

AN EXAMINATION OF THE 'NIHĀYAT AL-TALAB'
AND THE DETERMINATION OF ITS PLACE AND
VALUE IN THE HISTORY OF ISLAMIC CHEMISTRY.

A Thesis presented for the degree of
Ph.D. in the University of London

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1954.

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ABSTRACT

In 1923 there was published the Arabic text of K. al-Muktasab, an alchemical work of the thirteenth century written by al-'Irāqī, with a translation and introduction by Dr. E.J.Holmyard. Jildakī, an alchemist of the fourteenth century, wrote his great work, Nihāyat al-Ṭalab, as a voluminous commentary on K. al-Muktasab. The present thesis is an attempt to examine the contents of the Nihāyat and determine its place and value in the history of Islamic chemistry. The importance of the Nihāyat lies in the main in its lengthy quotations from earlier authors whose works are not now extant. It is valuable also because it gives a clear account of the more important alchemical theories and tenets prevalent among the Muslim writers of the Middle Ages.

The copy of the Nihāyat which I have used consists of three quarto volumes amounting altogether to 1067 pages. The account given of each volume in the present thesis is not in proportion to its size, which is almost the same for all the three volumes; an attempt has been made to exclude, as far as possible, any unnecessary repetitions, and thus the account given of the third volume is only half the size of that of the first.

In the course of the Introduction a summary has been given of the theoretical and philosophical views of Jildakī; and an extensive Index has been prepared to facilitate detailed reference to the very large number of subjects mentioned in the thesis.

PREFACE

In the preparation of this thesis the purpose has been to give a complete survey of the contents of the Nihāyat al-Ṭalab and to determine its place and importance in the history of chemistry.

Jildakī, the author, being a true admirer of Jābir, adopted the latter's principle of the 'dispersion of the science', scattering his arguments concerning a particular subject in many different places. And owing to the fact that the Nihāyat is a commentary on another work, Al-Muktasab, it has not been possible to rearrange the material in a more orderly manner. However, to compensate for this lack of systematic treatment, imposed by the nature of the work, I have, in the course of the introduction which follows, given a summary account of the more important parts of the Nihāyat. Moreover, the index which comes at the end of the thesis should help to satisfy the need for any further information concerning the views of Jildakī and those whom he quotes.

In the translation of passages from the Nihayāt, rather than being strictly literal, I have tried to convey, as accurately as possible their actual meaning. But I fully agree, at least so far as my own translations are concerned,

with Dr. F. S. Taylor's apt remark that " since alchemy is a highly obscure subject, translations of alchemical works must contain many doubtful renderings and should not be trusted too far."⁽¹⁾

The quotations from Al-Muktasab have been given in single spacing and the word 'Sheikh' - that is how Jildakī referred to Al-'Irāqī - preceding each excerpt has been underlined in red in order to facilitate reference to the words and phrases which Jildakī tries to explain. No prominence has been given to other quotations.

There are very few notable discrepancies between the printed text of Al-Muktasab⁽²⁾ and the quotations given by Jildakī. Therefore, I have almost entirely relied on Dr. Holmyard's translation of the text and have, whenever necessary, given the alternative translation in square brackets.

I wish to express my immense indebtedness to Dr. E. J. Holmyard for giving me the benefit of his expert advice and for his great kindness in putting at my disposal his valuable collection of Arabic manuscripts. My grateful thanks are specially due to my tutor, Dr. D. McKie, whose generous help has always been available.

1. The Alchemists, New York, 1949, p. 242.

2. E. J. Holmyard, Al-Muktasab, Paris, 1923.

INTRODUCTION

AUTHOR

Jildakī is the last outstanding Muslim alchemist who flourished during the eighth century A.H. He was alive in Jamādī II, A.H. 743 (A.D. 1342). In spite of the fact that he was a prolific writer, very little is known of his life.

Hājjī Ḥalīfa (d. 1067/1657) gives his name as 'Izz al-Dīn Aidamur b. 'Alī b. Aidamur al-Jildakī.⁽¹⁾ In Kanz al-Iḥtisās, a book ascribed to Jildakī and lithographed at Bombay in 1891, he is referred to as 'Alī b. Muḥammad Aidamur al-Jildakī.⁽²⁾ In Nihāyat al-Ṭalab the name of the author is given as 'Izz al-Dīn 'Alī b. Aidamur b. 'Alī b. Aidamur al-Jildakī.⁽³⁾ The catalogue of the Royal Library at Cairo describes him as 'Alī b. Aidamur b. 'Alī al-Jildakī.⁽⁴⁾ This last variation is adopted by C. Brockelmann and

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1. K.al-Kašf al-Zunūn 'an Asmā' al-Kutub wa al-Funūn, Lexicon biographicum et encyclopaedicum . . ., ed. G.Fluegel, Leipzig, 1835-1858, No.10874.
 2. Holmyard's copy.
 3. Vol. v. p.396.
 4. Geschichte der arabischen Litteratur, ii. 138.

E. Wiedemann,⁽¹⁾ though, according to E. J. Holmyard,⁽²⁾ it
 "is almost certainly incorrect and probably arose through a
 confusion of Jildakī with an 'Alī b. Aidamir who died in
 A.H. 762."⁽³⁾

At the beginning of the first volume of the Nihāyat⁽⁴⁾
 Jildakī says that he spent more than seventeen years in the
 study of alchemy, travelled widely and visited learned men
 of his days in their dwellings.

WRITINGS

Jildakī, unlike Jābir and Razī, made no original
 contribution to chemical theory or practice. His importance
 in the history of chemistry lies in two things. Firstly,
 he was a prolific writer and in his voluminous commentaries
 gave lengthy quotations from earlier alchemists. As regards

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1. Zur Alchemie bei den Arabern, Erlangen, 1922.
 2. Aidamir al-Jildaki (Iraq, 1937, IV, 47-53).
 3. C. Rieu, Supplement to the Catalogue of the Arabic Manuscripts in the British Museum, 1894, p.535.
 4. See p. 1 below; index, Jildakī, life of.

his references to Adam, David, Hermes, Socrates and the like, there is no doubt that he was following the tradition. But he quoted also from Zosimos, Jābir, Rāzī, Ṭuḡrā'ī and others who were devoted students of alchemy. And it is with regard to the extant works of these latter that the accuracy of Jildakī's quotations can be checked. Allowing for the mistakes which were bound to occur in copying, it is safe to say that he reproduced the originals carefully and conscientiously. And thus the value of his quotations from the lost works of earlier alchemists becomes manifest.

Secondly, Jildakī is an outstanding exponent of the age when the scientific activities of Muslims had reached its zenith and begun to decline, when Europe was just awakening and its cultural influence had not as yet been felt in the East. Therefore, his numerous works, the majority of which are extant; provide us with ample evidence in solving the three following questions: 1. To what extent did Muslim alchemists draw their material from, what Kraus terms, the Graeco-Oriental tradition, which was richer than the original Greek? 2. How far did they improve upon what they inherited? 3. How much did European alchemists of the later centuries derive from Muslim sources? I do not propose to answer any of these questions here, but only hope that this attempt at

the examination of the contents of The End of the Search, the most important work by Jildakī, will be of some help towards their final solution.

With regard to the third question, however, I am inclined to think that the European alchemists, as distinct from genuine chemists, or technologists, made little addition, if any, to the material they drew from Islamic sources. In the hands of the Muslims, alchemy had already become sterile, and no headway could have possibly been made unless its methods and its immediate aim of goldmaking were changed. It was indeed this change which ushered in the advent of modern chemistry.

Now as to the extent of Jildakī's writings, our first informant is Hājjī Ḥalīfa.⁽¹⁾ The list given by Wiedemann⁽²⁾ is taken mainly from the latter.⁽³⁾ In Brockelmann are to be found references to extant works of Jildakī.⁽⁴⁾ Holmyard compiles a register of 21 books from Jildakī's own writings.⁽⁵⁾ The list given by Kraus containing 11 books in which references are made to the works of Jābir.

1. Loc. cit.

2. Loc. cit.

3. Loc. cit.

4. Loc. cit.

5. Jābir b. Ḥayyān, Cairo, 1943, 2, 193-4.

The following register, arranged in alphabetical order, is based on the lists mentioned above and includes, in addition, three books (Nos: 7, 19, 20) of Jildakī which, though mentioned in The End of the Search, do not appear in Holmyard.

1. Anwār al-Durar fī Īdāh al-Hajar.

MSS. - Berlin, 4187; Br. Mus. 1002, 1371;

Pet. Rosen, 205/1.

2. Buġyat al-Ḥabīr fī Qānūn al-Iksīr.

MSS. - Cairo, tab. 354; Pet. Rosen, 205/2.

3. Al-Burhān fī Asrār 'Ilm al-Mizān.

MSS. - Berlin, 4185 (4. Bd.) ; Br. Mus. 1657;

Cairo, tab. 35,43 ; Goth. 1295-7; Leyden, III, 209;

Paris, 1355; Pet. Rosen, 199.

4. Durrat al-Muḍiyya, a commentary on the Book of Silvery
(1)

Water. This is the same as Lawāmi' al-Afkār

al-Muḍiyya, otherwise, Šarh Risālat al-Šams ila

(2)
al-Hilāl.

Paris MS.

1. H.E. Stapleton, K. al-Mā' al-Waraqī (Mem. As. Soc. Bengal, 1933, XII, No. 1.)

2. See H.E. Stapleton, loc. cit.

5. Al-Durr al-Maknūn fī Šarḥ Qašīdat Di'l-Nūn.
MSS. - Cairo, tab. 315; Tal'at, kīm. 179.
6. Ġāyat al-Surūr fī Šarḥ al-Šudūr.
MSS. - Cairo, tab. 6, 115, 457;
Taymūr, tab. 73.
7. Al-Ġusl wa al-Tanqīya.
8. Kanz al-Ihtisās wa Durrat al-Ġawāss fī Asrār al-Hawāss.
MSS. - Berlin, 4186; Br. Mus. 987; Cairo, tab.
417; Cambr. Prest. nr. 60, p. 13; Goth. 2117;
Paris 6683.
9. Maṭāli' al-Budūr fī Šarḥ Šadr Dīwān al-Šudūr.
No copy known.
10. Al-Miṣbāh fī Asrār 'Ilm al-Miftāh.
MSS. - Lith. Bombay 1302; Cairo, tab. 26;
Goth. 1285 (fragm.); Leyden, 1274; Paris 2615;
Pet! Rosen, 200-3.
11. Natā'ij al-Fikr fī Ahwāl al-Ḥajar.
Bustānī MS.; Impr. Būlāq. Cf. Y.E.Sarkis,
Mu'jam al-Maṭbū'āt al-'Arabiyya, Cairo, 1928, col. 704.
12. Nihāyat al-Talab fī Šarḥ al-Muktasab.
MSS. - Berlin, 4184; Bodleian, I,458,640;
Cairo, tab. 350; Goth. 1289,4; Leyden, 1272;
Vienna, 1495; Tal'at, kīm. 196-7.

13. Qānūn al-Kabīr fī Hawāss al-Iksīr.
No copy known.
14. Risāla fī Tabā'ī' al-Arba'.
Cairo, V, 391.
15. Al-Šams al-Munīr fī Tahqīq al-Iksīr.
MSS. - Br. Mus. 1002/21; Pet. Rosen, 205/4.
16. Šarḥ al-Adhān fī Tahqīq al-Burhān.
No copy known.
17. Šarḥ al-Kalām al-Hallāj fī al-Šan'a.
Ālūsī MS., Baghdad.
18. Šarḥ Qaṣīdat Abū al-Asba' 'Abd al-'Azīz b. Tammām al-'Irāqī.
Extant.
19. Šarḥ K. al-Rāḥa, a commentary on the Book of Repose of Jābir.
20. Šarḥ K. al-Rahma, a commentary on the Book of Mercy of Jābir.
21. Šarḥ Ṣaḥīfat Hirmis, a commentary on the Book of Hermes. (1)
No copy known.
22. Šarḥ al-Šams al-Akbar li Bālīnās.
Berlin MS., 4188.

1. Holmyard: 'Possibly a commentary on the Emerald Table'.
Loc. cit.

23. Al-Sirr al-Maṣūn fī Ṣarh Biyūn.

No copy known.

24. Al-Taqrīb fī Asrār al-Tarkīb.

Paris MS., 2617.

25. Zahr al-Kimān.

No copy known.

Jildakī says in the Nihāyat⁽¹⁾ that he wrote a book on the projection, and another one on the properties of the Elixir.

Holmyard attempted to arrange Jildakī's works in a chronological order and found that "to reduce to order so many conflicting data is a hopeless task."⁽²⁾

I have used a modern copy of the Nihāyat, which was reproduced for Dr. Holmyard from the MS. in the Royal Library at Cairo.

It is appropriate to mention here that in 1933⁽³⁾ H.E. Stapleton, working in collaboration with M. Hidāyat Ḥusain,⁽⁴⁾ discovered that Part V, Section 1 of Al-Muktasab "has been 'lifted' bodily without acknowledgment from the Mā' al-Waraqī" of Ibn Umail, an alchemist of the tenth century.

1. See Index: Jildakī, works.

2. Loc. cit.

3. Loc. cit.

4. Pt., pp. 45-6; Tr., pp. 50-1.

The following abbreviations have been adopted in the foot-notes:

- Es. for The End of the Search, Holmyard's copy;
 Pt. for the printed text of Al-Muktasab; and
 Tr. for Holmyard's translation of the latter work.

SUMMARY AND CRITICAL ESTIMATE.

Definition and purpose of the Art:

Hermes was once asked, says Jildakī, to give the definition of the Art, and he answered: "It is to make apparent what is hidden and to hide what is apparent." Substances, according to Jildakī, possessed two sets of qualities: actual and potential. And it was the task of the alchemist to make, through appropriate operations, the hidden or internal properties of a substance come into the open and, if necessary, to force its apparent or external properties, one or all, to retreat into its interior. Alchemy was an 'occult' science and one should not expect to understand its methods and operations merely by reading the relevant books. The most important parts of alchemy were kept secret or were described in such a way that only

the intelligent and virtuous could understand them. The ultimate purpose of the Art was to prove that the Creator of all things, the source of knowledge and wisdom, was one and had no partners. And one who knew the secrets of the Art was a firm believer in the life to come and in the transmigration of the soul after the death of the body. But the immediate purpose of the Art was to cure diseased metals, remove their accidental qualities and make them perfect and healthy. So we see that alchemy was, from Jildakī's point of view, a philosophy, an outlook on life, and at the same time a practical art. Yet these two aspects of alchemy, the strongly pronounced religious tenor and the experimental technique, are inseparably fused together in the End of the Search. This is, indeed, a common characteristic of almost all the works on alchemy, written before or after Jildakī. I say almost, because in the earlier stages of the evolution of alchemy we come across alchemical works, such as the papyri of Leyden and Stockholm, in which the philosophical and theoretical element^s is completely absent, and gold-making is considered as a craft like, say, iron-smithery. It was in the later centuries that religion and philosophy permeated into alchemy and brought about a fundamental change in its character. Olympiodoros (end of the sixth century) for the first time introduced certain philosophical elements into the

alchemical theory and tried to derive the theory of transmutation from the Aristotelian idea of the four elements. This tendency was more and more accentuated in later authors and for Stephanos and his successor, the 'Anonymous philosopher', alchemy became genuine philosophy. This process was reversed with the rise of modern chemistry. Then, the practical part of alchemy, its laboratory technique, was incorporated in chemistry and its theoretical dictums, together with its unfruitful method of enquiry, were, after some hesitations, eventually discarded. Jildakī, on several occasions, expresses the view that the two component parts of alchemy, theory and practice, are equally important. One cannot achieve success in the Art, he assures us; without understanding its principles and theories. And one should "not neglect the practice; for theory without practice is useless: it is like a tree which bears no fruits." There is ample evidence in the Nihāyat with regard to the actual interest of Jildakī in experiments. (1)

Genuineness of the Art:

Philosophers of the past and present, says Jildakī, have substantially conformed to the opinion that the six

1. See Index, EXPERIMENTS.

metallic forms are essentially one in species, and this constitutes a convincing proof as to the genuineness of the Art and the possibility of transmutation. Avicenna in his famous book al-Sifā argued that the six metallic forms are all different species of a single genus, that is, mineral, and just as it is impossible to change a horse into a dog, so it is impossible to change silver into gold. Jildakī rejects this argument on "logical and philosophical grounds," but his reasoning is permeated with fallacy and leaves much to be desired. He gives examples of transformation in the vegetable and animal kingdoms. Grafting of shoots in fruit trees and metamorphoses in the life of silk-worm are regarded by him as genuine examples of transformation. But he also speaks of the production of pistachio by the combination of almond and turpentine, or the generation of snake from hair, which would have been easy for him to disprove if he had followed his own advice with regard to the importance of practice and observation. Jildakī divides the existencies into two classes: simple substances and compounds. The former do not transform except by combination. And as to the latter, they are divided into three groups, according as their constitution is balanced and compact, balanced and porous, or aberrant. This last

group consists of all the defective and diseased forms of the mineral, vegetable and animal kingdoms, which are amenable to treatment provided that they have not completely lost their 'adhesive moisture'. Examining the idea of colouring - that base metals are dyed and not transmuted into silver or gold -, advocated by Avicenna, Hunayn and others, Jildakī enters upon a long and confusing discussion, the core of which is this, that "since part of what the philosophers (alchemists) have said is true, therefore, it is permissible to accept all that they said as true!" In one place Jildakī draws a parallel between the art of glass-making and alchemy and considers their similarity as a 'manifest proof' of the genuineness of the latter. But if anything, this comparison, particularly with its emphatic stress on the dyeing of glass, gives more weight to Avicenna's idea of colouring than to Jildakī's belief in transmutation. No doubt Jildakī had other reasons to substantiate his belief in the genuineness of alchemy - I am referring to the Aristotelian ideas concerning matter, the views of the Stoics with regard to spirit, and such experimental evidence as the chemical knowledge of the day was not sufficient to repudiate. To these we shall refer later.

