours and planets. These latter appear to be identical in constitution, though the forces flowing through them must differ, since each responds most readily to its own special set of vibrations. By actual counting it has been discovered that the numbers of coils or spirillæ of the first order in each wire is 1,680; and the proportion of the different order of spirillæ to one another is equal in all cases that have been examined, and corresponds with the number of bubbles in the ultimate spirilla of the lowest order. The ordinary sevenfold rule works quite accurately with the thinner coils, but there is a very curious variation with regard to the set of three. As may be seen from the drawings, these are obviously thicker and more prominent, and this increase of size is produced by an augmentation (so slight as to be barely perceptible) in the proportion to one another of the different orders of spirillæ and in the number of bubbles in the lowest. This augmentation, amounting at present to not more than .00571428 of the whole in each case, suggests the unexpected possibility that this portion of the atom may be somehow actually undergoing a change—may in fact be in process of growth, as there is reason to suppose that these three thicker spirals originally resembled the others.

Since observation shows us that each physical atom is represented by forty-nine astral atoms, each astral atom by forty-nine mental atoms and each mental atom by forty-nine of those on the buddhic plane, we have here evidently several terms of a regular progressive series, and the natural presumption is that the series continues where we are no longer able to observe it. Further probability is lent to this assumption by the remarkable fact that—if we assume one bubble to be what corresponds to an atom on the seventh or highest of our planes and then suppose the law of multiplication to begin its operation, so that 49 bubbles shall form the atom of the next or sixth plane, 2,401 that of the fifth, and so on—we find that the number indicated for the physical atom ( $49^6$ ) corresponds almost exactly with the calculation based upon the actual counting of the coils. Indeed, it seems probable that but for the slight growth of the three thicker wires of the atom the correspondence would have been perfect.

It must be noted that an ultimate physical atom cannot be directly broken up into astral atoms. If the unit of force which whirls those millions of bubbles into the complicated shape of a physical atom be pressed back by an effort of will over the threshold of the astral plane, the atom disappears instantly, for the bubbles are released. But the same unit of force, working now upon a higher level, expresses itself not through one astral atom, but through a group of 49. If the process of pressing back the unit of force is repeated, so that it energizes upon the mental plane, we find the group there enlarged to the number of 2,401 of those higher atoms. Upon the buddhic plane the number of atoms formed by the same amount of force is very much greater still—probably the cube of 49 instead of

the square, though they have not been actually counted. It is also probable, though not certainly known, that the number of bubbles utilized by that unit of force is the same on all these planes, though grouped on the physical as one atom, on the astral as 49 atoms, on the mental as 2,401. Therefore one physical atom is not *composed of* forty-nine astral or 2,401 mental atoms, but *corresponds* to them in the sense that the force which manifests through it would show itself on those higher planes by energizing respectively those numbers of atoms.

The koilon in which all these bubbles are formed undoubtedly represents a part, and perhaps the principal part, of what science describes as the luminiferous æther. Whether it is actually the bearer of the vibrations of light and heat through interplanetary space is as yet undetermined. It is certain that these vibrations impinge upon and are perceptible to our bodily senses only through the etheric matter of the physical plane. But this by no means proves that they are conveyed through space in the same manner, for we know very little of the extent to which the physical etheric matter exists in interplanetary and interstellar space, though the examination of meteoric matter and cosmic dust shows that at least some of it is scattered there.

The scientific theory is that the æther has some quality which enables it to transmit at a certain definite velocity transverse waves of all lengths and intensities—that velocity being what is commonly called the speed of light. Quite probably this may be true of koilon, and if so it must also be capable of communicating those waves to bubbles or aggregations of bubbles, and before the light can reach our eyes there must be a downward transference from plane to plane similar to that which takes place when a thought awakens emotion or causes action.

In a recent pamphlet on *The Density of Aether* Sir Oliver Lodge remarks "Just as the ratio of mass to volume is small in the case of a solar system or a nebula or a cobweb, I have been driven to think that the observed mechanical density of matter is probably an excessively small fraction of the total density of the substance, or æther, contained in the space which it thus partially occupies—the substance, of which it may hypothetically be held to be composed.

"Thus for instance, consider a mass of platinum, and assume that its atoms are composed of electrons, or of some structures not wholly dissimilar: the space which these bodies actually fill, as compared with the whole space which in a sense they 'occupy,' is comparable to one ten-millionth of the whole, even inside each atom; and the fraction is still smaller if it refers to the visible mass. So that a kind of minimum estimate of ætherial density, on this basis, would be something like ten thousand million times that of platinum." And further on he adds that this density may well turn out to be fifty thousand million times that of platinum. "The densest matter known" he says, "is trivial and gossamer-like compared with the unmodified æther in the same space."

Incredible as this seems to our ordinary ideas, it is undoubtedly an understatement rather than an exaggeration of the true proportion as observed in the case of koilon. We shall understand how this can be so if we remember that koilon seems absolutely homogeneous and solid even when examined by a power of magnification which makes physical atoms appear in size and arrangement like cottages scattered over a lonely moor, and when we further add to this the recollection that the bubbles of which these atoms