Relation of the Art to other branches of knowledge:

There are, according to Jildakī, two main sciences: 'the science of Astronomy', which deals with the phenomena of the heavens; and 'the science of Precepts', which treats of the phenomena of the lower world. These two sciences yield two 'results': the Art, which gives wealth and satisfaction to all people alike, enabling them to appreciate the immensity of the power of God; and the talisman, which bestows on man freedom to employ spiritual powers and is, therefore, the more important of the two. Jildakī remarks on several occasions that the Art is the product and synopsis of all other sciences; it embraces all branches of knowledge. "Know," he says, "that in this Art all other arts are potentially, or actually, or virtually, or nominally included." In another place he says that the Sages referred to the Art as the 'Middle World', distinguishing it from the 'Upper World! i.e., the world of the heavens, and the 'Lower World', i.e., the world of man. Thus, stationed in the middle of the upper and lower worlds, the world of the Art comprises all the mysteries in both of them. The arguments which Jildakī advances in order to prove this universal character of alchemy consist, in the main, of analogies between the latter and other branches of learning

and manual arts. Take medicine, for example. A medical man, he says, must know all the properties of the simple and compound drugs; he must also know about the age, the habits, the natural disposition, the strength, and the pulse of his patient. He must then find out about the nature of the disease by making an examination of the symptoms. Finally he has to decide on the kind and the quantity of the drugs which the patient must take in order to be restored to health. Now, all this, argues Jildakī, has its parallel in the Art. The purpose of the Art is to remove the accidental properties of the diseased metals and make them perfect. That is, the man of the Art must have a thorough knowledge of the nature of metallic diseases and of the drugs employed for their treatment. In like manner Jildakī compares alchemy to cultivation in plants, breeding in animals, and to other arts and sciences. It seems that he takes similarity to imply inclusion, that is, for example, if surveying and the Art are found to have certain points of resemblance between them, few and insignificant though these may be, the former could be considered as an integral part of the latter. From a logical standpoint this argument is open to many objections. But in dealing with the works on alchemy one should not expect to find much sound reasoning, unless one is sufficiently equipped and

gifted to enter with C.G.Jung into the subconscious of the
 (1)
 alchemist. With regard to arithmetic and geometry,
 Jildakī resorts to a different type of argument to prove their
 inclusion in the Art. Arithmetic is included in the Art,
 because the weights of the drugs are represented by numbers;
 and the inclusion of geometry is justified on the grounds that
 the alchemist has to know about the shape, or the area, or
 the volume of the apparatus and furnaces with which he works.
 In this way it is, indeed, possible to argue that every
 branch of knowledge includes all other branches. The
 reasons which Jildakī puts forward with regard to the
 inclusion of music and the science of war in the Art are
 still less convincing. He includes music in the Art because
 on distillation the drops of pure water as they enter into
 the receiver produce the sound of a trumpet. And with
 regard to the inclusion of the science of war, he quotes a
 poem of Sāhib al-Šudūr, in which the latter describes the
 stages of the operation as if he were reporting the progress
 of a battle. Yet these considerations do not detract from

1. Jung in his work Psychology and Alchemy, London, 1952,
 pp. 370, 413, 438, makes references to al-Muktasab in
 order to prove some of his contentions.

the value of our contention, already referred to, that alchemy was a philosophy as well as a practical art. For the arguments we advance today to prove the universal character of alchemy need not be the same as those put forward by the alchemists themselves. Today we can look back and study not only the works on alchemy, but also the alchemists who wrote them.

Terminology of the Art:

The alchemists, says Jildakī, were in the habit of giving different names to the same thing or calling different things by the same name. That is why one has to be careful so as not to be deceived 'by the apparent meaning of the words'. Each name given to a substance is usually an indication of a certain property, so that the more varied the properties of a substance, the more numerous its names. The presence of 'so many properties in the stone' explains why it has a multitude of names. It is also a common practice among the alchemists, according to Jildakī, to give to a substance the name of its predominant component. For example, substances in which 'the oily moisture' is predominant are referred to as arsenics, or sulphur if it is still more preponderant. Moreover, when a substance passes through different stages of the operation, it acquires, with

every change in its properties, a new name while retaining at the same time the old ones. And it is left to the reader to find out for himself what a certain term implies in different contexts. In spite of all this, I think it is to some extent possible to reduce the number of alchemical terms by a process of selection, that is to choose one among a multitude of names describing the same substance and dispense with the rest. There are, for example, over seventy different names employed in the Nihāyat to describe a much smaller number of 'waters' (see Index); and in the descriptions of Jildakī we find enough evidence to enable us to reduce the number of these names to a manageable proportion. This reduction of the number of names, provided that it is carried out with sufficient care and accuracy, would perhaps make the works on alchemy much easier to read. Evidently Jildakī himself was confronted with the difficulty of understanding the terminology of alchemy; for he says: "In spite of our knowledge, we studied the works of the Sages and their principles, and performed many experiments for a period of eight years before we came to understand the meaning of the technical words used by the Sages in their operations, and before we learned what was meant by the stone and the matter!..

Theories and Tenets:

1. The Theory of Four 'natures'. Everything on earth is made up, says Jildakī, of the four natures, namely, 'hot', 'cold', 'dry' and 'moist'. At the beginning only two of the four natures or 'maternal qualities' existed; they were 'hot' (the oldest and the most active nature) and 'cold', which followed one another in circular motion. Then 'hot' dissolved the 'cold' and as a result of this 'dry' and 'moist' came into being. 'Dry' attached itself to 'hot', and 'moist' attached itself to 'cold', on account of their similarity. 'Hot' and 'moist' are the natures of life or generation, 'dry' and 'cold' are the natures of death or corruption. From the four natures originate, by 'motion and rest', the four elements, i.e., fire, air, water and earth. If there were no change in the composition of things, that is, if there were no motion or interplay of maternal qualities, there would be no corruption, only generation. But since there is motion, generation and corruption constantly follow one another. Jildakī quotes Jābir as saying that "hotness and coldness are active in form, moisture and dryness are passive in matter." Every generation, according to Jildakī, results from the combination of four 'principles', two of which

water and earth, are 'apparent' and the other two, fire and air, 'hidden'. The two passive natures, moisture and dryness, provide the material of all things in the world. Yet nothing will come into being unless the two active natures, hotness and coldness, exert their influence and supply the material with form. A substance is said to be stable and have a sound constitution if there is an equilibrium between the opposing natures of which it is composed. Heat is the opposite of cold and dry is the opposite of moist. If, for example, the heat and cold are not balanced, the contest which ensues between them impedes the substance from attaining to its state of perfection. In metals this state is represented by gold. And since Nature strives always towards perfection,⁽¹⁾ the only thing the alchemist has to do in order to transmute the base metals into gold is to facilitate and speed up a completely natural process which goes on all the time in the hollows of the earth. Jildakī never tires of repeating that "the sages imitate in their operation the process of Nature in the generation of the world." It must be mentioned here that in one place

1. Aristotle's dictum.

Jildakī agrees with Jābir that "water is the root of the roots," an opinion which takes us back to Thales. But we must not forget that, in the words of J. Read, "strict consistency is a missing element in alchemy."⁽¹⁾

2. The Sulphur-Mercury Theory of Metals. This theory, the germ of which is contained in Aristotle's Meteorology, was first taught by Jābir and Rāzī. In Jābirian writings the vaporous and smoky exhalations of Aristotle are identified with mercury and sulphur respectively, and the general idea is elaborately developed into a theory. Though all things, says Jildakī, have a common origin and are composed of the four natures, there are groups of substances which have a nearer common progenitor than the maternal qualities. The seven metallic bodies, for example, originate from sulphur and mercury and to the extent that each one of them is composed of these two essences, it exhibits the properties of that essence. This applies to sulphur and mercury themselves: they are partly earthy, partly watery, partly fiery, and partly airy. But the sulphur and mercury from which metallic bodies originate are not the ordinary substances bearing those denominations. Mixing of ordinary sulphur and mercury would not, asserts Jildakī, produce any

1. For the origin of Jildakī's theory of four elements see pp. XXXII - XXXIV.

of the metallic bodies. The latter originate from sulphur and mercury when these are still in the state of formation and have not yet coagulated completely. In other words they originate from sulphur and mercury 'before sulphur becomes sulphur' and 'mercury becomes mercury'. "Mineral bodies," says Jildakī, "originate only from the steam and the smoke, from uncoagulated mercury and uncoagulated sulphur, or, to tell the truth, fusible, mineral bodies originate from nothing but the water and the oil. In the blind (hollows of the earth) the gentle (natural) heat causes the water to ascend to the top, carrying the oil with it. There, because of proximity to coldness, it cools down and descends, alighting on the part remaining at the bottom. So the natural heat matures it, and it constantly moves up and down, part of it tumbling over the other. Then it gradually becomes more and more gummous, thick and hard, until it appears as a molten, malleable body." At first, continues Jildakī, only a small part of the 'oily water' coagulates, and this then acts as a leaven which gradually grows by feeding upon the remaining part. The 'molten malleable body' hardens gradually until it develops into an actual metal. When the smoke and vapour are pure and there is an equilibrium between the four natures, gold is generated; and when

coldness prevails over hotness silver is produced. Jildakī explains the origination of other metallic bodies in terms of two factors: proportion of each nature in the 'oily water' and the amount of impurities in the mines. Jildakī considered the process of the generation of metallic bodies to be reversible. "Know," he says, "that gold originates from steam and smoke, and these in turn originate from the philosophers' gold. Thus, from steam and smoke are produced mercury and sulphur, and from these gold is originated in its mine If mercury is continuously heated with a gentle heat, it becomes gold, and if gold is continuously heated with a gentle heat, it becomes mercury again. Just as the date-stone comes from the date-palm, and the date-palm from the date-stone..." We notice that, Jildakī says, if "mercury is continuously heated", that is, he leaves out the sulphur. This cannot be described as a slip of the pen; for on several other occasions Jildakī expresses the same idea in different words: he gives to mercury a more prominent place than sulphur. Mercury, he says, is the root and the raw material of fusible bodies. The latter originate from mercury, just as animals originate from sperm, or plants from seeds, or stones from the water. Jildakī

seems to favour the expansion of the sulphur-mercury theory to cover all mineral, as well as vegetable and animal, substances. But his views in this respect often seem to be contradictory. Calling Socrates and Jābir to witness, he asserts that alchemists extracted mercury and sulphur from all substances. He adds that mercury and sulphur may appear in many different forms, and a great number of substances can act as substitutes for them; 'oil' and 'tincture', for example, can represent mercury and sulphur respectively. Crumbly bodies, he says, are closely related to metals and they originate in the mines from the 'oily water' when there is a sharp increase in dryness. Again, according to him, matter originates from vapour and smoke". On the other hand, he makes several statements to the effect that, just as plants originate from earth and water, so metals originate from smoke and vapour.

3. The Doctrine of Four Principles. Apart from the four natures and the four elements, Jildakī speaks of four 'principles', which he sometimes equates with the former and at other times with the latter. He also says that the four principles are "the solvent water, the unflammable oil, the active tincture and the stable body!"

In another place he says that they are "arsenic, sulphur, mercury and sal ammoniac"; or still in another place he considers them to be "western mercury, eastern mercury, volatile sal ammoniac and stable earth." He adds that to every one of these principles the Sages have given many different names and goes on to enumerate some of them. The explanation lies perhaps in the common practice of the alchemists to give to substances the name of their supposedly predominant component. In this way were formed various categories of substances - usually four, representing the number of natures -, each of which possessed an excessive proportion of one particular quality. Now the proper names of those substances which fell into one category, together with numerous adjectives describing their common quality, were interchangeable. That is, for example, 'mercury' was called 'solvent water', or vice versa; and alternatively either of them were simply referred to as 'water' or 'moist'. Thus, a 'principle' was that which contained an excessive amount of one nature or one element, but it was not the nature or the element itself.

4. The Theory of the Balance. This theory was first set forth in the K. al-Baht of Jābir with the purpose of reducing all the data of human knowledge to a system of

quantity and measure. The problem that Jābir proposed to solve was to measure the quantity or the force by which the natures are represented in different substances. Certain ancient medical theories and particularly that of Galen were based on similar ideas. The system of Galen was exclusively based on the evidence of the senses, whereas the Jābirian approach to the solution of the problem was not at all empirical. In order to find the exact amount of each nature in substances Jābir resorted to the analysis of the letters of the alphabet. He also assigned a 'value' or 'power' to each substance, expressed invariably in terms of the power of the Elixir which was usually considered to be 100. The power of each operation he denoted by a special fraction. Accordingly sublimation corresponded to the number $\frac{1}{50}$, solution to $\frac{1}{70}$, melting to $\frac{1}{200}$, etc. Now, to transform a bar of gold (value 20) into Elixir (value 100) without adding other ingredient, it must be submitted to 1000 treatments of melting ($20 \times \frac{1000}{200} = 100$). The power of an alloy was considered to be equal to the sum of those of its components, so that by the mixing of different metals it was possible to produce the Elixir. Jildakī says that the Art is divided into two branches. One of these, called 'The Operation', deals with the preparation of the Elixir

from the raw material by a process based on the imitation of Nature. It is with this branch of the Art that Jildakī mainly concerns himself in the Nihāyat. As to the second branch of the Art, it is called the 'Science of the Balance and Combination', and deals with the natures, with the quantitative relations, and with similarities and diversities of different things. Jildakī's references to the Theory of the Balance are few and insignificant; ⁽¹⁾ they are usually contained in quotations which he gives from Jābir. In the course of his explanation with regard to one of these quotations, he says that the Science of the Balance consists of two parts, 'major' and 'minor'. The latter concerns the production of gold without the help of the Elixir, and the former deals with the preparation and subsequent projection of the 'tincture'. Jildakī explicitly points out that he did not spend much time studying the Theory of the Balance and, therefore; does not find himself in a position to enlarge upon the views of Jābir.

5. The Doctrine of Hylozoism and a comparison between Jildakī's views on matter with those of Jābir. The theory of four elements as described by Jildakī is no doubt derived directly or through intermediaries from the Generation and

1. K. al-Burhān of Jildakī is devoted exclusively to the Science of the Balance.

Corruption and particularly from the Meteorology of Aristotle.

In fact the natures of Jildakī more than those of Jābir bear resemblance to the elementary qualities of Aristotle.

Jildakī, unlike Jābir, speaks very little, at least in the Nihāyat, about the isolation of individual natures by operation. Aristotle regarded the elementary qualities only as logical abstractions, while Jābir conferred on them a concrete, independent and separate existence. Similarly, the elements of Jābir possessed a real constitutive character and took their place in the hierarchical order of beings above the elementary qualities, whereas Aristotle sometimes hesitated to call the primary bodies of his physics by the name of elements, because their reciprocal change did not permit them to be considered stable things. Now the only element that Jildakī considers as being stable is earth. Fire, air and water, he says, are not stable and steady in isolation. In describing his particular theory of elements Jābir was following the Stoic tradition, according to which, the qualities in general and elementary qualities in particular are considered as bodies. In comparison with Jābir, Jildakī seems to have been less influenced by the Stoic tradition; and his references to the idea of the association of the planets with the metals, and particularly

his views with regard to the part played by spirit in transmutation, support this contention. Though he describes in detail the relationship which exists between the individual planets and their metallic counterparts, yet his descriptions in this connexion are usually preceded with some such phrases as "according to the Sages". Again though he often speaks of the male and female components of mineral substances, of the seed of gold, of the departure of spirit from metals and their death and resurrection, yet he also says that metals have no seeds to be sown like plants, and that they are not of two opposite sexes like animals. But immediately after making this last statement, he adds: "Nevertheless the philosophers discovered that their stone is of two kinds one of them male and the other female." The explanation, to my mind, is that the majority of parallels which Jildakī, in imitation of his predecessors, drew between the animate and inanimate matter had for him little more significance than a means of expression. In his explanation of the passages from al-Muktasab, he adopts a matter of fact attitude and becomes confused only when he fails to account in clear language for the subtle ideas behind al-'Irāqī's words. There is no doubt that he considered the theory of four elements and sulphur-mercury theory of metals as practical propositions

which, though valuable and helpful, did not completely account for the phenomena of Nature. For after discussing the actual conditions under which a particular metallic body is formed in the mine, he states that the secret of generation is not completely known to the Sages and it never will be: it is beyond human intelligence and understanding. In his classification of mineral substances Jildakī adheres in the main to the system of three distinct classes, i.e., bodies, souls and spirits, which was prevalent among the Muslim alchemists. Soul and body, according to Jildakī, do not combine with each other unless they are helped by pure spirit, which plays the part of an intermediary. This idea of intermediary or reconciliator is also found in Paracelsus. Jildakī defines matter as "a simple corporeal substance capable of combination". As to the prime matter, "take", he says, "any material which is composed of two parts, one of them dissolved in the other; the solvend is called prime matter, and the solvent, form." He states in another place: "Matter is that in which the prime matter exists potentially. Prime matter is that in which the Elixir exists potentially and, to some extent, actually." He does not, on the whole, express himself clearly with regard to the relation between matter and prime matter. For

he defines the latter in one place as anything which is capable of entering into combination, and of moulding the form; and this is very similar to the definition he gave concerning matter. Jildakī divides the metaphysicians into two groups, one of them advocating the doctrine of indivisible particles,⁽¹⁾ and the other, contending that substances are composed of prime matter and form. After discussing the merits and shortcomings of each group, he comes to the conclusion that "the truth lies between the two groups, and is yet hidden from them; for God wishes to perplex men's minds with regard to the understanding of that which precedes perception." Referring to the atomic theory of Democritos, in connexion with a passage quoted from Ṭugrā'ī, Jildakī comments: "A great number of philosophers thought that Democritos referred to the world of Existence when he spoke of indivisible particles. That is not so. What he actually had in mind was the world of the Art. And this, indeed, is composed of particles indivisible in practice." All this goes to prove that Jildakī was a man with a practical and, at the same time, a religious turn of mind. He cared for theories in as much as they helped him to form a somewhat rational picture of the workings of Nature. As for the loop-holes he happened to discover

1. See Index, particles, indivisible.

in these theories, - there were many which comfortably escaped his attention -, the Ever-present Allah was always there to accept the responsibility.

Transmutation and some of the chemical operations:

Here we shall only concern ourselves with those methods of transmutation described in the Nihāyat, which could find expression in the language of modern chemistry. And among the numerous operations to which Jildakī refers we shall treat only of combination and combustion.

Jildakī believed that mixing of metals with one another is one way of achieving transmutation. But of course there were always useless ingredients with enigmatical names, which were added to the mixture of metallic bodies and were usually given the credit of imparting the necessary tincture. Jildakī agrees with al-Īrāqī that none of the metals has extra colour to tincture others; nevertheless he considers it possible to increase the tinctorial power of gold and silver, so that they become capable of colouring the base metals. According to Jildakī pure, purple gold can be produced by mixing the philosophers' silver, lead and gold. ⁽¹⁾ When, he says,

1. The calces of base metals were usually considered by Jildakī to represent the philosophers' variety of them.

the philosophers' iron, "that is, pure steel," is mixed with silver, gold is produced; and when it is mixed with gold, it acquires all the qualities of the latter. The weight of each metal in different alloys is determined by the application of the theory of the Balance. Colour played an important part in Jildakī's conception of transmutation. He says that gold is differentiated from silver by two things only: colour and 'heaviness'. He often leaves out the latter difference and does not seem to have had any practical knowledge about it; for he considered wine to be heavier than water.

Amalgamation of metals with mercury was also regarded by Jildakī as a method of transmutation. Mercury, he says, when purified, "moistened with pure oil of sulphur" and amalgamated with gold, will combine permanently with the latter and will tincture silver. Similarly, amalgam of silver when "moistened with the oil of arsenic", will form a permanent union with silver and will tincture copper.

"But from other bodies when amalgamated, no benefit is derived, unless they are first cleansed and purified completely."

With regard to combination Jildakī says that "things unite (or strengthen) their like and oppose (or weaken) their unlike." Opposite things, that is things which are

completely different in all respects, never combine with one another. Combination takes place between two things when they are 'similar' in certain respects and 'dissimilar' in others. Jildakī quotes Jābir as saying that the cause of affinity is the moisture contained in substances. Glass, says Jildakī, melts like metallic bodies, but it does not combine with them because its soul is dry and its oiliness insufficient. A perfect combination between two substances results in the formation of a homogeneous compound. Dissolution is one form of combination, provided that no precipitate is formed when the solution is left to stand for some time. Jildakī quotes Aristotle as saying that it is not possible to compound a thing fortuitously: there must be a natural relation between the solvend and the solvent. Jābir in his K. al-Hawāss applied the idea of 'similarity' and 'dissimilarity' to all the species of the three kingdoms. With regard to the 'sympathy' and 'antipathy' between animals he said for example: "When a scorpion sees a lizard, it dies immediately"; or "When the serpents, vipers and other similar animals hear the voice of the owl they abandon their nests in flight."⁽¹⁾ In the Nihāyat we find none of these speculations. Like the ancient authors, Jābir had a

1. Kraus, Jābir b. Hayyān, Cairo, 1942, 2, 66.

predilection for the medicaments derived from animal bodies, and he insisted that the Elixir can be produced from animal, as well as vegetable and mineral, substances. Jildakī, on the other hand, emphatically asserts that the production of the Elixir from animal substances is extremely difficult, if not impossible.

"The cause of combustion of the particles of the stone", according to Jildakī, "is the inflammable oil which it contains." In another place he says that "sulphurs and arsenics ignite by fire, because of what there is in them of inflammable oils." Excess of hotness also causes combustion and prevents generation. In the inflammable oil of Jildakī we can see the terra pinguis of Becher, which was later given the name 'phlogiston' by Stahl. Jildakī quotes several passages from the K. al-Ihrāq (The Book of Combustion) of Jābir. In one of these the latter says that there are two kinds of combustion: "sensuous and psychical, the former concerns the body and the latter pertains to the spirit." Jābir adds that two things may happen in combustion: either the body burns away completely and the spirit is set entirely free, or only the accidental qualities are removed by the fire and the body is left in a healthy state. In either case Jābir considers combustion beneficial on account of its

purifying effect. Combustion, according to Jildakī, may be effected either by 'the water' (watery combustion) or by the fire (fiery combustion). He agrees with Jābir that combustion is one way of effecting calcination, and in one place he considers them to be one and the same chemical process. He maintains that combustion and cohesion cannot be explained on the basis of "the idea that things are composed of prime matter and form", and he asserts that the purpose of the atomists in evolving their theory was "to substantiate combustion and cohesion".

References to Aristotle and Jābir:

Jildakī refers in the Nihāyat to two works of Aristotle: K. al-Aḥjār (The Book of Stones) and Samā^o al-Tabī^oī (The Physics).⁽¹⁾ According to Holmyard the Latin work Liber de Mineralibus Aristotelis "is a translation - more or less satisfactory and not always complete - of passages occurring in Avicenna's great work The Book of the Remedy". Of the three quotations which Jildakī gives from K. al-Aḥjār, none of them corresponds with those passages of K. al-Šifā⁽²⁾ which are translated by Holmyard. The first quotation remotely

1. K. al-Šifā, Paris, 1927, p. VI.

2. See p. 285 below; Es., Vol. II, p. 49.

corresponds with passage [26] of the Arabic text of K. al-Ahjar edited by Ruska ; ⁽¹⁾ the second quotation ⁽²⁾ is a brief version of passage ⁽³⁾ 27 ; and the correspondence between ⁽⁴⁾ the third quotation and passages 47. and ⁽⁵⁾ 49 is also remote. With regard to the quotation Jildakī gives from The Physics of Aristotle, ⁽⁶⁾ there is no doubt that the idea of a 'natural relation' between things was entertained by the Peripatetic school, but I have not been able to find an exact version of Jildakī's quotation in Aristotle.

There are forty-two books of Jābir mentioned in the Nihāyat, and two of these are not included in the list of Jābirian writings given by Kraus. ⁽⁷⁾ Jildakī was a great admirer of Jābir and gave numerous and lengthy quotations from his works. Jildakī's writings, particularly Nihāyat

1. Das Steinbuch des Aristoteles, Heidelberg, 1912, p.112.
2. See p. 288 below; Es., Vol. II, p. 54.
3. Loc. cit., p. 113.
4. See p. 349 below; Es., Vol. II, p.204.
5. Loc. cit., pp. 118, 119.
6. See p. 419 and also p. 75 below.
7. See p. 519 below.

(1).
and K.al-Burhān, constitute one of our sources with regard to the life of Jābir.

"On voit", writes Kraus, "que les indications de Jildakī s'accordent presque dans tous les détails avec ce qu'on lit dans les écrits mêmes de Jābir. Cet accord ne leur confère cependant pas la valeur d'une source originale. Alchimiste de basse époque, grand admirateur de Jābir et qui prétend avoir réuni près d'un millier de ses ouvrages, Jildakī reproduit fidèlement ce qu'il trouve dans ces sources, sans guère recourir à des informations indépendantes."⁽²⁾

This is, I think, an unfair criticism of Jildakī. True, that he greatly admired Jābir, but, as was pointed out on a few occasions in previous pages, he was by no means a blind follower. Jildakī had the highest praise for Ṭuḡrā'ī, and yet he did not hesitate to criticize his views and even question his ability to understand alchemical writings.

There is a great deal of similarity between the ideas contained in the quotations from Jābir given in the Nihāyat and those found in the Latin works of Geber. To some of

1. Cf. Holmyard, Science Progress, 1925, 19, 415-426.

2. Loc. cit., Vol. I, p. XLIII.

these points of resemblance I have drawn attention in the course of this thesis, but I do not consider them as constituting enough evidence for establishing a close connexion between the writings of Jābir and the Latin works of Geber. Perhaps an examination of all the extant works of Jildakī would help to settle this and many other questions with regard to the history of chemistry in Islam. This is what I propose to do later.

VOLUME I.

IN THE NAME OF GOD, THE COMPASSIONATE, THE MERCIFUL!

After praising God, his prophet Muhammad, and the latter's family and disciples, Jildakī goes on to describe the difficulties he was confronted by and the troubles he encountered in his attempt to become initiated in theology and the Art. He spent more than seventeen years, day and night, staked a great deal of wealth, read and collected a large number of books, visited the learned men of his days in their dwellings in Iraq, Egypt, Yemen, Hejaz, Syria, and other countries. In the end, one of these learned men tried, out of jealousy, to mislead him. Realizing this, Jildakī was able, by the force of his reason, to expose the absurdity of the teacher's argument; whereupon the latter, overwhelmed with shame, embraced the intelligent pupil and told him that he only wanted to know how clever he was.

Jildakī stresses on the common belief of the alchemists that the Art must be kept secret from those who do not deserve to know it; otherwise there will result corruption of the society and annihilation of the world. On the other hand any failure to transmit the knowledge to those who are qualified would, as it is the case in the present day, says Jildakī, abase the philosophy and prepare the ground for the jugglers and charlatans. The latter try to convince the

poor, under oath, that in alchemy lie the riches of the world; and yet they could not agree between themselves as to the original substance of the Elixir. Egg, gall-vesicles (Marā'ir), blood, skull, hoof, horn, urine, excreta (ḡadirat), salts, sulphurs, mercuries, mineral, plant and animal substances, are in turn favoured, without reason, by one or another group. The stupidity of these jugglers and their followers, however, leads them astray; their time is wasted and they suffer great losses.

To satisfy the desire of those who are determined to become initiated in theology and the noble philosophical Art, Jildakī writes his book Buḡyat al-Ḥabīr (The Aspiration of the Expert) and later, Šams al-Munīr (The Luminous Sun). He did not know the author of the K. al-Muktasab (The Book of Knowledge Acquired), but found the work to be perfect in its theoretical and experimental aspects. And yet the brevity of its exposition and the concise form of its statements, observed Jildakī, made the K. al-Muktasab very difficult to understand for the beginners. It was the desire to overcome this obstacle that incited Jildakī to write his great Nihāyat al-Ṭalab (The End of the Search), as a voluminous, explanatory appendix to the K. al-Muktasab. However, as Holmyard points out, "his explanations are not seldom more obscure than the passages they are designed to illuminate". (1)

1. E.J.Holmyard, Makers of Chemistry, Oxford, 1946, p.82.

K. al-Muktasab is arranged in five parts comprising nineteen sections: part I has 5 sections, part II 4 sections, part III 2 sections, part IV 5 sections, and part V 3 sections.

Nihāyat consists of three volumes. Volume One consists of three books: book I is divided into 5 chapters, book II into 4 chapters, and book III into 2 chapters. Volume Two consists of two books: book I is divided into 4 chapters, and book II into 3 chapters. Volume Three consists of two books, each divided into two chapters. Besides, each volume has a prologue and an epilogue.

Jildakī's method is, as a rule, to quote a paragraph from K. al-Muktasab and then try to explain it either in his own words or by making innumerable and lengthy quotations from different authors, such as Jābir, Khālid, Rāzī, and others. As to the authenticity of his quotations and historical facts, "his general trustworthiness can be safely assumed".⁽¹⁾

Prologue to the First Volume

This prologue opens with a quotation from the preface to Al-Muktasab, whose author is always referred to as the Sheikh by Jildakī.

1. Holmyard, op. cit., p.82.

Sheikh: "I have described in this book [I have composed this book describing in it] the theory of the Art of Chemistry and its practice on the prime matter suitable for the purpose after having previously established proofs of the possibility of the Art. I have described the quantitative and the qualitative in general and in particular" (1)

The Sheikh says 'I have composed' (صنفت)⁽²⁾, and not 'I have compiled' (الفت), and this, comments Jildakī, is true because the work is original and includes a great deal which is completely new. It is also clear, continues Jildakī, that the author, like ṣāhib Al-Šudūr, considered theory to be very important and requisite for successful practice.

Vol. I., Book I.,

CHAPTER I : Explanation of the first section of the first part of Al-Muktasab, concerning the object of the Art of Alchemy.

Sheikh: "Know, may Allah have mercy on thee, that the materials used in the Art of Chemistry are of one species essentially. They are called the metallic minerals [Know, that the object of the Art of Alchemy is a single real species, called the metallic mineral] and subdivided into six sorts varying in form and in properties, but not immutable as are individual animals and plants. (3) They are gold, silver, copper, iron, lead and tin."