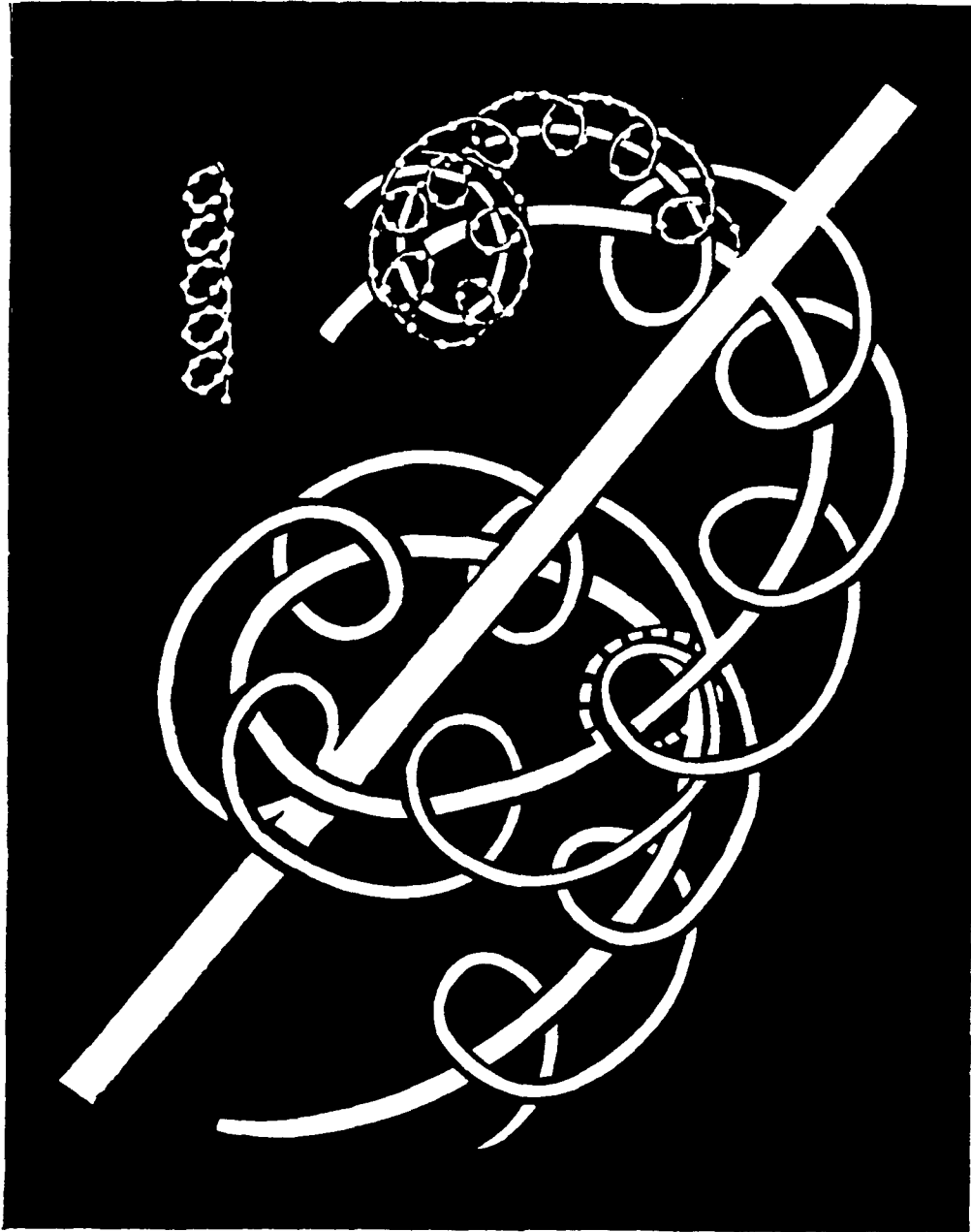


FIG. 5a. FORMATION OF BUBBLES INTO 1ST SPIRILLA  
AND 2ND AND 3RD SPIRILLAE



in turn are composed are themselves what may be not inaptly called fragments of nothingness.

In the same pamphlet Sir Oliver Lodge makes a very striking estimate of the intrinsic energy of the aether. He says "The total output of a million-kilowatt power station for thirty million years exists permanently, and at present inaccessible, in every cubic millimetre of space." Here again he is probably underestimating rather than overestimating the stupendous truth.

It may be asked how it is possible, if all this be so, that we can be so utterly unaware of the facts—how we can pass through and move amongst so dense a solid as this koilon without seeing or feeling it in any way. The answer is that consciousness can recognize only consciousness—that since we are of the nature of the Logos we can sense only those things which are also of His nature. These bubbles are of His essence, and therefore we, who are also part of Him, can see matter which is built of them, for they represent to us vehicles or manifestations of Him. But the koilon in which they move is of some other and as yet unknown nature, and therefore it is to us non-manifestation, and so imperceptible. We pass through it just as easily and unconsciously as a gnome passes through a rock, or as the wind blows through a network of iron wire. We live in it as mites live in a cheese or microbes in a body. The world built up of fragments of nothingness is to us the visible reality, just as to a miner his mine is an objective reality even though it consists of empty galleries hollowed out of the solid rock.

As none of our investigators can raise his consciousness to the seventh plane, it will be of interest to explain how it is possible for them to see what may very probably be the atom of that plane. That this may be understood it is essential to remember that the power of magnification by means of which these experiments are conducted is quite apart from the faculty of functioning upon one or other of the planes. The latter is the result of a slow and gradual unfoldment of the self, while the former is merely a special development of one of the many powers latent in man. All the planes are round us here, just as much as at any other point in space, and if a man sharpens his sight until he can see their tiniest atoms he can make a study of them, even though he may as yet be far from the level necessary to enable him to understand and function upon the higher planes as a whole or to come into touch with the glorious Intelligences who gather those atoms into vehicles for Themselves.

A partial analogy may be found in the position of the astronomer with regard to the stellar universe, or let us say the Milky Way. He can observe its constituent parts and learn a good deal about them along various lines, but it is absolutely impossible for him to see it as a whole from outside, or form any certain conception of its true shape and to know what it really is. Suppose that the universe is, as many of the ancients thought, some inconceivably vast Being; it is utterly impossible for us, here in the midst of it, to know what that Being is or is doing, for that would mean raising ourselves to a height comparable with His; but we may make extensive and detailed examination of such particles of His body as happen to be within our reach, for that means only the patient use of powers and machinery already at our command.

Let it not be supposed that, in thus unfolding a little more of the wonders of Divine truth by pushing our investigations to the very furthest point at present possible

to us, we in any way alter or modify all that has been written in Theosophical books of the shape and constitution of the physical atom, and of the wonderful and orderly arrangements by which it is grouped into the various chemical molecules; all this remains entirely unaffected.

Nor is any change introduced as regards the Three Outpourings from the Logos, and the marvellous facility with which the matter of the various planes is by them moulded into forms for the service of the evolving life. But if we wish to have a right view of the realities underlying manifestation in this universe we must to a considerable extent reverse the ordinary conception as to what this matter essentially is. Instead of thinking of its ultimate constituents as solid specks floating in a void, we must realize that it is the apparent void itself which is solid, and that the specks are but bubbles in it. That fact once grasped, all the rest remains as before. The relative position of what we have hitherto called matter and force is still for us the same as ever; it is only that on closer examination both of these conceptions of ours prove to be in reality variants of force, the one ensouling combinations of the other, and the real matter (koilon) is seen to be something which has hitherto been outside our scheme of thought altogether.

How vividly, how unmistakably this knowledge brings home to us the great doctrine of Maya, the transitoriness and unreality of earthly things, the utterly deceptive nature of appearances! When the candidate for initiation sees (not merely believes, remember, but actually *sees*) that what has always before seemed to him empty space is in reality a solid mass of inconceivable density, and that the matter which has appeared to be the one tangible and certain basis of things is not only by comparison tenuous as gossamer (the "web" spun by "Father-Mother"), but is actually composed of emptiness and nothingness—is itself the very negation of matter—then for the first time he thoroughly appreciates the valuelessness of the physical senses as guides to the truth. Yet even more clearly still stands out the glorious certainty of the immanence of the Divine; not only is everything ensouled by the Logos, but even its visible manifestation is literally part of Him, is built of His very substance, so that matter as well as spirit becomes sacred to the student who really understands.