1. Tr., p.9; Es., Vol. I., p.8.

2. Pt., p.3 : صنفت

3. Tr., p.12; Vol.I., p.11.

To those who argue against the possibility of the transmutation of these six metallic forms and to those who believe them to be of different species, must be pointed out, says Jildakī, that the metallic minerals do not stop their development at a certain stage, as the individual animals and plants do. Moreover, there is a difference between common gold and silver and the gold and silver of the philosophers. Common gold is far from taking up the form of the Elixir, while the gold of the philosophers is suitable for that purpose. And again, common gold and silver are diseased, in contrast with the gold and silver of the philosophers which are not so affected. It is possible, continues Jildakī, to transform common silver into gold because it is only lacking in colour and in the strength of its parts. After overcoming these defects common silver becomes gold potentially and actually. The two coppers also are not fixed in their state of development and could be transformed by operation into silver. Let us not forget that the copper and iron of the philosophers, in comparison with common copper and iron, are at the height of their purity and cleanliness, says Jildakī. The same applies to the two leads.

Jābir has referred to what we have mentioned here, says Jildakī, in a great number of his books, specially in the

K. Ajsād al-Sab^o a (The Book of Seven Bodies) and K. al-Mawāzīn (The Books of Balances). Jābir argues that these bodies, when freed from their darkness and impurities, and mixed appropriately, some of them with others, in the smelting fire, will attain to the perfect state of silver and gold.

Sheikh: "Each of them is marked off from the others by accidental distinguishing properties, and it should be possible to effect the necessary removal of these properties, the specific nature remaining constant." (1)

These six forms, explains Jildakī, have fusion and malleability in common; while the time of fusion, and colour differentiate them one from another. The cause of difference is the infliction of accidental properties on them in the mines. These properties could be removed by operation: by washing off the dirt with the philosophers' soap, by the action of fire, and especially by the application of cleansing materials such as salts, boraces, and sharp waters.

Sheikh: "We say and maintain that two species of natural things which differ radically and essentially cannot be changed and converted one into the other by the Art, as for example, man and the horse. But these six bodies can be mutually converted: thus lead may be converted into silver, for if you place a pound of lead in the fire it rectifies it (and matures it) (2), and most of it is burnt away, leaving

1. Tr., p.12; Es., Vol.I., p.13.

2. The part in parenthesis does not appear in the End of the Search.

a small part as silver - about a quarter of a drachm of pure silver from every pound of lead.

"Now since it is possible for a part of the lead to be changed into silver, there is nothing to hinder the conversion of the whole. In the same way silver may be converted into gold, by (the refinement of) the smelting fire only. For it is tinctured by the fire and strengthened and transmuted and behaves like gold with the touchstone. Thus it is possible to effect a certain transmutation (since the specific nature is constant); but if silver differed from gold in species, it would not be possible to convert it into it, just as it is impossible to convert a horse into the human species by the Art, because they differ radically and essentially".(1)

The meaning of this quotation, says Jildakī, is obvious and does not require any interpretation.

Sheikh: "Another indication of that, and more complete than the first, is that in gold ores the gold is sometimes found perfect and at other times imperfect. The imperfect can be purified by the fire and separated into silver and gold. In the same way silver is found in its ores mixed with lead, and can be refined and separated from it. Now the cause of the occurrence of silver in gold ores is that the heat matures those parts of the ores which are near it and converts them into gold, if the ore is a gold one, or into silver if it is a silver ore. But it does not mature what is distant from it by reason of the low temperature and little heat." (2)

Now, says Jildakī, if we treat the perfect gold in the

1. Tr., p.12; Es., Vol.I., p.14.

2. Tr., p.12, 13 ; Es., Vol.I., pp.14-15.

fire, in the ordinary way which is known to all people, out of every twenty-four parts of it we get ten parts of imperfect gold. But a special treatment in the fire, known only to the philosophers, would improve the colour and make it appear purple. It is a fact of observation, continues Jildakī, that silver is found in gold ores, while gold does not occur in silver ores. Similarly lead is found in silver ores and not vice versa. The reason is that in gold ores heat has overcome the excess of cold in silver and an equilibrium is attained. As we go down the scale of metallic minerals, heat is gradually superseded by cold. Gold is in the middle, and metallic forms with an excess of heat occupy positions next to it on the other side of the scale.

Sheikh: "It appears, therefore, that these six metallic forms are all of one species, distinguished from one another only by differentiating accidental qualities; their extreme limit is reached when they become gold [their final cause is to become gold]. Now that which is free from any accidental quality is gold, while what possesses these becomes either silver or the two leads, if it has the quality of coldness, or copper or iron if it has the quality of hotness. And these (six) forms of a single species are similar merely to health and fever in man. When the fever is treated so that it departs and the man returns to freedom from disease, he regains the most perfect state of health."(1)

1. Tr., p.13; Es., Vol.I, p.15.

As we have mentioned before, says Jildakī, some of these six forms may be transformed to others by operation. An equilibrium, he continues, between heat and cold would produce gold. An excess of heat produces either copper or iron, while an excess of cold gives birth to silver or the two leads. All the imperfect forms strive to become gold and that is their final cause. The imperfect forms in comparison with the gold are like ailing men trying to attain to the state of health which is enjoyed by gold.

It is difficult to understand what Jildakī and other alchemists really meant by heat and cold. A purely Aristotelian interpretation of these terms would have very little practical significance, as the qualities of hotness, coldness, wetness, and dryness were only attributed, in this sense, to the inner parts of things, without having necessarily any outside manifestation. The alchemists, it is true, accepted the theory of Aristotle as their guiding principle. But their writings give, at times, the impression that they were actually talking about real heat and cold and had also some vague notion of the intensity of heat.

Perhaps a symbolic representation of the alchemists' theory of the formation of metallic minerals would make it more clear. Let us suppose that C_1 , C_2 , C_3 and H_1 , H_2 , H_3 represent respectively the degrees of cold and heat on two

opposite sides of the point E which is at equilibrium. At a point just to the right of C, or to the left of H, the formation of gold begins, but it is

$\overline{C_3 \quad C_2 \quad C_1 \quad E \quad H_1 \quad H_2 \quad H_3}$

at E that the perfect gold is produced. The gold generated on the left of E is diseased by the excess of cold and the one generated on the right of E suffers from the excess of heat. Silver starts to be formed at a point just to the right of C_2 and reaches to its perfect state at C_1 . Copper, on the other side of the scale, starts its formation at a point just to the left of H_2 and attains perfection at H_1 . So it is with the two leads and iron. Now the maximum cold in the gold mine lies somewhere between C_1 and C_2 , and the maximum heat somewhere between H_1 and H_2 . In the silver mine C_1 represents the minimum cold and the maximum falls between C_2 and C_3 . In the copper mine, on the other hand, H_1 represents the minimum heat and the maximum is between H_2 and H_3 . With this arrangement it will become impossible for gold to appear in either silver or copper ores, while the two latter may be contained in the gold ores.

Vol. 1, Book I,

CHAPTER II : Explanation of the second section of the first part of Al-Muktasab, concerning the possibility of removing accidental qualities present in the Species, so that it may return to its specific nature, by means of the Art.

Sheikh: "Know, that we began by saying that these six forms are all gold by species, and gold is their limit. Now that which is composed in the right proportion quantitatively, and in agreement therewith, in the right proportion qualitatively, and whose nature has reached its highest point, has become gold;"(1)

To explain this quotation, Jildakī attempts, first of all, to describe what is meant by quantity and quality.(2) Quantity is that which accepts division, he says. The following table shows the different kinds of quantity, as recognized by Jildakī.

Quantity كم	Continuous متصل	Amount مقدار	} ؟ تار tar	
		Time زمان	} ؟ غير تار	
	Separated منفصل	One dimension : line	} Magnitudes امتدادات	
		Two dimensions: surface		
Three dimensions: solid تحت				

The third dimension may be called height or depth according as one refers to ascent or descent. The quantities may be classified in another way:

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1. Tr., p.13; Es., Vol.I., p.17.
 2. Repetition of the same subject in different words is not a rare occurrence in Jildaki's explanations. I have tried as far as possible, to curtail the chain of unnecessary reiterations.

Quantity كم	Substantive بالذات	Magnitudes themselves; as distinct from things to which magnitudes could be applied. نفس الامتدادات
		Numbers اعداد
Quantity كم	Accidental بالعرض	Things in which the substantive quantity is present like: things to which numbers could be applied معدودات
		Or the opposite of the above like: شك . ?
		Things which their appearance requires the existence of quantity like: blackness.

Now what the Sheikh meant, says Jildakī, by "the right proportion quantitatively" was nothing other than an equilibrium in composition and weight, and contiguity of the parts which constitute the substance.

Quality, as Jildakī defines it, is accidental and does not accept division. The following table shows how he classified the qualities.

Quality	Things which are due to the active or passive exercise of the senses.
	Things which belong to the essence of soul like: mental faculties, understanding, and anger.
	Aptitude.
	Things which are exclusively attributed to quantities, both continuous and separated; trinity is an example of the first and marriage of the second.

By the "right proportion qualitatively", the Sheikh means, according to Jildakī, an equilibrium of heat, cold, hardness, softness, colour, taste, and smell.

Apart from having a right quantitative and qualitative proportion, there is another condition to be satisfied before the generation of gold is realized. This condition, says Jildakī, expressed by the Sheikh in a "terse and obscure" manner, is the action of nature, or the process of maturing, which raises the substance to its highest degree of perfection.

Sheikh: "while that in which the qualitative (composition) is varied comes forth from the ore in the state of imperfection [while that in which its hotness and coldness vary qualitatively appears in the ore in the state of imperfection.] " (1)

If the heat and cold are not balanced, explains Jildakī, the compound will be disintegrated by the contest between the two opposing forces, each trying to destroy the other and thus impeding the substance from attaining to its state of perfection.

Sheikh: "But the quantitative (composition) of these six individuals does not vary; for this

1. Tr., p.13; Es., Vol. I., p.20.

composition in them depends upon moistness and dryness, whereas the qualitative composition depends upon hotness and coldness." (1)

Moistness, explains Jildakī, emanates from vapour, and dryness from smoke. Vapour, on the other hand, emanates from water, and smoke from earth. Therefore the material existence of all bodies is due to earth and water. Nevertheless, continues Jildakī, the formation of bodies would not take place unless hotness and coldness have flowed into and penetrated all parts of moistness and dryness. Moistness and dryness have material existence and form the quantitative bases of bodies. Hotness and coldness are forces which have no material existence and are perceptible to the senses only through their effects. The latter two are the qualitative bases of bodies. The reason why a flame is perceptible to the eyes must be sought in the visibility of its intermediary, the fuel, from which it proceeds.

In the course of his explanation here, Jildakī contradicts his previous statement on the classification of quantity, by mentioning line, surface, and solid as examples of continuous quantities. Perhaps he differentiated between line and length, surface and area, solid and volume, but nevertheless he uses the same terms in both cases.

1. Tr., p.13; Es., Vol.I., p.20, 21.

Sheikh: "Now the moistness and dryness of which minerals are composed are nothing but watery steam and earthy smoke; if compounded together in right proportion, they give rise to these six metallic substances." (1)

The Sheikh, says Jildakī, refers here only to moistness and dryness as the necessary ingredients for the generation of metallic minerals. He did not mention hotness and coldness, because he intended to make his pronouncement on generation enigmatic and obscure. The wise man understands this and knows that it is impossible to generate anything in the three kingdoms except by the combination of the four natures. The fool, on the other hand, takes everything at its face value and is thus led astray. By the "right proportion" the Sheikh meant, according to Jildakī, a generative combination and not a corruptive one.

Sheikh: "If the dryness, that is, the smoke, is in too great proportion, then are formed brittle stones such as the marcasites, magnesia, tutias, and the stones related [akin] to the mineral substances from [like] kuhl (antimony) and zarnih (arsenic), etc." (2)

Stones, explains Jildakī, originate in the hollows of the earth from earthy oils, which in turn are produced by the

1. Tr., p.13, 14; Es., Vol. I., p.22.

2. Tr., p.14; Es., Vol. I., p.23.

action of natural heat upon water. Water, which is dilute and extinguishes fire, acquires opposite properties, becoming thick and inflammable, after it has been transformed into oil by the action of natural heat and the solution of earthy parts in it. Smoke is lighter than vapour,⁽¹⁾ because vapour is born from water and during the course of its ascent, when the heat subsides, it returns into the form of water again and starts descending. Smoke, which is produced by a more intense fire than that required for the formation of vapour, appears at the beginning as a light vapour, becoming infinitely lighter later on. Now, if there is an excess of dryness, the adhesive moistness,⁽²⁾ which holds the parts of the substance together, will be absorbed and destroyed, producing brittle stones and the like.

Sheikh: "If the moistness, that is, the steam, is in too great proportion, mercury, and nothing else, will result. This occurs only in particular districts of the earth in places which are very near to equilibrium, that is, equilibrium of climate [time] ⁽³⁾.

"Hence it has been established that the quantitative composition of these metallic

1. "Vapour is lighter than smoke", is actually what appears in the MS., but the explanation which follows the conclusion and the explicit statements to the contrary prove that a mistake has been made in writing. Es., Vol.I., p.24-5.

2. رطوبة الغروية

3. اعتدال الزمان : Jildakī takes زمان to mean time, though climate is its other meaning.

substances is constant; understand this, therefore, and know that the cause of the existence of gold is nothing but the equilibrium of the hotness, and that reason why the rest of the six substances fall short of being gold is excess either of hotness or of coldness."(1)

The "particular districts of the earth", explains Jildakār, are those where day and night are nearly equal in duration, and this is due to the low latitude of these places and their nearness to the equator. These districts constitute the first of the seven climes, which covers China, India, Arabia, Abyssinia, Egypt, the Land of Berbers, Spain, and all the seas lying in between. The position of the sun on the ecliptic requires that in this clime heat and cold alternate in periods of equal duration. As a result of this the vapours in the hollows of the earth are in a state of constant ascent and descent; neither heat nor cold last long enough to coagulate or to freeze them. Thus, when the moistness is always dominant, nothing but mercury is formed. Therefore, continues Jildakī, the quantitative composition of these metallic substances, which depends upon the passive parts, moistness and dryness, is constant; the active parts, hotness and coldness, being responsible for the variations.

Jābir, says Jildakī, refers to this in his K. al-Mawāzīn. It is mentioned there that anyone, who knows in what respects

1. Tr., p.14; Es., Vol.I., p.26, 28.

the quantity and quality in these six forms differ, would be able to restore the balance and transmute the defective forms into gold. The transmutation is carried out by following the steps of the Art and the use of smelting-fire, without, however, applying the Elixir or wasting a long time. Here Jildakī expresses his high opinion of Jābir. The latter, he says, has surpassed all in philosophy, his predecessors as well as those who came after him. The author of Al-Muktasab, says Jildakī, had also attained to an eminent position in philosophy, and his statements show that he had understood the meaning of Jābirian writings and tried to pass it on to us.

What the Sheikh meant by "excess either of hotness or of coldness", according to Jildakī, was the overwhelming abundance of one of them in the substance. A very small surplus of hotness is actually necessary, to act as fire during the time of maturing, until the generation of the substance is complete and the state of perfection is reached.

Sheikh: "Thus, the imperfection of silver is due to the excess of coldness. A proof of this is that silver is found in gold ore while gold is not found in silver ore, since the silver which is found in gold ore is lacking in hotness, which has prevented it from becoming gold. For a gold ore is hotter than a silver ore, and both gold and silver are found in it. The presence of silver is due to its distance in the ore from the heat, while the gold is formed by its nearness thereto."

"As for a silver ore, one does not find gold in it because it is colder than a gold ore, but it contains silver and lead. The occurrence of the silver is due to its approximation and closeness to the heat, while the presence of lead is due to its distance therefrom in the ore. Tin is often found in another ore of a different description."(1)

The meaning of this excerpt is obvious, says Jildakī, and as it has been expounded before there is no need to enlarge upon it.

Sheikh: "When scientists considered these six ductile mineral substances and found them to be of one species, part imperfect and part perfect, and when they found imperfect ones in the ores of the perfect, they knew that the difference between them was only qualitative; and they found that the accidental qualities which marked off one from another were only distinguishing unessential qualities which could be removed by means of a proper remedy.