Perhaps the consideration of these two factors may help us to comprehend many statements in *The Secret Doctrine*, such as (to select two references at random) that "matter is nothing but an aggregation of atomic forces" (iii, 398) and that "Buddha taught that the primitive substance is eternal and unchangeable. Its vehicle is the pure luminous ether, the boundless infinite space, not a void resulting from the absence of the forms, but on the contrary the foundation of all forms." (iii, 402)

It has been suggested (though this is merely a matter of reverent speculation) that in successive universes there may be a progressive diminution in the size of the bubbles—that it may be the very glory of a Logos that He can sacrifice Himself to the uttermost by thus thoroughly permeating and making Himself one with that portion of koilon which He selects as the field of His universe.

What is the actual nature of koilon, what is its origin, whether it is itself in any way changed by the Divine Breath which is poured into it—these are questions the answers to which investigation cannot as yet give, though they may perchance be found by an intelligent study of the great scriptures of the world.



NOTE BY C. W. LEADBEATER

There is a sentence in the article on "Koilon". It runs as follows :

"By actual counting it has been discovered that the number of coils or spirillæ of the first order in each wire is 1,680; and the proportion of the different orders of spirillæ to one another is equal in all cases that have been examined, and corresponds with the number of bubbles in the ultimate spirilla of the lowest order."

I counted all those 1,680 turns in the wire of the Anu, not once, but many times. I tried altogether 135 different specimens, taken from all sorts of substances.

If we remove one wire from the Anu it can of course be straightened out into a circle. Really, however, it is not a single wire but a spiral spring, as in Fig. 6, and I called each of these little rings a coil, or a "spirilla of the first order," "a," and I meant to explain that there were 1,680 of these rings or turns or coils in each wire. But each of those coils is itself a spiral spring made up of *finer* coils (which we might call "b") and I

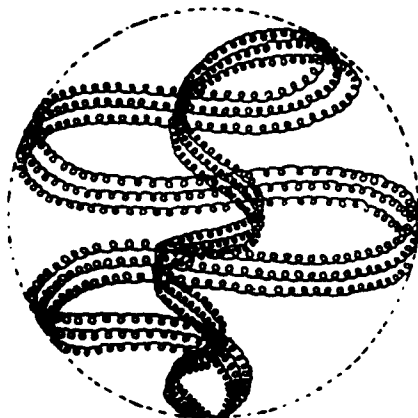


FIG. 6. THREE COILS IN AN ANU

called *those* "spirillæ of the second order," and so on down to "spirillæ of the lowest order". In the seven thinner wires of the atom which correspond to the seven colours I find that each "spirilla of the first order," "a," is composed of *seven* "spirillæ of the second order". "b", each "b" in turn is composed of seven "c"s, each "c" of seven "d"s, and so on down to the "spirilla of the lowest order" which is composed of exactly seven bubbles.

But in the three thicker wires of the atom there is a very slight difference. The seven bubbles no longer fit *exactly* under one another, as it were, if one looks along or through the wire endwise; in 100 "spirillæ of the lowest order" there *ought* to be just 700 bubbles; so there *are* in the seven thinner, coloured wires, but in the three thicker wires there are 704. So the increase is at present 1 in 175. *And* the same curious little increase holds good in the relation of the different orders of spirillæ. In the *thinner* wires exactly 7 spirillæ of one order make 1 of the next higher order, so that 700 "b"s make exactly 100 "a"s and so on; but in the *thicker* wires 704 "b"s go to 100 "a"s, and the same curious proportion all through. That is what I meant when I said that "the proportion of the different orders of spirillæ to one another

is equal, and corresponds with the number of bubbles in the ultimate spirilla of the lowest order."

### THE ETHERIC SUBPLANES

*The first etheric subplane E1* is formed, as has been previously explained, by single Anu. More or less complex combinations of these Anu form successively the second, E2, third, E3, and fourth, E4, etheric subplanes.

*The second subplane E2*—The simplest union of Anu, apparently never consisting of more than seven, form the second etheric subplane. In Fig. 7 are shown some characteristic combinations of the E2 state; the Anu is conventional, with the depression emphasized. The lines, always entering at the depression and coming out at the apex, show the resultants of lines of force. Where no line appears entering the depression, the force wells up from four-dimensional space; where no line appears leaving the apex, the force disappears into four-dimensional space; where the point of entry and departure is outside the Anu, it is indicated by a dot. It must be remembered that the diagrams represent three-dimensional objects, and that the Anu are not necessarily all on one plane.

### TYPES OF E2 MATTER

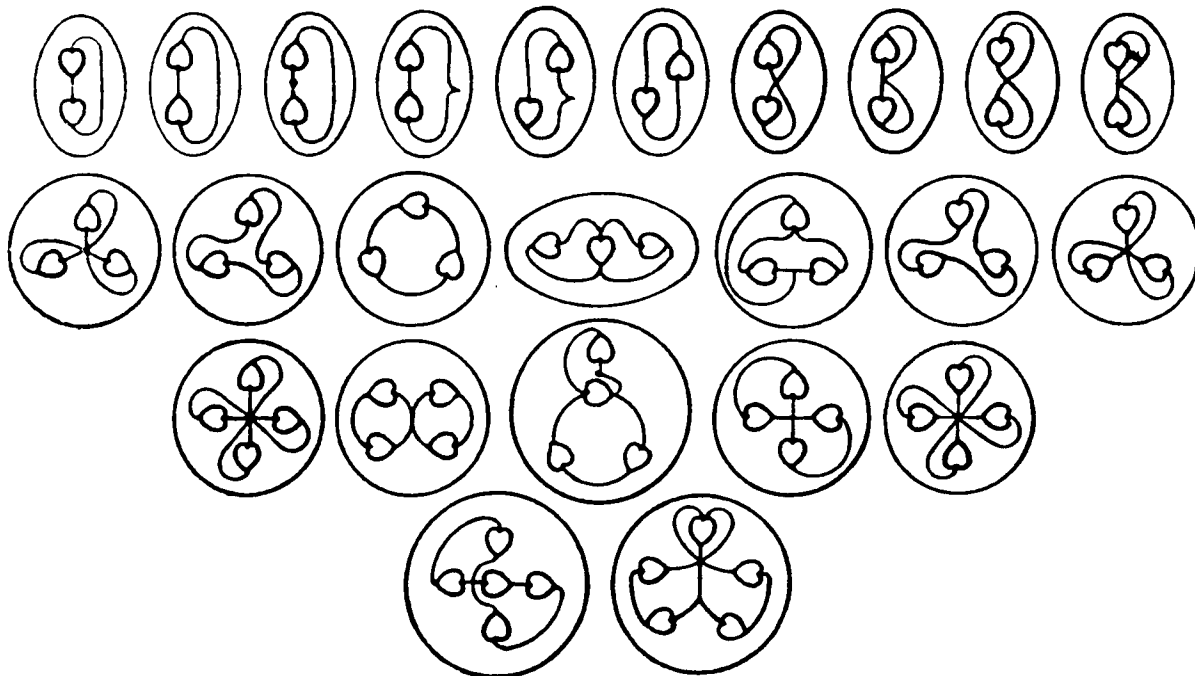


FIG. 7

*The third Etheric Subplane E3*—The E3 state, in some of its combinations, appears at first sight to repeat those of the E2 state; the only obvious way of distinguishing to which some of the groups of less complexity belong is to pull them out of the "cell-wall": if they are E2 groups they at once fly off as separate Anu; if they are E3 groups they break up into two or more groups containing a smaller number of Anu. Thus one of the E2 groups of iron, containing seven Anu, is identical in appearance with an E3 heptad, but the former dissociates into seven Anu, the latter into two triads and a single Anu. Long-continued research into the detailed play of forces and their results is necessary; we are here only able to give preliminary facts and details, are opening up the way.

**TYPES OF E3 MATTER**

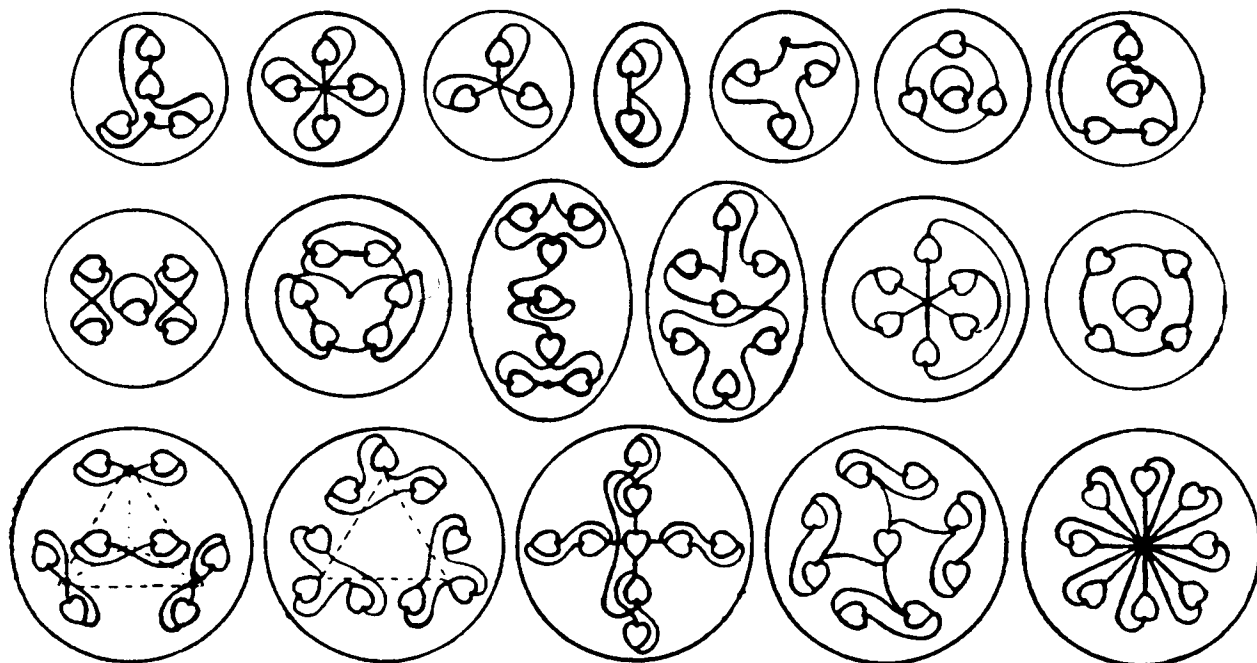


FIG. 8

*The fourth etheric subplane E4.*—The E4 state preserves many of the forms in the elements, modified by release from the pressure to which they are subjected in the chemical atom. In this state various groups are thus recognizable which are characteristic of allied elements.

These groups are taken from the products of the first disintegration of the chemical atom, by forcibly removing it from its hole. The groups fly apart, assuming a great variety of forms often more or less geometrical; the lines between the constituents of the groups, where indicated, no longer represent lines of force, but are intended to represent the impression of form, i.e., of the relative position and motion of the constituents, made on the mind of the observer. They are elusive, for there are no lines. The appearance of lines is caused by the rapid motion of the constituents up and down, or along them backwards and forwards. The dots represent Anu, within the elements. Fig. 9.



Two Anu, positive and negative, brought near to each other, attract each other, and then commence to revolve round each other, forming a relatively stable duality; such a molecule is neutral. Combinations of three or more Anu are positive, negative or neutral, according to the internal molecular arrangement; the neutral are relatively stable, the positive and negative are continually in search of their respective opposites, with a view to establishing a relatively permanent union.

Speaking generally, *positive groups are marked by the points of Anu being turned outward and negative groups by the points being turned inward* towards each other and the centre of the group.

The groups show all kinds of possible combinations; the combinations spin, turn head over heels, and gyrate in endless ways. Each aggregation is surrounded with an apparent cell-wall, a circle or oval, due to the pressure on the surrounding matter caused by its whirling motion. The surrounding fields strike on each other and the groups and rebound, dart hither and thither, for reasons we have not distinguished.