"And they said: One of the two following things is necessary - (a) that we remove the accidental properties of these five substances by the fire; or (b) that we make a compound which if projected upon them will perfect in them that which is imperfect, and remove from them what is in excess of equilibrium or falls short thereof." (2)

Here Jildakī enters into a lengthy discussion concerning the possibility of transmutation. Philosophers of the

1. Tr., p.14; Es., Vol.I., p.29,30.

2. Tr., p.14, 15; Es., Vol.I., p.30, 45.

past and present, he says, have substantially conformed to the opinion of the Sheikh that the six metallic forms are essentially one in species. This, of course, is a convincing proof, continues Jildakī, as to the genuineness of the Art and the possibility of transmutation. Nevertheless, there have been philosophers who denied the sincerity of the claims of the alchemists. Abū^e Alī ibn Sīnā, in spite of his immense knowledge and high mental power, observes Jildakī, in his famous book al-Šifā (The Remedy), rejects the possibility of transmutation, saying that the six metallic forms are all different species of a single genus, that is, mineral. Similarly, the genus of plant, according to Avicenna, comprises many different species; so does the genus of animal. But just as it is impossible to change a horse into a dog, a bird into a horse, and a man into a bird, so it is impossible to change silver into gold, copper into silver, or lead into iron. The martyr Mu'ayyid al-Dīn al-Tuḡrā'ī in his book Haḡā'iq al-'ištihād (Truth of Evidence) repudiates the views of Avicenna, and by giving extensive quotations from al-Šifā shows that the latter was actually perplexed, not only with regard to transmutation, but also on the question of the life to come and the survival of the spirit after the annihilation of the body. Galen, perfect though he was, expressed views similar to those of Avicenna.

There have also been a great number of philosophers who forbade the practice of the Art altogether. Hunayn ibn 'Ishāq, goes on Jildaki, expressed the same opinion as Avicenna; Abū Muḥammad ibn Ḥazm thought that there was as much truth in the Art as in sorcery and fantasy. Ibn Taymiya, on the other hand, believed that colouring was possible, though the new colour faded completely away after seventy years.

Jildakī then proceeds to refute, on "logical and philosophical grounds", the arguments against the possibility of transmutation. But, as we will see, his reasoning is at times permeated with fallacy and leaves much to be desired. We do not contend, says Jildakī, that even transubstantiation of different species into one another is impossible, though what the alchemists actually do is the perfection of the imperfect forms of a single species. There are many examples in mineral, vegetable, and animal kingdoms which could serve to prove this point.

In the vegetable kingdom combination, transformation, and transubstantiation is possible, as it is mentioned in the books on agriculture and it could be verified by observation. Pistachio could be produced by combining almond and turpentine; different kinds of grape with various colours, which grow in the vineyard, have the same origin; different fruits may be

obtained from the same tree; and many variations of fruits with different smells, colours, and tastes would result by employing methods of transformation. The reason for all this is that the plant is capable of growth and transformation by virtue of its pervasive soul and its readiness for combination. This combination is of the second order, in contrast with the generation of scorpions from putrid basil (a fragrant kind of herb) and worms from manure, etc.

As to the animal kingdom, here the combination is of the first and highest order. Among the animals, there are those with fixed forms admitting no alterations, like man and horse. On the other hand, there are animals which undergo transformation. The silk-worm is transformed into a winged animal, the gnat is born from the worm, and the snake is generated from hair, etc. So we see, observes Jildakī, that there are species in the vegetable and animal kingdoms which go on changing their forms until they reach their final predestined state. Now, just as transformation is possible in vegetables and animals, so it is with minerals. The possibility of transformation is due to the fact that a species, no matter to which kingdom it belongs, has not reached its desired and final state.

If the six metallic minerals, argues Jildakī, represented different species, like man and the horse, then they would

have perhaps preserved their form. But, as a matter of fact, they are different kinds of the same species and their differences, as we have seen before, are due to accidental qualities.

All the propositions in science, according to Jildakī, may be divided into three categories: necessary, conditional, and impossible. 'Fire is hot and dry' is an example of the first category, 'man writes' of the second, and 'man flies' of the third. Any conditional proposition, such as 'the Art is possible', may become either necessary or impossible, depending on whether its predicate, in this case 'is possible', be true or false. The proposition which asserts the possibility of the Art could not become impossible, because, in the first place, its impossibility is not, as when we say 'fire is cold', obvious. Moreover, as we mentioned before, anything which is not in a balanced state is bound to undergo transformation, because of the contest between the opposing forces inside it. Therefore, the stability of a substance which has not reached equilibrium is impossible or, in effect, the possibility of the Art becomes a necessity.

But it must be understood, says Jildakī, that transformation may be corruptive and generative at the same time. For example, in the treatment of the five imperfect metallic

forms with fire, only a very small portion attains to the perfect state and the rest is destroyed.

Avicenna, in one of his books, says Jildakī, while denying the possibility of transmutation, accepted the change of colour. He recognized two kinds of dyes in alchemy, white and red. Accordingly, when copper was transmuted into silver and silver into gold, he thought that the products were nothing more than dyed copper and silver. The recipe which he gave for the white dye comprised arsenic, mercury and silver. As to the red dye, it was prepared from sulphur, mercury, gold and sal ammoniac, or it was derived from vegetable and animal substances. Avicenna actually describes in detail the ways and means employed in the preparation of the dyes on the authority of his predecessors. Hunayn b. 'Ishāq agreed with Avicenna and a great number of other scholars subscribed to the same opinion.

We do not entertain the view, says Jildakī, that transformation is possible in every case. Existencies are divided into two classes: simple substances and compounds. Simple substances do not transform except by combination, that is to say, combination is their only transformation. Compounds are divided into three groups as follows:

(a) Those which have a balanced and strong constitution like gold and ruby. They preserve their form for ever,

because they have already reached their final and perfect state.

(b) Those which have a balanced and porous constitution. All healthy plants and animals are included in this group. They grow and become more and more fresh as moisture and heat pervade their interstices in an increasing degree. The culminating stage of this process is represented by a man at the summit of his strength, and by a fully grown plant. But later the process is reversed. Dryness and cold gradually supersede moisture and heat until they come completely dominant, and so the end comes.

(c) Those with an aberrant (and porous in the case of vegetable and animal) constitution. This group consists of all the defective and diseased forms of the mineral, vegetable and animal kingdoms. There are two distinct types in this group. First, there are those which have completely lost their coherence and compactness. In minerals, this happens when the adhesive moisture is totally annihilated by accidental qualities. A dried-up tree and a man whose governing organs have become defective are examples of this type. There are no possible treatments to cure diseased species of the first type. The second type in this group comprises the diseased species which are amenable to treatment. The state of health and perfection could be

restored to them by appropriate operations. This is what a physician, a veterinary surgeon, an expert farmer, or an alchemist does.

Now let us examine, says Jildakī, the idea of colouring advocated by Avicenna, Hunayn, and others. The Art is either true, he goes on, or false, and there is no other possibility. If it is true, our thesis is established; if it is false, then how are the opponents of alchemy going to interpret the change of colours, which they accept as a fact? They have either observed the change of colours themselves, or they are relying on the statements of the alchemists. In the latter case, the possibility of the Art is proved, because it is a contradiction to accept the word of the alchemists in one instance and to reject it in another. But if they have carried out the experiment themselves, they have either followed the instructions of the alchemists or performed the operation on their own initiative. In the former case they are again contradicting themselves by accepting only part of the whole truth. Finally, if they have effected the change of colour strictly on their own, it is either genuine or spurious. If it is genuine, the alchemists have been proved right. As to its being spurious, there is no reason, as we shall see, to support it.

The main point in Jildakī's argument is this, that

"since part of what the philosophers (Alchemists) have said is true, therefore, it is permissible to accept all that they said as true."⁽¹⁾

There are two conditions which must be met before the operation of dyeing or colouring is attempted. Firstly, the dye must have the right combination and perfect constitution. Secondly, the substance upon which the particular dye is projected must be capable of absorbing it without any difficulty. Now it is impossible, says Jildakī, to doubt the genuineness of colouring if the two conditions have been observed. Any failure in colouring necessarily implies an error in fulfilling the two conditions. Therefore, when copper takes up the permanent and genuine colour of silver, and silver that of gold, it is not appropriate to speak of coloured copper and silver. Coloured copper, as the opponents of alchemy would call it, is potentially and actually silver. Similarly, coloured silver is nothing but gold.

The trouble with the opponents of the Art is, says Jildakī, that they have not grasped the inner meaning of what they have read on alchemy, and have accordingly confined themselves to superficiality. The statement of Ibn Hazm, in which he compared the Art to sorcery, could be attributed only to sarcasm and ignorance. It is also obvious that,

1. Es., Vol.I., p.41.

when Ibn Taymiya expressed the opinion that the colour would fade away in seventy years, he based his judgment, not on actual observation, but on artifices invented by his own imagination.

Now that we have established the possibility of the Art, continues Jildakī, we return to the statement of the Sheikh where he says "they found imperfect ones in the ores of the perfect." This statement is verified by operation. The gold which comes from the mine is partly base and partly perfect; and on adding the 'solvent water' to it the perfect part which is pure gold remains unaffected, while the base part, that is, silver, dissolves in the water.⁽¹⁾ This description of Jildakī, I think, leaves us in no doubt that by 'solvent water', he meant nitric acid. The treatment of the five imperfect metallic forms is carried out, he goes on, either by fire alone or by the application of a compound which is specially prepared for the purpose. The action of fire is to unite the likes and separate the unlikes. The projected compound, on the other hand, elevates the imperfect parts of the substance to the perfect state and destroys the redundant parts.

Sheikh: "Now if we use fire alone, it must be either violent or gentle, and the time each of these takes must be either long or short.

1. Ibid., p.46.

"We will explain the action of the fire, in its different divisions, upon each of these substances less perfect than gold. And we say that when silver is placed in a light fire, no success is acquired by a short action, but a long period is necessary - even to years: a thing which human nature makes difficult.

"So there is no benefit at all to the silver by a long action nor by a short one, for a long action is difficult and life is too short for it, while a short action does not succeed. Moreover, when silver is placed in a violent fire, if the time is shorter than necessary, there is no success, while if long, it is certainly tinctured in the fire and is strengthened, but only after removal of the greater part, and so small a part is left that it was not worth transmuting it into gold on account of the loss incurred and the outlay required. Thus there is no advantage in converting silver into gold by fire alone, although (in the possibility of this transformation) we have found a conclusive proof (of the soundness of our argument)."(1)

Know, explains Jildakī, that the action of nature on substances is in accordance with their capabilities. Plants and animals, owing to their existence on the surface of the earth and their porous constitution, are better disposed to be affected by the active forces of Nature, and are, therefore, quick in generation and corruption. Minerals, on the other hand, because of their compact constitution and the fact that they are hidden in the depths of the earth, may remain unaffected for years, perhaps centuries, on end. Here the Art comes to our help to speed up the slow process

1. Tr., p.15; Es., Vol.I., p.47.

of transformation in minerals. And, as the philosophers discovered that heat is the most active force in Nature, it was only natural to suggest fire as a means for overcoming the slowness of transformation.

The rest of Jildakī's explanation of the above quotation is no more than the repetition of what the Sheikh has already said.

Sheikh: "As for the action of fire upon the two coppers, the fire must be either violent or gentle, and employed either for a long time or a short one. It was, indeed, known that the two coppers are held back from the state of being gold only by their excessive hotness; now the fire strengthens its like and weakens its opposite, so that an increase in hotness occurs whether the fire be gentle or violent, long in action or short. They both are crumbled and converted into a useless powder, and their specific nature is lost, so that no benefit whatever is derived. Thus vain is the use of fire alone with the coppers also; the same is true for the two leads. For each sort of fire must act either by a long action or by a short. Now a gentle fire will have no action except by a long exposure; however, a lengthy operation is difficult for the operator, and life is too short, while a short exposure is useless since it has no action at all. Similarly, a violent fire, whether the time be long or short, burns it and drives away its moistness, and so no benefit whatever is derived, since the composition of lead is not in proper equilibrium."(1)

1. Tr., pp. 15, 16; Es., Vol. I., pp. 49, 50.

The two coppers do not possess, says Jildakī, the same amount of heat; and for further information in this respect one must consult the Kutub al-Mawāzīn of Jābir. The excessive amount of heat in the two coppers destroys part of their moisture and thus increases their dryness. Nevertheless, copper possesses more moisture than iron, and that is why it melts easier than the latter. But, as the Sheikh has said, application of fire to the two coppers would make them lose their adhesive moisture and would convert them into useless powders.

As to the two leads, though suffering from excess of cold, the only treatment with fire which results in success is the gentle one with long duration. And as a long duration is not in accordance with the shortness of human life, so the application of fire alone is completely useless.

Sheikh: "When this, that is, the action of fire, made itself clear to them, necessity drove them to make a compound from a single drug, or from drugs either differing in species or differing in form, [or from two drugs differing in species, nay, differing in form] but nevertheless included in a single species essentially, though not relatively [but nevertheless included in a single real species and not in a relative one] .(1)

I. The rest of this quotation, as it appears in the End of the Search, is at complete verbal variance with the printed text of Al - Muktasab. But as there are no fundamental differences with regard to the meaning, and moreover the printed text in this particular case is more orderly, I have reproduced the translation given by Dr. Holmyard without alteration.

And they made two Elixirs, one of them for whiteness and the other for redness, both fusible, miscible, soluble, permeating, stable and assimilable. For if there be no fusion there can be no mixing, and if there be no mixing there can be no assimilation, and if there be no assimilation there can be no solution, and if there be no solution there can be no permeation, and if there be no permeation there can be no stability in the fire. And if one of these qualities is lacking the combination is ruined, and if the combination is ruined then the Art is vain."⁽¹⁾

When the Sheikh says "from a single drug, or from two drugs", he does not mean, according to Jildakī, that the Elixir may be prepared either from one or from two drugs. He has made his statement intentionally obscure in order to confuse the fool. By 'single drug' he implied the oneness of the material, that is, the stone, employed in the preparation of the Elixir. By 'two drugs' he meant the masculine and feminine components of the material. By 'differing in species' he meant the difference in nature between the masculine component, which is hot and dry, and the feminine component, which is cold and wet. The phrase 'differing in form' indicates that the raw material of the Elixir is chosen from among the elements, as each of the latter has its own peculiar natural form according to its

1. Tr., p.16; Es., Vol. I., p.51.

being masculine or feminine.

To explain what the Sheikh meant by 'real' and 'relative' species, Jildakī discusses the age-old problem of the relation of species to their common genus. The 'real species', according to Jildaki, are those, the individual members of which have the same essence, and, besides, are not attached to any particular genus. A 'relative species', on the other hand, is always included in a genus, for example 'animal' is one of the 'growing bodies' and that in turn is classified under 'bodies' in general.

It is, I think, appropriate to mention here that the limitation of the word species to one particular level, usually the lowest in the classification, was a matter of slow development in scientific terminology.

Jildakī further observes that the distinction between the two real and relative species is not confined to certain parts of them, but that all the corresponding parts differ in one respect or another; for a real species may exist without being in any sense connected to a relative one, or vice versa.

Sheikh: "It is necessary that one of the Elixirs should be hot and red, in order that it may remove the quality of coldness and may tincture the substance with its colour, red; and the second cold and white, to remove the quality of hotness and to tincture the substance with its

colour, white. In this way, upon whatever of these (metallic) forms it is projected, it dissolves in [it plunges into] it with effervescence, and will be an aid to the fire in shortening the operation. It will be such a substance that it removes the accidental qualities, and at the same time preserves the (metallic) form and the equilibrium of its moistness with its dryness."(1)

When the Elixir is projected upon metallic minerals, it plunges into their depths by its heaviness, says Jildakī, and starts effervescing and hissing, though no smoke is evolved.