# TYPES OF E4 MATTER

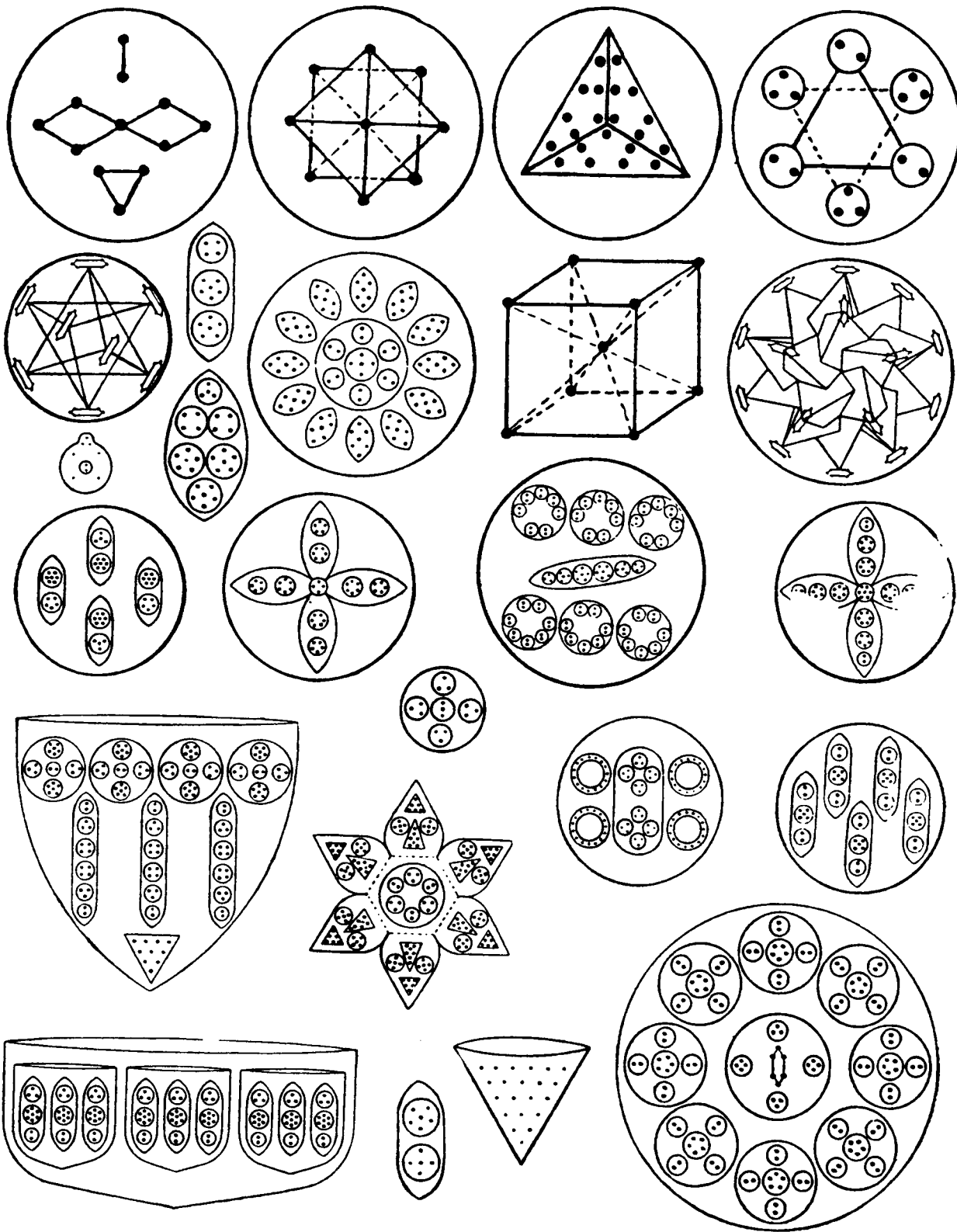


FIG. 9

OCCULT CHEMISTRY  
THE CHEMICAL ELEMENTS

The first thing which is noticed by the observer, when he turns his attention to the chemical atoms, is that they show certain definite forms. The main types are not very numerous, and we found that, when we arranged the atoms we had observed according to their external forms, with a few exceptions they fell into seven natural classes. Fig. 10.

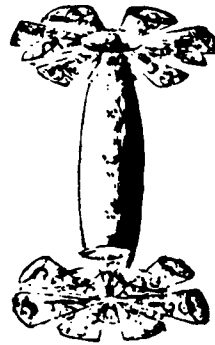
1. The Spike Group
2. The Dumb-bell Group
3. The Tetrahedron Group
4. The Cube Group
5. The Octahedron Group
6. The Crossed Bars Group
7. The Star Group

Each atom has a spherical or oval wall, within which the various groups of Anu move. That wall is drawn as an ovoid in the case of Hydrogen; it must be imagined in the case of every other element. A sphere-wall is a temporary effect, caused by one or more Anu in rotation. Just as a stream of air under pressure will make a hole on the surface of water, by pushing back that water, so is it with the groups. As they revolve, the force of their motion drives back the circumambient medium. That medium thus driven back by the atom element as it moves round its axis is the space around it which is filled with millions of loose Anu; it also drives back denser parts of what is called astral matter. For instance the medium driven back by each separate funnel in Sodium is astral atomic matter.

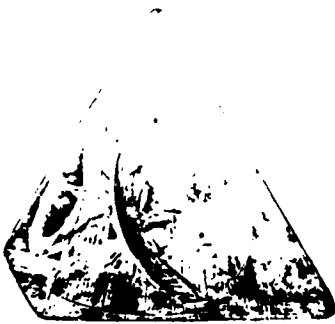
In the seven clearly defined forms it is worthy of notice that in divalent elements *four* funnels open on the faces of a tetrahedron; in trivalent, *six* funnels on the faces of a cube; in tetravalent, *eight* funnels on the faces of an octahedron. Here we have a regular sequence of the platonic solids, and the question suggests itself, will further evolution develop elements shaped to the dodecahedron and the icosahedron?



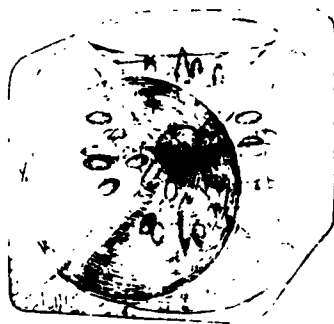
SPIKE



DUMB-BELL



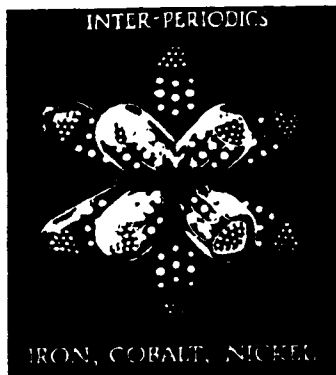
TETRAHEDRON



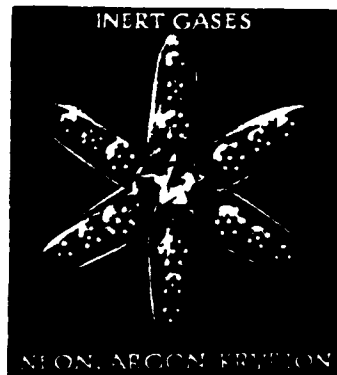
CUBE



OCTAHEDRON



BARs



STAR

FIG. 10. THE SEVEN FUNDAMENTAL FORMS OF THE ELEMENTS

The Five Platonic Solids

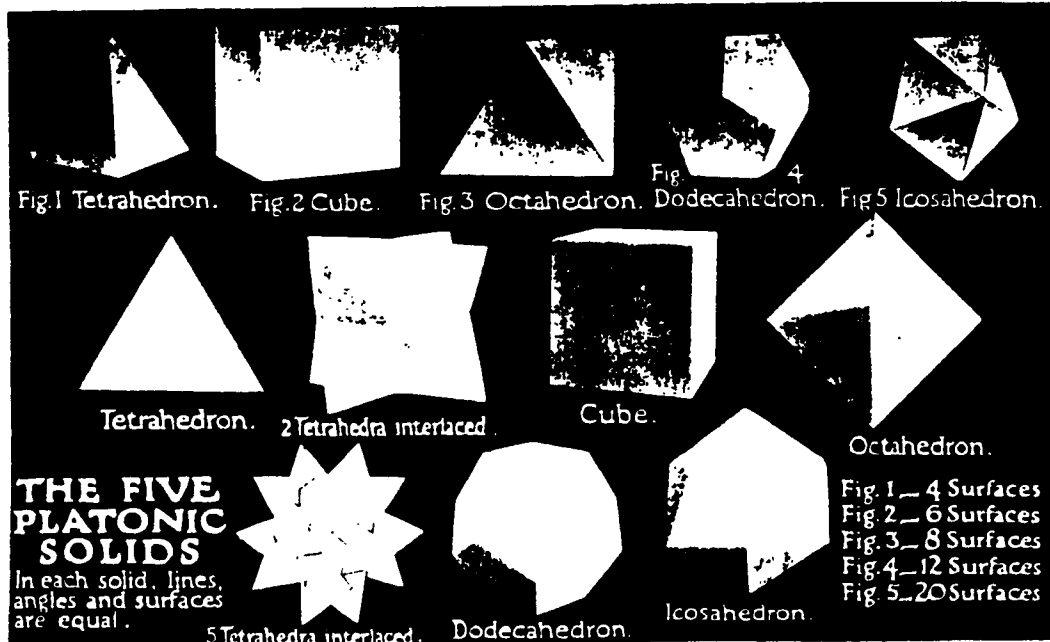
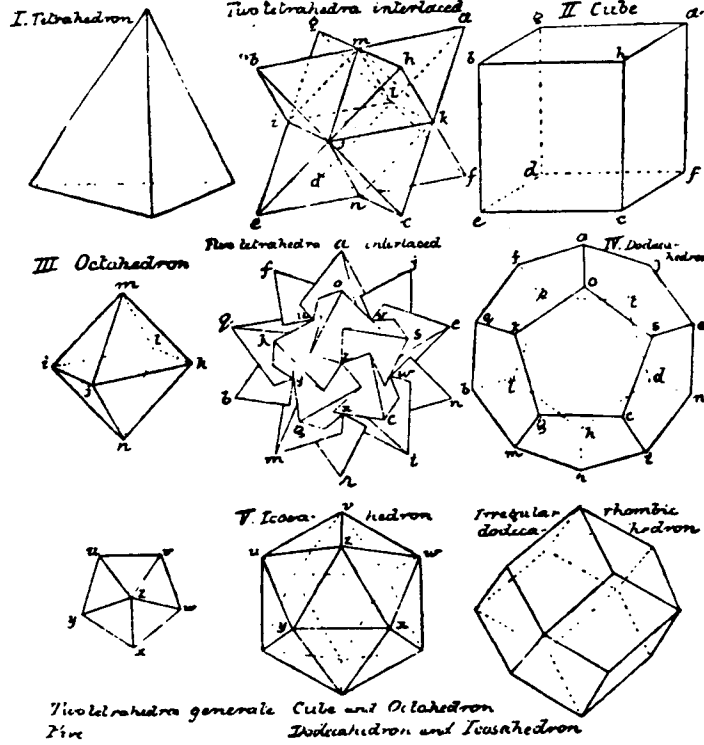


FIG. 11 THE PLATONIC SOLIDS



## THE PLATONIC SOLIDS

Fig. 11 shows the five Platonic Solids. It was seen during the investigations at Weisser-Hirsch that all the chemical elements, with the exception of Hydrogen, Oxygen and Nitrogen, appeared to be constructed in a way which suggested the well-known Platonic solids—tetrahedron, cube, octahedron, dodecahedron and icosahedron. No element suggesting the dodecahedron was found, but bodies which made the central nucleus in several elements had groups of six Anu at the twenty corners of the dodecahedron.

A most interesting fact was the discovery by a Spanish Theosophist, Senor Arturo Soria Y Mata, of the relation that exists between the tetrahedron, dodecahedron and icosahedron. He constructed models of five regularly interlaced tetrahedra, and the twenty points of these five tetrahedra, when joined, gave the surface of the twelve-sided dodecahedron, while the intersecting points of the tetrahedron and dodecahedron gave the corners of the icosahedron. He published a monograph, "Genesis," in Madrid in 1913 giving the diagrams and showing how to cut paper to make the various solids. There has never been any difficulty concerning the five solids, but it was he who for the first time gave the diagrams describing how to cut the twenty corners of five tetrahedra and join them together. It was only in 1922, when investigating the structure of Benzene, that the figure of the dodecahedron was found as the central uniting nucleus of Benzene.

## OCCULT CHEMISTRY

### IDENTIFYING THE ELEMENTS

One difficulty that faced the investigators was the identification of the forms seen on focusing the sight on gases. It was only possible to proceed tentatively. Thus, a very common form in the air had a sort of Dumb-bell shape. We examined this, comparing our rough sketches, and counted its Anu; these, divided by 18—the number of ultimate atoms in Hydrogen—gave us 23.22 as the atomic weight, and this offered the presumption that the atom observed was Sodium. We then took various substances such as common salt, in which we knew sodium was present, and found the Dumb-bell form in all. In other cases, we took small fragments of metals, as Iron, Tin, Zinc, Silver, Gold; in others, again, pieces of ore, or mineral waters. For the rarest substances, Mr. Leadbeater visited a mineralogical museum.

In counting the number of Anu in a chemical atom, we did not count them throughout, one by one; when, for instance, we counted up the Anu in Sodium, we dictated the number in each convenient group to Mr. Jinarajadasa, and he multiplied out the total, divided by 18, and announced the result. Thus: Sodium is composed of an upper part, divisible into a globe and 12 funnels; a lower part, similarly divided; and a connecting rod. We counted the number in the upper part: globe—10; the number in two or three of the funnels—each 16; the number of funnels—12; the same for the lower part; in the connecting rod—14. Mr. Jinarajadasa reckoned:  $10 + (16 \times 12) = 202$ ; hence:  $202 + 202 + 14 = 418$ ; divided by 18 = 23.22 recurring. By this method we guarded our counting from any prepossession, as it was impossible for us to know how the various numbers would result on addition, multiplication and division, and the exciting moment came when we waited to see if our results endorsed or approached any accepted weight. In the heavier elements, such as gold, with 3,546 Anu, it would have been impossible to count each Anu without quite unnecessary waste of time, when making a preliminary investigation. Later, it may be worth while to count each division separately, as in some we noticed that two groups, at first sight alike, differed by 1 or 2 Anu.

### THE PERIODIC LAW

The groups into which the elements fall when arranged according to their external forms prove to be very similar to those indicated in Sir William Crookes' classification. The simplest form of presentation of this periodic law is that described by Crookes in a lecture which he gave to the Royal Institution in London on February 18, 1887. Crookes visualizes a cosmic energy at work on cosmic substance which he terms "protyle". We can imagine this energy as of two kinds, one tending as if downwards, from above below, the other as if swinging pendulum-wise from right to left, left to right. The swing of the pendulum slowly narrows. Both forces are rhythmic, and they meet and cross at set places or periods. Where that happens, then "protyle" is affected, and an element is generated.