Sheikh: "Now to whatever of these (metallic) forms is cold, is added the hot Elkir, and it heats it and tinctures it red; while to those which are hot with a heat in excess of equilibrium is added the white Elixir, and it cools them and tinctures them white, and gives equilibrium to their constitution which was disordered.
"For that which renders necessary the heating of these (metallic) forms in the refining fire is only the qualitative variation; thus there occur among them the soft and the hard and the heavy and the light." (2)

Here Jildakī praises the Sheikh saying that he has vied with Socrates in "laconicism, eloquence and catechism". The rest of Jildakī's interpretation of the above passage

1. Tr., p.16; Es., Vol. I., p.54.

2. Tr., p.16; Es., Vol. I., p.55, 56.

is nothing more than a restatement of what the Sheikh said, except that he attributes softness and lightness to heat, and hardness and heaviness to cold.

Sheikh: "As for silver, the Elixir of Redness when projected upon it fixes it not by its heaviness but by its stability and ready fusibility and by protecting it from the fire. Thus the fire is able to accelerate the action and completes the maturing of the silver and fixes it and tinctures it, and it becomes gold when the lightness and whiteness have disappeared from it. For the whiteness in silver is the necessary consequence of the coldness and small degree of maturing, and when the cause disappears there disappears with it the effect. Understand that, therefore, for it is one of the foundations of this Art, and the Sages one and all were very jealous of it even with their sons, and more so with the rest of men."(1)

Silver, comments Jildakī, is the purest of the five imperfect metallic forms and therefore nearest of them all to gold. What it lacks is colour and firmness. (2) The Elixir is projected, accompanied by the action of fire, in order to overcome these two defects. But it must be understood that the increase in the firmness of silver is not due to the heaviness of the Elixir. For two things are possible; either the addition of the Elixir increases the weight of the

1. Tr., p. 16, 17; Es., Vol.I., p.57, 58.

2. تلز : By firmness Jildakī, as the rest of his account shows, implied, I think, density though perhaps not invariably.

substance upon which it is projected or it does not. If it does, either there is a proportional increase in volume or there is not. If there is a proportional increase in volume, then the silver would not improve in firmness. On the other hand, an increase in weight which is not accompanied by a proportional increase in volume would improve the firmness of silver.

Now, this argument would have been true if the Elixir was just an ordinary 'body', fusible or else. But, as all the Sages have agreed, the Elixir, though it has a bodily appearance, has a spiritual action. Therefore, continues Jildakī, the attribution of the silver's improvement in firmness to the weight of the Elixir is completely irrelevant. In short, if we employ the modern terminology, the action of the Elixir was very similar to that of a catalyst.

So the Sheikh was right, says Jildakī, in his assertion that the fixation of silver was due only to the stability and ready fusibility of the Elixir, and also to its protecting the silver from the fire. Jildakī then enlarges upon the protective action of the Elixir against the fire. The Elixir, he says, penetrates the substance thoroughly, and by its 'uninflammable, adhesive oiliness'⁽¹⁾ protects the particles of the latter from the destructive action of the

1. دهانة الخروبه الجير الحترقة

fire. Thus the parts or particles of the substance, in presence of the fire, find the opportunity of uniting their inner defective heat with the heat provided by the Elixir; and this is what is meant when it is said 'fire unites the likes'. And just when the maturing process is complete, the red colour appears and silver turns potentially and actually into gold.

Sheikh: "As for the two leads, that which prevents them from being silver is only their coldness, which is in excess of that of silver. Their constitution is rendered imperfect by the paucity of their hotness and maturing.

"And since it is known that the Elixir of Whiteness is hotter than the two leads, in the same way that the hotness of silver is greater than that of the two leads, then the Elixir of Whiteness may be projected upon the two leads and will increase them in hotness and cohesion until it transforms them into the just proportion of silver and its hotness, which falls short of gold and goes beyond the two leads.

"Thus the Elixir of silver is not excessively [absolutely] cold, and the Elixir of gold is not excessively [absolutely] hot." (1)

The hotness of silver, says Jildakī, is less than that of gold but more than that of the two leads. And there is no doubt that the Elixir of Whiteness is of the same stock as silver, and were it not for the tenderness and spirituality of the former, they would have been exactly the same. A

1. Tr., p.17; Es., Vol.I., p.61, 62.

similar relationship exists between gold and the Elixir of Redness.

Now the reason why we treat the two leads, which are suffering from excessive coldness, with the Elixir of Whiteness, which is cold itself, is that the latter is cold only in comparison with the Elixir of Redness but it is hot with regard to the two leads. I have mentioned, adds Jildakī, in my book Bugyat al-Habir that the Elixir of Whiteness in order to be effective requires to be invested with a special motion appropriate to the Art. I shall clarify this point, he goes on, in the present book when we come to the chapter on the projection of the Elixir.

One important point to note here, I think, is that both Al - 'Irāqī and Jildakī understood that coldness and hotness are not two completely distinct qualities. A substance is said to be cold with regard to another, and it is said at the same time to be hot with regard to the third.

Sheikh: "The two coppers, as far as concerns their relationship to gold and silver, are hotter and drier than the latter. Now things will strengthen their like and weaken their opposite, so that if the Elixir of Redness is projected upon the two coppers, it increases them in heat and dryness, and converts them into powders from which no advantage whatever can be gained. It is therefore necessary that the Elixir of silver should first be projected upon them, to moisten them and cool them and convert them into silver; if the Elixir of gold is then projected upon them

it will convert them into gold, after their transformation into silver. So understand that and think thereon." (1)

After repeating the statement of the Sheikh in different words, Jildakī emphasizes again that the projection of the Elixir alone would not produce the desired result, unless other measures are taken into consideration, he will discuss these measures in the chapter on the projection of the Elixir.

Sheikh: "And know that mercury in comparison with the two leads is cold; if the White Elixir is projected upon it, it coagulates it not as a body but as Elixir, and the same happens when the Red Elixir is projected upon it. This is for the following reason, namely that natural things do not reach their limit of perfection except by natural degrees. A cotton-seed, for example, cannot immediately become a garment. Its seed-form must first pass away, then it clothes itself in the form of a plant, and, after decay and change, takes many forms. Then it casts off the form of a plant and takes the form of a thread; then it casts off the form of a thread and takes the form of a piece of cloth; then it casts off the form of a piece of cloth and becomes a garment.

"In the same way, these bodies change at first only into the form of silver, and then into gold; and this follows uniformity of specific nature, for what is right for any one of all these forms is right for the others, since they are all varieties of the metallic mineral." (2)

1. Tr., p.17; Es., Vol.I., p.63.

2. Tr., pp.17, 18; Es., Vol. I., pp.65, 66.

Mercury does not change into silver or gold, explains Jildakī, because it is not one of the metallic minerals. The Elixir is strong and active by nature. Mercury, on the other hand, is essentially passive and presents no hindrance to the action of the Elixir. The latter, confronted with no resistance on the part of mercury, transforms it into its own essence. There are no intermediate stages through which mercury should pass before being transformed into the Elixir. So, each one of the two Elixirs changes mercury into its own form. Moreover, if mercury is acted upon first by the Elixir of Whiteness and then by the Elixir of Redness, it will change first into the former and subsequently into the latter.

But the Elixir itself, continues Jildakī, is produced from the raw material, the 'stone', after passing gradually through many different stages. The 'stone' is potentially elixir but not actually. By operation it is consecutively transformed into mineral, vegetable, animal, and human grades before becoming actually elixir. These grades are in a sense similar to the stages through which the cotton-seed passes before becoming a garment.

Sheikh: "As for mercury, this is related to them in moistness as is marcasite in dryness, and when the Elixir is projected upon either of them, it acts according to their nature. Thus, when the

Elixir is projected upon mercury it coagulates it not to a hard mineral but to an elixir in the form of powder, such that when it is projected upon a mineral form of an imperfect degree it makes it reach perfection of the species. And when the first Elixir is projected upon marcasite and the like it increases their dryness and crumbliness and so no benefit accrues to them all.

"Understand, therefore, the hidden things of the secrets of this Art, and thou wilt attain to a high degree, if Allah, the Most Exalted, will."(1)

When the Sheikh says 'this is related to them', by the last term he implies, according to Jildakī, the metallic minerals. Now, moistness is the cause of generation and combination, while dryness is the cause of corruption and disintegration. Mercury, when the Elixir is projected upon it, gets rid of its excessive moistness which is then balanced by the dryness of the latter. Marcasite, being itself excessively dry, is reduced to a useless powder, when the Elixir with its drying effect is projected upon it. By the 'first Elixir' the Sheikh meant, says Jildakī, the one which is projected upon mercury and not the other which results from such a projection.

Sheikh: "And know, may Allah the Exalted have mercy upon thee, that I intended, in composing [compiling] this prologue in two sections, only to guide aright him who looketh into this book

1. Tr., p.18; Es., Vol.I.,pp.68, 69.

of mine, For every art must have given materials upon which it is based, and we found that materials of this Art are these substances, 7 vulgarly, but 6 more exactly, - nay, 5 rather, since gold, even if it is of their number, is perfect, and the Art of Chemistry was founded only to raise the remaining substances to its level. I have treated the whole matter thoroughly, in order that the reader may easily enter their town and speak their language and know their Art and copy their royal and philosophical procedure. And from Allah - may He be exalted and magnified! - I ask aid and guidance and right direction to the Path, by His grace and munificence. Verily, He is powerful over whatever He willeth!" (1)

The Sheikh, observes Jildakī, compiled the prologue, as he himself would agree, but he composed the book itself. In the prologue he presents in an abridged form what the Sages thought and taught before him. But in the main part of the book the Sheikh discusses, according to Jildakī, new problems, and renders original contribution to the Art of Chemistry. And when the Sheikh says that "every art must have given materials upon which it is based", he is referring actually to the subjects discussed in the prologue. By the 'seven' substances he means gold, silver, iron, lead, tin, and mercury. The number is reduced to six when mercury is left out, and it is further reduced to five when gold, on account of its perfection, is excluded from among the

1.Tr., pp. 18, 19; Es., Vol.I., p.70.

imperfect forms. "And I have treated the whole matter thoroughly, in order that the reader may easily enter their town and speak their language and know their Art", says the Sheikh, referring to the philosophers, whose town, according to Jildakī, is philosophy, whose language consists of enigmas, and whose Art is that excellent product, the possessors of which have attained to the eternal kingdom. The dwellers of that town speak that language, practise that Art, engage in royal politics and philosophical studies, even if all men deviate from the right course and go astray.

I swear by my religion, Jildakī goes on, that anyone who occupies such a high and lofty position in this world will be prosperous in the next. For one who knows the secrets of this Art is a firm believer in the life to come; he is certain that the soul survives the death of the body, and that it transmigrates to a new body after the disintegration of the old one. And indeed the ultimate purpose of this philosophy is to prove that the Creator of all things, the source of knowledge and wisdom, is One and has no partners.

Vol. I., Book I,

CHAPTER III: Explanation of the third section of the first part of Al-Muktasab, concerning the prime substance from which the Elixir is formed.

Sheikh: "Know that the Elixir is fusible, miscible, tinctorial, stable, permanent and perfecting; and if one of these properties be lacking its work is vain, as has been explained before. For if it be not fusible, it will not be miscible, and if it be not miscible, it will not tincture, and if it do not tincture it will not be stable, and if it be not stable it will not be permanent, and if it be not permanent, it will not complete, and if it do not complete, it will not perfect."⁽¹⁾

The Sheikh, says Jildakī, dealt with the properties of the Elixir in the previous section of his book. In the present section, he takes up the same subject in order to present a connected account. In the previous section he thought the Elixir must be fusible, miscible, soluble, permeating, stable and assimilable. Now, he leaves out, comments Jildakī, the two adjectives soluble and permeating, and adds another one, perfecting, in their stead. (He actually adds two: permanent and perfecting.)

As to the statement of the Sheikh: "if it be not fusible, it will not be miscible," Jildakī regards it to be indisputable, but he remarks that not every fusible thing, glass for example, is necessarily miscible. In other words, fusibility is necessary but it is not sufficient. And again, when the Sheikh says: "if it be not miscible, it will not

1. Tr., p.19; Es., Vol.I., p.73.

tincture," it must not be understood that miscibility is by itself a sufficient cause of tincture; not everything which is miscible does necessarily tincture. But the Sheikh is wrong, says Jildakī, in mentioning tincture as the cause of stability. Stability is due to the right combination and right constitution of the Elixir, and it has nothing to do with the tinctorial power of the Elixir. Most probably this mistake, Jildakī wishes us to believe, has been committed by the copyist. The Sheikh is right, however, when he says: "if it be not stable, it will not be permanent," because anything which is not stable could not possibly be permanent.

It would have been better, therefore, according to Jildakī, if the Sheikh had said: "If it be not soluble, it will not be miscible, and if it be not miscible, it will not be stable, and if it be not stable, it will not tincture, and if it do not tincture, it will not complete, and if it do not complete, it will not perfect." Perhaps, says Jildakī, the Sheikh actually said this and the error crept in later on. The statement of the Sheikh, that "if it do not complete, it will not perfect," refers to the completing action of the Elixir, without which the imperfect forms would not reach to the perfect state; and to this Ṣāhib al-Ṣudūr refers in one of his poems.

Jildakī quotes numerous and extensive pieces of the poems of Ṣāhib al-Ṣudūr on alchemy in different parts of his book. The language of alchemy in its prose form is obscure enough, but when it appears in poetry, it becomes much more difficult to understand, especially the poems of Ṣāhib al-Ṣudūr, as Jildakī himself pointed out, which are extremely enigmatic and "need years of close study."⁽¹⁾⁽²⁾

The poem of Ṣāhib al-Ṣudūr, which is invoked in this occasion, begins by describing the properties of the Elixir and the marvels of the Art, mostly by analogy, without, however, mentioning them by name. The revelation comes just before the poem ends, and the poet expresses the view that the Art and the Elixir were inherited from Noah and Enoch.⁽³⁾

Sheikh: "Now these properties must either be present in the stone in a natural state, or after operation, (or else present in it both before and after operation).⁽⁴⁾ If they are present in the prime matter before the operation,

1. See p. 240 below.

2. Holmyard, Introduction to the Translation of Al-Muktasab, p. 3.

3. Es., Vol. I., p. 75 :

4. The part in parentheses appears in the Pt. but not in the Es.

فهد أهوالتدبير الحجر الذي ورثناه ادريسا و نوحا فاننا

then this matter is an Elixir. If this is so, then it must be in the form either of a single natural species [of a conjectural simple substance],⁽¹⁾ or of a compound. So we searched among the elementary ores [among the simple, mineral substances], since other than these could have no action in this sense, and we found that when sulphur is projected upon silver it blackens the latter and crumbles it; the two arsenics acted in a similar way. But sulphur does not blacken except by the violence of its hotness and dryness and power of assimilation, and in addition to that, we found that it was transformed and readily changed in our smelting-fire. So we abandoned it and came to the marcasites and tutias and magnesias, and found that they indeed had an action, but an action which would corrupt the species; except the tutias. These will turn copper yellow with the yellowness of gold, but only as silver acts upon copper, and they do [and this does] not make it complete, that is, transform it into a gold which will not rust with those things which rust copper, such as vinegar and acids, and which is not affected by the process of removing lead in refinement. The same is true of the rest, meaning the crumbly stones."⁽²⁾

Jildakī begins his explanation here, by giving an account of the origins and the transmission of alchemy. The Art of Chemistry is either based on secular knowledge or on heavenly revelations. Jildakī claims that he found it to be based on both; it is partly secular and partly spiritual. The spiritual part began with Adam and he passed it on to his son Seth; then it reached to Enoch who was called 'Hermes

1. Pt. : بسبط طبيعى ; Es. : بسبط ظنى .

2. Tr., p.19; Es., Vol.I., pp.76, 94.

of Hermes', then it reached through the descendants of the latter to Noah, then through the descendants of the latter to Abraham, then through the descendants of the latter to Moses, then through other people to Jesus, then through other people to Muhammad, who, in turn, passed it on to his son-in-law, 'Alī. Ja'far al-Ṣādiq, the sixth Imam, inherited it from the latter and transmitted it to his great pupil Jābir b. Ḥayyān al-Ṣūfī. After Jābir, other people followed the pursuit of the Art up to the present time. So, the Art has been transmitted from nation to nation and from one religious sect to another; it has been expressed in various languages and in different words, and yet all these versions, as the initiates would know, point to similar conclusions. The opponents may say that, although Muhammad, the last prophet, has been extensively quoted, there is nothing in his statements to indicate his familiarity with the Art. If the evidence in the case of Muhammad is so negligible, then how are we going to prove the familiarity of the remote prophets, such as Noah, with the Art? There is no doubt, answers Jildakī, that God made Muhammad familiar with all branches of knowledge, including the Art, and there are a number of verses in the Koran which may serve to prove this, provided that one knows what is their correct interpretation. Moreover, it is common knowledge that Muhammad actually discussed the problems of the secret

Art with a selected group of his disciples, as the narrations of Abū Hurayrah⁽¹⁾ show. Maslima al-Majrītī describes in his K. al-Aḥjār (The Book of Stones) the alchemical statements attributed to 'Alī. Al-Ṭuḡrā'ī mentions in his writings what has been quoted from the prophets on alchemy. Jābir refers in many chapters of his numerous books to his teacher and inspirer, Ja^efar al-Ṣādiq. All this proves, says Jildakī, the authenticity of the tradition. Both the spiritual and secular components of the Art have been always expressed and taught in obscure and enigmatic terms. Anyone who dares to break the rules of secrecy will be severely punished by God. The reason for the rigid observance of secrecy is that the universal divulgence of the Art would entail the destruction of society. Gold and silver are means of exchange, and if they become plentiful by the access of all people to the Art, a substitute would have to be found to take their place. But as it is impossible to find anything nobler than gold and silver, in which men could put their trust, society, argues Jildakī, would then collapse.