## BUILDING THE HEAVIER ELEMENTS

In considering the heavier elements, especially those belonging to the radio-active group, we find a certain variation from the orderly progress. All the way down we have been in the presence of an evolutionary force steadily pressing downward into matter along a spiral line. At certain points this force encounters the perpendicular lines which represent the various types or tendencies. We can imagine a group of nature spirits, marshalled under the orders of some higher Power, building these atoms according to the plan of the line to which they belong, and then scheming how to introduce the additional atoms which have been gathered since last the force crossed their line, while still retaining the main characteristics of their original plan.

Among the heavier elements it would seem that the power of the distinctive type is becoming less in proportion than that of the evolutionary force, for this latter is beginning to carry on with it certain characteristics from one type into another. Elements show affinity not only with those above it but also with those next before it on the spiral. The results seem in some ways to suggest the idea that an effort is being made to evolve certain features which shall when perfected be imposed upon all types. When we find two different attempts to build the same element it suggests two attempts one of which may be more suitable and therefore ultimately become permanent.

We find the central sphere of the chemical atom always increasing in size and importance until in the Radium group it seems to be the soul of the atom and the reason for which it exists—an active intensely *living* object rotating with wonderful rapidity, ever drawing in and throwing out streams of matter, and actually maintaining by its exertion a temperature higher than that of surrounding objects.

The process of making the elements is not even now concluded; Uranium is the latest and heaviest element so far as we know (1912), but others still more complicated may perhaps be produced in the future.

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A list of all the elements with the number of Anu in each, their weights and their characteristic shapes, is given later.

## THE PERIODIC LAW (AFTER CROOKES) FIG. 12

In the line depicting a pendulum swinging backwards and forwards, all the elements are marked in their order of weight; the lightest, Hydrogen, beginning the pendulum swing, and the heaviest, Uranium, (and possibly one or more heavier, yet to be discovered) closing the swing. Among the upright lines is a middle one, and there are four on either side. If the middle perpendicular line represents *no* valency, and also interperiodicity, and if the four lines on either side of this median line represent Valency 1, Valency 2, Valency 3, and Valency 4; then, it is found, as the elements are mapped out in the order of their atomic weights, at the intersecting points of the pendulum line and the nine upright lines, that the elements appear in order of Valency.

With a few exceptions, elements with similar external forms fall on the same vertical line. This may be seen on reference to Figure 12.

First come 4 elements which are formed before the swing of the pendulum begins. These are *ovoids*.

*The Spike Group*.—The atoms of each of the elements consist of a number of spikes radiating from a central globe in the centre of a plate-like form.

*The Dumb-bell Group*.—The atoms of this group consists of a central rod at the ends of which we find a globe. From each of the globes project 12 funnels. The whole making a form like a dumb-bell.

The elements in the dumb-bell and the spike group are those usually considered by chemists as having a characteristic valence of one or seven. They are found to right and left of the central line.

*The Tetrahedron Groups*.—The atoms of this group have four funnels, containing ovoid bodies, opening on the face of a tetrahedron. The funnels generally, but not always, radiate from a central globe. There are two tetrahedron groups at opposite sides of the central line of the pendulum swing. Their characteristic valence is two or six. The tetrahedron seems to be one of the favourite forms of nature and appears repeatedly in the internal structure. There are two tetrahedron groups, to right and left of the central line.

*The Cube Group*.—The cube appears to be the form of trivalent elements. It has six funnels containing ovoids and opening on the faces of the cube. There are two cube groups, at the left and right of the central line.

*The Octahedron Group*.—Here we find eight funnels opening on the eight faces of an octahedron. The elements are tetravalent. The two octahedron groups occur at the extreme left and right of the swing of the pendulum.

*The Bars Group*.—This is the characteristic shape of sets of three closely allied elements termed interperiodic. Fourteen bars, or seven crossed, radiate from a centre. This group occurs on the central line.

*The Star Group*.—A flat star, with five interpenetrating tetrahedra at the centre, is characteristic of this group, which comprises the inert gases. This group occurs on the central line.