Returning to the above-mentioned statement of the Sheikh, where he says "these properties must either be

1. One of the most constant attendants of Muḥammad, who from his peculiar intimacy has related more traditions of the sayings and doings of the Prophet than any other individual.

present in the stone in a natural state, or after operation," Jildakī comments on the method employed by the former in the presentation of the different possible solutions of an alchemical problem. The Sheikh usually mentions two possible cases, and this implies, according to Jildakī, that, if one of them is true, the other is false. Sometimes it is easy to distinguish the true case from the false one. At other times it is rather difficult, and there are many things to be taken into consideration before a right judgment can be given; one such example is to establish whether the above-mentioned properties are present in the stone in its natural state, or after operation. The alchemists, having found out, after careful considerations, that the imperfect metallic forms are capable of being transformed by operation into gold, began to inquire whether there are one, two, or more substances in the mineral, vegetable and animal kingdoms, which possess the properties of the stone, either potentially or actually. And they said that if they found a substance, or an essence, which was in actual possession of these properties, they had then reached their goal, that is, the acquisition of the Elixir. But if they found a substance which was in actual possession of only part of these properties, they would then consider whether it did not possess the rest of the properties

potentially, so that they could make them actual by the application of the Art.

Jābir, continues Jildakī, has mentioned in his commentary on the K. al-Rahma (Book of Mercy) that God possibly created an ore for the Elixir but did not let anyone have access to it; "this is not impossible, and his word is accepted on everything."

By 'conjectural simple substance' the Sheikh meant, according to Jildakī, a substance which is capable of being produced and is one in form and matter; and, as there is no definite reason to believe that it already exists, so it is called conjectural. It must not be mistaken with the four primary principles⁽¹⁾ which could not be obtained in isolation, and are only dealt with in relation to their presence in compounds. All the material substances are either simple or compound, and the simplest kind of them are the four elements.⁽²⁾ But we are not endowed by God, argues Jildakī, with the power of creating anything we desire from the four elements. We can only produce things by obtaining the germs from which they develop - generation of the plant requires seed, and that of an animal requires sperm.

1. Hot, cold, wet, and dry.

2. Fire, Air, Water, and Earth.

"So we searched among the simple mineral substances, since other than these could have no action", the Sheikh wrote; and by 'other than these' he meant, according to Jildakī, simple vegetable and simple animal substances, which, because of their porous constitution, are vulnerable to the attack of the natural forces, and, therefore, are not permanent. Jildakī here quotes a poem of Ṣāhib al-Ṣudūr. The latter expresses the opinion that, although it is possible to extract from vegetable and animal substances a dye which is potentially capable of tincturing the silver, it is extremely difficult to make this potentiality develop into actuality. Moreover, vegetable and animal extracts, because of their lightness, do not possess, as a rule, the necessary power of penetration and assimilation. And know, says Jildakī, that the properties of the Elixir are potentially present in all substances. Water, oil, tincture, and earth form the basic constituents of all substances. Tincture has the nature of fire, oil that of air, water that of water, and earth that of earth.⁽¹⁾ But there is a difference between, for example, mineral water on the one

1. Jildakī apparently makes distinction between the ordinary water and the water element, and also between ordinary earth and the earth element.

hand, and vegetable or animal water on the other. The former is heavy and is suitable for generation, while the latter has a boracic nature and, be it heavy or light, dries up by the heat of the sun, and is not, therefore, suitable for generation. Similarly, mineral oil is unflammable, whereas vegetable or animal oil is inflammable; mineral tincture is penetrative and quickly transforms an imperfect natural form into a perfect one, while vegetable or animal tincture is slow and does not last long. Nevertheless, as Jābir has said, it is possible, though very difficult, to generate the Elixir from vegetable and animal substances. The fact that vegetable and animal substances bear only a distant relation to the Elixir does not, however, suggest that there is no use for them in the Art. Boraces, nitre, and sal ammoniacs are employed, in addition to their various other uses, in the preparation of unstable dyes. And, indeed, these dyes could be made stable and permanent, but after a great deal of labour. Anyone who succeeds in carrying out this operation has certainly reached to the highest position in the Art.

Jildakī then gives a few quotations from Jābir. The latter says that some people may desire to isolate the soul of mercury from its body, or the heat of blood from its moisture, or the colours of gold and silver from their respective bodies, etc.; but these operations are very

difficult if not impossible. Besides, he adds, there is no need to go through these elaborate operations when Nature has already placed at our disposal tinctorial souls, pure bodies which act as carriers for the souls, and spirits which function as a liaison between the two former. Then Jildakī, incredible though it may seem, calls Socrates again to witness, and there are three excerpts attributed to him. In the first instance, Socrates criticizes those stupid people who pass hasty judgments on one's statements without careful consideration or any understanding of what these were intended to convey. In the second excerpt Socrates says that no combination of animal souls and bodies, however firm and stable it may be, can have the necessary power of penetration and assimilation unless it either includes mercury or is fumigated with sulphur. Following this, there is a passage from Jābir, in which the latter explains the words of Socrates. Jābir says that alchemists accepted the opinion of Socrates and were subsequently able to extract mercury and sulphur from all substances. Therefore, mercury and sulphur may appear in many different forms, and a great number of substances can act as substitutes for them; oil and tincture, for example, can represent mercury and sulphur respectively. Any other explanation of the words of Socrates, such as a literal interpretation of the terms mercury and sulphur, is,

according to Jābir, wrong. The third excerpt of Socrates refers to a theme which we have discussed before, namely, the relative immunity of minerals from the attacks of natural forces on account of their being hidden in the depths of the earth, and similarly the susceptibility of animals and vegetables to those attacks on account of their existence on the surface of the earth.

Jildakī then quotes a verse from Hālid as follows:

"Leave alone the ores of the earth altogether,
And turn to the animal which has perfect intestines"

This verse, comments Jildakī, must not be interpreted literally. Hālid did not mean that animal substances must be preferred to minerals for the preparation of the Elixir. Minerals, as we know, have no souls and no movements; they lack the powers of growth and nutrition. The stone of the alchemists, on the other hand, possesses all the qualities mentioned; and that is why it is compared by Hālid, in a figurative way, to an animal.

Referring to the blackening effect of sulphur on silver, Jildakī says that, had the black colour been permanent, it would have in time turned into red, because the black colour which appears on the surface is nothing but concentrated red. "These will turn copper yellow", says the Sheikh, meaning by 'these', according to Jildakī, the tutias which in this respect have an effect similar to that

of silver, namely, reducing the redness of copper to yellowness. And when the Sheikh says "this does not make it complete", 'this' refers to silver, because vinegar and acids will rust the copper to which silver has been added, just as they rust common copper. But when he says "and which is not affected by the process of removing lead in refinement", the pronoun 'which' refers to the yellow copper thus produced and not to the silver, because the former is not affected by the above process while the latter is. As to the crumbly stones, they, too, are not suitable for the preparation of the desired Elixir, and that is why, says Jildakī, they were also rejected by the Sheikh.

Sheikh: "So we left these and came to the metallic minerals, and we projected red copper upon silver, and it fused homogeneously with it and mixed with it and tintured it, but it fell short of the Elixir of Gold in its action by two things, namely, permanency so that it should not be separable by refinement, and power of completion, so that the substance should be transformed into gold differing in no property (from pure gold)." (1)

Copper falls short of the Elixir of Gold owing to its excessive hotness and dryness, explains Jildaki.

Sheikh: "In the same way tin melts with copper and mixes with it and tinctures it, but lacks

1. Tr., pp. 19, 20; Es., Vol. I., p. 95.

permanency and power of completion, since it crumbles copper when mixed with it, and separates from it in refinement, as does silver [and is made free in refinement]".⁽¹⁾

Just as copper resembles in colour the Elixir of Redness, says Jildakī, so tin resembles in colour the Elixir of Whiteness. Tin is fusible, soluble, miscible, and tinctorial, all on account of its excessive moisture. But this moisture is almost completely of the mercuric type and there is very little 'pure, sulphuric oiliness'⁽²⁾ in it. So the excessive hotness and dryness of copper instead of being balanced by the moistness of tin, are increased by the dry, and inflammable components of the latter, and as a result a crumbly substance like marcasite is produced. The statement of the Sheikh "and is made free in refinement", may be considered as being false, or possible, or true, according to our point of view. It is false because copper and tin are known to form a permanent mixture, with no possibility of separation, if they are mixed in a certain definite proportion in weight. It is possible because, when this proportion is not observed, the excessive amount of either of the two metallic forms separates from the rest in refinement. And

1. Tr., p.20. ; Es., Vol.I., p.96.

2. الدهانة الصافية الكبريتية

finally the statement is true because the mixture of copper and tin is saved from corruption by being burnt in the refining fire.

Sheikh: "Similarly mercury mixes with copper and tinctures it, but lacks permanency and power of completion. So that which we seek is not to be found among the elementary minerals [among the simple substances]; hence the substance must be a compound possessing the powers mentioned, and we examined the metallic chemicals suitable for this purpose. And we found no substance from which it was proper to compound the Elixir except gold, for gold is fusible and miscible and tinctorial, not actually but potentially, stable and perfecting, since the agent should be better than all else in its power of completion. But we found that when it is projected upon silver there is no action save that which the latter has upon the gold, and we found that the gold separates from the silver in the refining fire. So we knew that gold is the most perfectly adjusted of all bodies; it does not contain excess of tinctorial power by which it can tincture anything else, nor does it contain excess of heat to heat the silver and fix it, and to give the fire power to accelerate the reaction with it."(1)

By 'simple substances' the Sheikh means here, according to Jildakī, the metallic minerals. But the latter are not simple substances; they are compounds; and the purpose of the Sheikh in calling them simple is twofold, explains Jildakī. Firstly, the metallic minerals are capable of

1. Tr., p.20; Es., Vol. I., pp.97, 98, 99.

combining with other substances, and in that sense they are simple; and indeed if they did not enter into combination, the Art would be reduced to nothing. Other substances, such as sulphurs, arsenics, spirits, and mercuries, are also called simple on account of their capability to generate, like the sperm of man, the egg of the animal, or the seed of the plant. Secondly, the Sheikh wished to point out that the production of the Elixir from only one of the so-called simple substances is impossible.

Jildakī then praises the Sheikh, as he often does, for his systematic treatment of the Art, adding that with the exception of Jābir none of the philosophers he knew equalled him in learning; and even the latter, though he left nothing untold, was understood only by the initiates. So we see that the Sheikh after having dealt with the simple substances, with regard to their suitability for the production of the Elixir, turns to the compounds. But it must be understood from the very beginning, Jildakī goes on, that there is no substance, be it simple or compound, that possesses, before the operation, all the properties of the Elixir either potentially or actually; only some of these properties are possessed in a potential or actual form by various substances. When the Sheikh says "and we examined the metallic chemicals suitable for this purpose", by 'suitable' he means having a 'close relation' with the

Elixir; and if we found a substance which possessed enough of the properties mentioned - not less than a specified proportion - we would say that this material is the potential source of the Elixir. "And we found no substance from which it was proper to compound the Elixir except gold," says the Sheikh, and by gold he means the gold of the philosophers and not common gold. And if one protested and said, argues Jildakī, that the Sheikh was referring to common gold because the philosophers' gold is nothing but the Elixir itself, we would answer that in general the philosophers are in a habit of calling gold anything which has a balanced constitution. Now common gold is imperfect and has, therefore, no balanced constitution, while the gold of the philosophers is pure and perfect and suitable, on account of its tenderness, aptitude, and spirituality, for the generation of the Elixir. And know, says Jildakī, that the term gold is applied also to those substances which are stable, resist fire, and are quick in acquiring the properties of the Elixir. The adverbial phrase "not actually but potentially" applies to all the three preceding adjectives of the gold, namely, 'fusible and miscible and tinctorial; and is not confined only to the last one. And, indeed, these and other properties which the stone, the raw material of the Elixir, possesses in common with the latter,

are all in a potential form. It is only after the transformation of the stone into the Elixir that the properties mentioned appear in actual form, acquire a new significance and become more intensive. By the 'agent' the Sheikh implies, according to Jildakī, the principle of hotness which is responsible for completion, in contrast with the principle of coldness which is responsible for imperfection.

Sheikh: "And so it is necessary that we should feed it(1) with moisture of its own kind united with dryness of its own kind, so that when the hotness is increased in it, the food combines with the gold, and the gold changes the food into its own essence; and the gold is the cause of its permanence in the fire, and the food is the cause of its tinctorial power and purple colour. It becomes hot, dry, red, and easily fusible. When it is projected upon silver it tinctures it and fixes it and completes it and changes it to its own essence and makes it reach the most perfect of its conditions."(2)

After pronouncing another eulogy upon the Sheikh, Jildakī says that there is generally no need for studying any other book on alchemy if one has thoroughly read the K. Al-Muktasab and his own commentary - the present book- on it.

1. 'It' refers to gold or, as was mentioned before, to any substance which is found to be suitable for the production of the Elixir and for that matter is also called gold.

2. Tr., p.20; Es., Vol.I., p.103.

The Sheikh has described, he says, the whole Art from the beginning to the end, in two phrases, namely, 'moisture of its own kind' and 'dryness of its own kind'; they express the two fundamental principles of the Art. A poem of Ṣāhib al-Ṣudūr is quoted here in which the action of fire and water, representing dryness and moisture respectively, is described. From the rank of impure and abominable substances, that is how the poem goes, an essence is derived which is then washed, pounded, dried, and treated several times with water and fire until it becomes pure and capable of embodying the soul, whereupon it is made alive and must be given food and water for nourishment and growth.

The heat of the maturing fire, Jildakī goes on, increases the natural heat of the food, an essence composed of moisture and dryness, and strengthens also the natural heat of that essence, which is called gold by the Sheikh. Consequently, the food is transformed into the essence of gold, just as a different kind of it is changed into blood in the human body. And indeed all the perfect bodies possess the power of digesting their own food and transforming it into their own essence. In this connexion Jildakī quotes a short poem of Ṣāhib, in which the transformation of food into blood

by human body and the generation of sperm from blood is described.

The food, continues Jildakī, which is at first volatile, sinuous and spiritual, becomes, after its transformation into the essence of gold, stable, upright and material. So, a spiritual substance acquires freshness, beauty and perfection, accompanied by the appearance of purple colour.