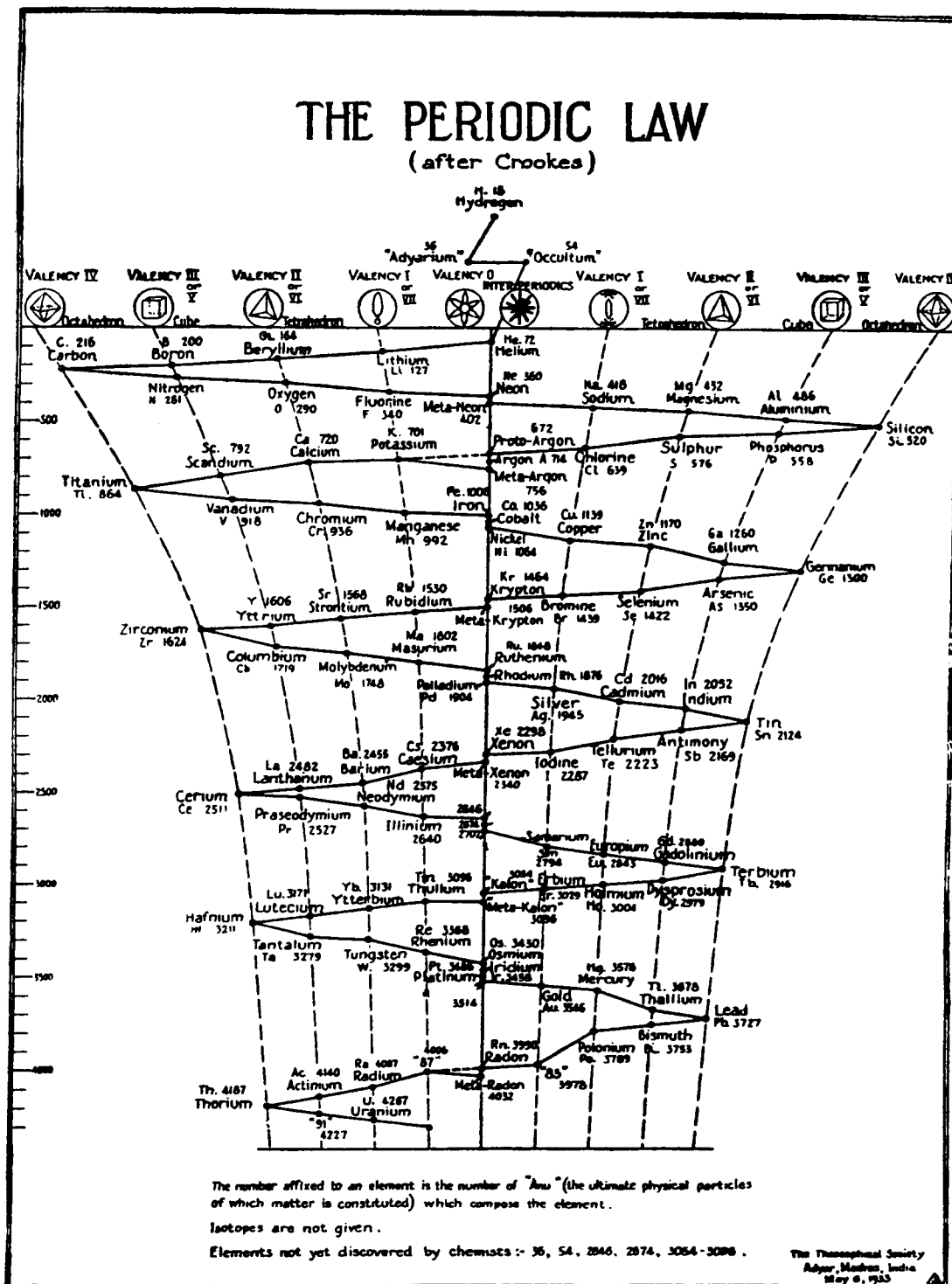


FIG. 12

NOTE BY C. JINARAJADĀSA

In the address presented by Crookes to the Royal Institution in London, on February 18, 1887, he gave a diagram of the pendulum swing, marking the place of each element at certain points in his diagram. Later he made a model of the pendulum swing in three dimensions, with two lemniscates, Fig. 13. It occurred to me that it was possible to make a model of the Periodic Law with four lemniscates. This I did, carefully planning that each rod in the illustration should be pasted with millimetre paper so as to map accurately the elements according to their weights, Fig. 14. My object with this model of four lemniscates is that some day, by careful study of the diagrams of the elements in *Occult Chemistry*, future students would be able to make cross-lines joining one element with another, since the heavier elements particularly have many groups in common. In this model the interperiodic groups and the rare gases appear on the central line. The elements of the octahedron group appear on the four outermost lines. The other groups fall into their places between.

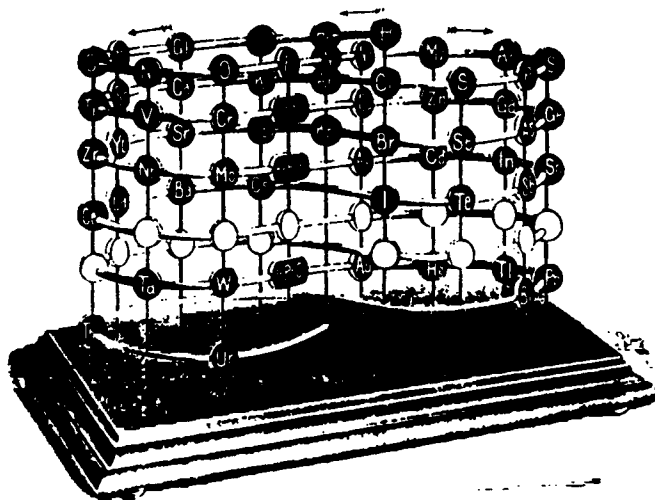


FIG. 13. THE PERIODIC LAW (CROOKES)

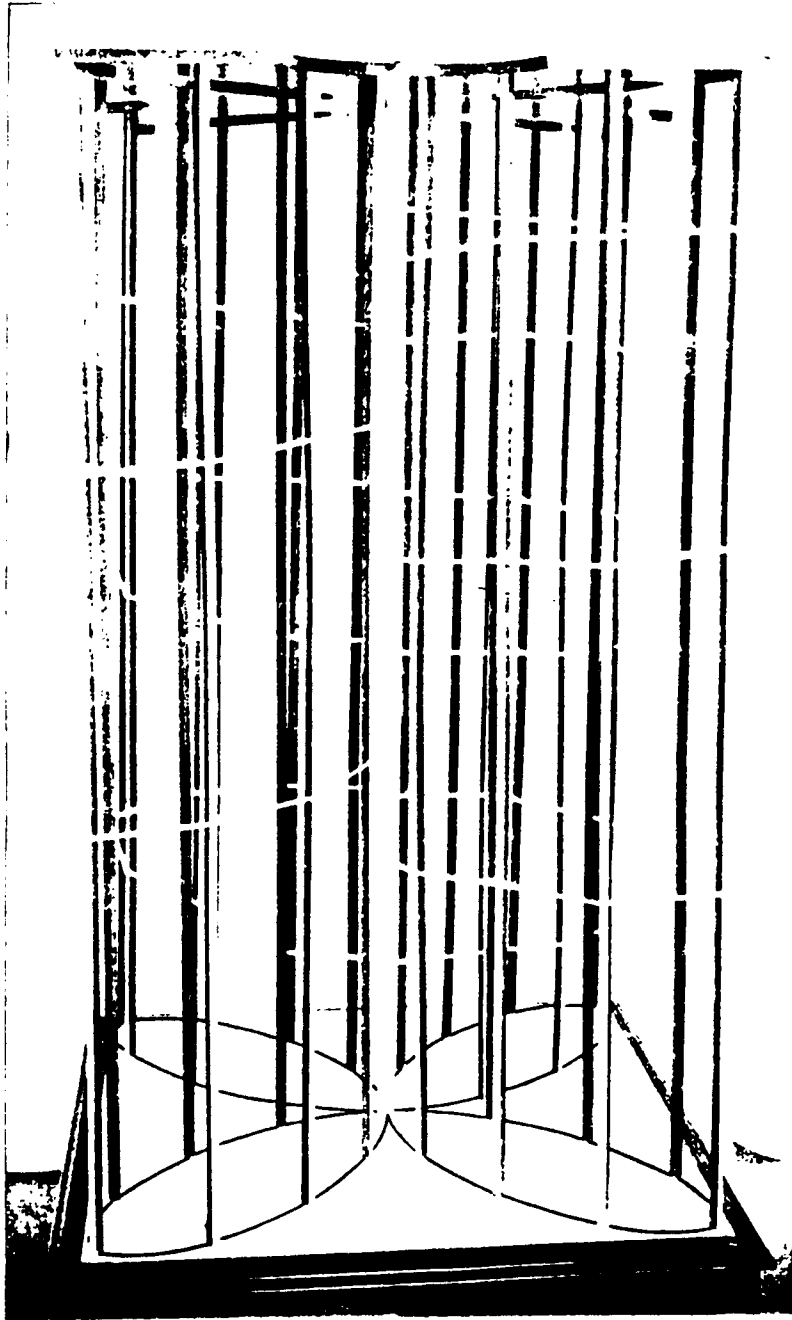


FIG. 14. THE FOUR LEMNISCATES