"It becomes hot, dry, red, and easily fusible", says the Sheikh. The Elixir of Redness, comments Jildakī, is hot and dry, not absolutely but relatively, that is in comparison with silver and the Elixir of Whiteness. Hot and dry are the component principles of the element of fire, and the latter is corruptive so far as the combustible substances are concerned. Now, does this mean that the Elixir of Redness behaves exactly like fire? Of course not, answers Jildakī: the reason why the Elixir of Redness is described as being hot and dry is that it has the power of destroying accidental properties and not, as one might imagine, the combustible substances. Its action is similar to that of hot medicines which provoke vomiting and thereby cure some of human diseases. Moreover, the Elixir of Redness is said to be dry on account of its earthiness, not its hardness. As a matter of fact, the Elixir of Redness has a

soft body and becomes oily on melting. The Elixir of Redness has the best and the most perfect of all colours, because red is associated with the first element, namely, fire. And know, Jildakī goes on, that the four simple colours are red, yellow, white and black; other colours, such as blue and green, are compound. One might argue that red is not the colour of fire but of air and hence of blood - the proper colour of fire being yellow. The answer is that air is a colourless element and the redness of blood is due to fire alone; not to mention the fact that red is nothing but concentrated yellow. So it becomes evident that the Elixir of Redness has been described as hot and dry mainly because of its red colour, which is closely associated with fire. Besides, the Sheikh says that the Elixir of Redness is also fusible, which implies that it is moist and, therefore, could never be dry.

Sheikh: "The Elixir of silver is a part of the Elixir of gold, at a certain stage before the perfection of its maturity and completion of its quantitative composition. It is white, stable, cold and moist in comparison with the Elixir of gold. When it is projected upon the two coppers or the two leads it converts them into silver."(1)

1. Tr., pp.20, 21; Es., Vol.I., pp.108, 109.

Jildakī believes, in contrast with the opinion of the Sheikh, that the Elixir of silver is formed after the perfection of maturity of the Elixir of gold, but before the completion of its quantitative composition. For before the perfection of maturity it is impossible for the Elixir of silver to be formed, while after the completion of the quantitative composition its formation is long overdue and the red colour of the Elixir of gold has already appeared. The rest of the statement of the Sheikh is quite clear, says Jildakī, and does not need to be enlarged upon.

Sheikh: "And know that animals and plants have three powers, viz., the power of feeding and the power of growth and the power of reproduction. The power which acts upon the foodstuff and changes it to the likeness of the eater to make up for those parts of the latter which waste away, is called feeding. The power necessary for the symmetrical increase of its members in natural proportion and not fortuitously, until they reach their limit of size, is called growth. The power which causes the separation of the superfluity of material so that it may become the beginning of another individual is called reproduction. And this power makes use of the first two, and growth makes use of feeding, and feeding makes use of four powers: (1) attraction, since it must be able to draw in the food; (2) digestion, since it must have a power to mature the food, so that it may be rendered fit for reception and transformation; (3) retention, since it must retain the food for the length of time during which the digestion is working upon it; (4) rejection, since it must be able to reject the superfluous

part which is not suitable for the eater. Now feeding is distinct from growth and reproduction, for it remains after them until the end; and growth is distinct from reproduction, for it is found without the latter, as in the young.

"These three powers taken as a whole are called the Vegetative Soul."(1)

The order of precedence of the three powers must always be observed, says Jildakī. For, if there be no nutrition, there can be no growth, and if there be no growth, there can be no reproduction. These powers are originally spiritual and cannot be described except through their effects. Each body must have its own special, appropriate food in order to be able to transform it to its own essence. The function of the power of nutrition is not the same in animal and plant. The plant has no other food except water and the soft part of the earth or soil. The heat of the sun, which is the cause of the power of nutrition in the plant, strengthens the already existing gentle heat of the soil attached to the roots and combines water with soil to form the food which flows through its veins. The cause of the power of nutrition in the animal is its natural heat and, in contrast with the plant, this exists within its body. The function of the

1. Tr., p.21; Es., Vol. I., pp.109, 110, 112, 113, 114.

power of growth is the same in both animal and plant, while that of the power of reproduction is different in them. The power of reproduction in the plant resides in its seed which is carried about by natural means until it reaches the fertile ground and gives birth to its like. The power of reproduction in the animal is associated with a lust, common to male and female, which drives them into voluntary sexual intercourse, whereupon a superfluous material of the male's body, invariably called semen, sperm or water, comes into contact and is united, in the womb, with a similar material contributed by the female, and thus the formation of a new life is realized.

So we see, continues Jildakī, that there are three main powers, just as there are three dimensions and three kingdoms. The most important of the three powers is the power of nutrition, which supports the power of growth, and then both of them support the power of reproduction. The power of nutrition is itself supported by four auxiliary powers, namely, attraction, digestion, retention and rejection. Attraction of food by a body is similar to the attraction of iron by a magnet. The power of digestion cooks the food and matures it and then separates it into two portions, soft and coarse. In the plant, the soft portion, which is pure food, is employed by the power of growth, and the coarse portion goes to make the bark, the gum and the redundant

parts. In the animal the soft portion takes the form of blood and is also employed by the power of growth. But the coarse portion or the sediment is divided into four parts, namely, the yellow bile, the black bile, phlegm and excrement. The power of retention, after the completion of cooking and the division of food, loses its grip over the latter and applies it to the new food which is then taken in. Again the power of digestion enters into action and the same process is repeated as long as the animal is alive. The power of rejection is responsible for the formation of bark in the plant and for the expulsion of excrement in the animal.

The powers of growth and reproduction are active only during a certain period of the life of the individual plant or animal. The power of nutrition, on the other hand, is ceaselessly in action during the whole life from the beginning to the end. Moreover, the period of growth does not exactly coincide with the period of reproduction, and each of the two powers of growth and reproduction may exist irrespective of the other. A baby grows but does not reproduce, while a person of middle age reproduces but does not grow.

The reason why "these three powers taken as a whole are called the Vegetative Soul", is that the vegetable existed

before the animal and was the first to employ these powers, not to mention the fact that it constitutes the bulk of animal food. Apart from the three negative powers mentioned above, there are other powers, such as the power or faculty of perception, which are employed by human beings, but this is not the proper place, says Jildakī, to deal with them. A poem from Ṣāhib, which is quoted here, makes a comparison between two persons, one of them using his intellect and the other letting it fall into decay. The former prospers and gains insight into the inner parts of things; the latter, on the other hand, will remain in darkness and misery for ever.

"What a difference between the two; this a planet
Which revolves, and that a centre for the centres."

Sheikh: "The metal also has these powers, namely, feeding, growth, and reproduction, and reproduction is served by feeding and growth, and growth is served by feeding. But here, feeding is served by a single power, namely, digestion, for the food is mixed in the metal without attraction on its part, and digested without retention. Hence this power does not raise the food to its highest point, since retention is necessary in order to render the digestion able to do this. Moreover, the metal does not possess the power of rejection, by which it can reject what is not appropriate for it. For the power of rejection rejects only that which resembles [which does not resemble] the chyme of the constitution. So that since the metal does not possess the

power of rejection, when food is administered to it it assimilates both the suitable and unsuitable and that which is born from it is not of the same species."(1)

Since the metal, explains Jildakī, is originated in the depths of the earth and in complete darkness, it is not porous and has a tendency to descend. This prevents it from absorbing the food and from raising it to its highest point. Both animal and vegetable, on the other hand, are porous and have a tendency to ascend, so that they are able to attract the food and raise it to their uppermost parts. So there is an upward motion of food both in animal and plant. Again, Jildakī goes on, because of its tendency to descend to the centre, the metal lacks the power of retention and is not therefore able to retain the food at a certain level and for a certain time, to enable the power of digestion to act upon it. Similarly, there is no power of rejection in metal, and so it is not able to differentiate between what resembles the chyme of its constitution and what does not. That being so, the metal mixes with like and unlike substances during the course of its generation, and this is what makes the metals different one from the other. The result of all

1. Tr., pp. 21, 22; Es., Vol. I., p. 116.

this is that the metal cannot reproduce itself, and there are no metal seeds or eggs or sperms: iron is not born from iron, neither copper from copper, etc. The imperfection of five metallic forms is therefore due to the existence of inappropriate substances in their constitution.

Sheikh: "Now since the metal is such that it does not possess the power of rejection philosophers found it necessary to prepare the foodstuff in such a way that there was removed from it what was not suitable for the substance fed, for fear lest they should introduce it into the (metallic) species, which has no power of rejection, and that thus there would be mixed with the material appropriate for the constitution that which was not appropriate, in which case the species on reproduction would be confused and no advantage would be derived."(1)

One cannot reach to the ultimate purpose of the Art, comments Jildakī, unless he has thoroughly understood the theoretical side of it before entering into practice. Only a small and select group of people are capable of such comprehension, and it is for them that the books are written, so that they may understand the secrets of creation, the features of existence, the meaning of the life to come, and the transmigration of souls. Outside this group, the rest of mankind are stupid people who could never grasp the inner

1. Tr., p.22; Es., Vol. I., pp.118, 119.

meaning of philosophical problems; they confine themselves to appearances and trivialities, and are therefore led astray. To confirm his views, Jildakī quotes a long poem of Ṣāhib al-Ṣudūr, elaborating the same thesis. He then adds that nothing has been left untold in his book and that is why it has been called 'The End of the Search'.

The material of the food for metals, says Jildakī, exists in nature, and so the only thing the philosophers have got to do is to remove from it the unsuitable part. Even the plant and the animal, though they possess the power of rejection, are none the less not completely indifferent to the suitability of their foodstuff. Different regions and climates have different floræ and faunæ. So a plant which belongs to regions having fresh water will soon wither if it is given saline water. An animal, also, may die if it takes in the kind of substance which is not suitable for it.

Sheikh: "The philosophers therefore had to prepare this material and to remove from it those parts of it which were not suitable for the species. And this was not completely possible for them except by dissolving the material in a particular weight of appropriate moisture: it is not possible to dissolve it in this moisture except by this weight, a thing which cannot be put clearly." (1)

1. Tr., p.22; Es., Vol.I., p.125.

The Sheikh says 'appropriate' moisture, and by that he means, according to Jildakī, a special kind of it, not everything which goes under that denomination. As to the 'particular weight', the Sheikh either means, continues Jildakī, that there must be a definite ratio between the weight of the substance and the weight of appropriate moisture, or he is just referring to the suppression of the dryness of the substance by the appropriate moisture, which is superior to it in nature and power. In the latter case the term 'weight' must not be interpreted literally: it only conveys the excellence of moisture with regard to dryness. Therefore, when the Sheikh says 'a thing which cannot be put clearly', he is either referring to the ratio in weight, or to the manner of mixing the substance with moisture. In any case this is what the philosophers have always refrained from divulging, and the reader may only hope that he will be informed by heavenly inspiration. Nevertheless, Jildakī goes on, we shall give him some gentle hints on this matter in the remaining part of our book.

Sheikh: "This prime matter is one, that is, derived from one thing and not from separate things nor from things distinguishing or distinguished. Rather it is derived from a single species, for when divers things which differ essentially are compounded together, the fire will separate them."(1)

1. Tr., p.22; Es., Vol. I., p.128.

Jildakī begins his explanation here by defining matter⁽¹⁾ and the prime matter⁽²⁾ "Matter is a simple, corporeal substance capable of combination. As to the prime matter, take any material which is composed of two parts, one of them dissolved in the other; the solvend is called prime matter, and the solvent, form." It is not possible to separate the prime matter from form. The prime matter is not a cause of form, because nothing could actually exist before having a form, whereas the efficient cause precedes the effect. Similarly, form is not a cause of the prime matter, because form is always associated with figure, and figure could not precede the prime matter. So, form and the prime matter are not in any sense independent of one another.

It is possible to transform the simple matter into the prime matter by an operation which is kept secret. This transformation, however, is similar to that of food and that of sperm. Another good example is the production of a mirror. This could not be produced from the original ingredients of glass without suitable operations. Sand is

1. مادة

2. هبولى

first melted with manganese, and the flowing product which is glass is left to become solid. Then different kinds of mirrors can be made from glass, according to one's desire.

The statement of the Sheikh that 'this prime matter is one', is nothing more than a metaphor, says Jildakī. For oneness excludes divisibility, while the prime matter is divisible. The prime matter is one just as the 'troop' is one or the 'civilization' is one.

But it is true, as the Sheikh said, that diverse things when compounded disintegrate in fire. This was also the opinion of Aristotle, Jildakī goes on, who said that it is not possible to compound a thing fortuitously or to transform everything to that we desire: there must be a natural relation between the solvend and the solvent, between the transforming substance and the thing to which it is transformed. Animal substances such as egg, hair, and galls-vesicle, when treated with fire react in a different way in comparison with vegetable or mineral substances. So the prime matter may not be composed of substances belonging to different kingdoms, neither of substances possessing different natures (hot, cold, dry, and wet).

Sheikh: "And this material cannot exert its proper action until it has been split up and (re-) combined, after which this particular property is manifest in it." (1)

1. Tr., p.22; Es., Vol. I., pp. 130, 131.

By 'this material' the Sheikh means, comments Jildakī, the simple matter which we defined. Now we want to transform this simple matter to the prime matter. In order to do this we must first split it and remove the corrupt part of it, which prevents it from having a perfect constitution, whereupon it will acquire the desired properties. A poem of Ṣāhib al-Ṣudūr, which describes the same thesis, is quoted here by Jildakī.

Sheikh: "The splitting up is necessary only for this reason, that the Elixir is nothing more than the cultivation of gold, and so they found it necessary to have a food which they could introduce into this species to cause it to grow and ripen and bear fruit. So they took a foodstuff which would mix with that species in its natural state with a generative mixing, not a "corrupting one, in order that it might become of its essence."(1)

The Art, explains Jildakī, is exactly analogous to agriculture. The farmer ploughs the fertile land, removes the things which are deterrent to cultivation, then sows the seeds, irrigates the area, and attends carefully to his work, until germination takes place and in the end he is rewarded with a multiple amount of what he sowed. Similarly, the philosophers cultivate the gold in their clean land,

1. Tr., p.22; Es., Vol. I., pp.131, 132.

give it proper water, and finally reap a multiple amount of the original gold. The farmer did not split the seed by grinding it before cultivation. In the same way, the philosophers do not split the gold, but they split the foodstuff. The latter comes forth in its ore, because of natural indispositions, similar to the five metallic forms, in an imperfect state. The reason for this is two-fold. In the first place, the ore is originated in those regions which are far from equilibrium. The second contributing factor is the lack of the power of rejection.

Now, just as plants originate from earth and water, so the metals originate from smoke and vapour. Again, just as the two former are the proper food for plants, so the two latter are the proper food for metals. By 'its natural state', the Sheikh may mean, according to Jildakī, the state of the (metallic) species either at the time of its generation, or at the time of its cultivation. But it must be understood that a foodstuff might mix with the (metallic) species in a generative way and yet fail to make it grow and transform into the Elixir. For example, it is possible to extract from animal and vegetable substances a water, an oil, and a sal ammoniac; and, after dissolution and purification, adding them to the species, they will give the latter the appearance of the Elixir. But this elixir will

disintegrate in the refining fire. That is why the Sheikh said that the foodstuff 'might' become of the essence of the species, that is, there is no certainty that it will. All this, Jildakī goes on, has been mentioned by Jābir in his books. The latter has thoroughly discussed the properties of animal, vegetable, and mineral substances, and has indeed dealt with all the natural and mathematical sciences in his numerous books such as The 500 Books, K. al-Juhar (The Book of Essence), K. al-Hajar (The Book of Stone), K. al-Hudūd (The Book of Limits), K. al-Hawāṣṣ (The Book of Properties), and K. al-Muṣahahāt al-Aflātūnī (The Book of Rectification of Plato).

Sheikh: "And they added to it moisture which decayed it and dissolved it and made it volatile [And they added to it, by moisture it decayed it and dissolved it and made it volatile] ".(1)

'And they added it to it', the Sheikh says, and he means, explains Jildakī, that the philosophers added the food to the feeder. The moisture to which the Sheikh refers was originally added to the food, as it was mentioned

1. فاد خلوه عليه برطوبة عفنتها وحللتها ولطفنها Tr., p.22; Es., Vol. I., p.135. It must be noted here that though the translation of the above sentence as given by Dr. Holmyard seems to be the only one which could make sense of a confused statement yet Jildakī had a different opinion. The latter thought that the Sheikh made his statement intentionally obscure. The translation which appears in brackets is in agreement with the interpretation of Jildakī.

before,⁽¹⁾ to overcome its dryness, and one must not think that it is an extra amount of moisture which is added at this stage. As to the second part of the statement, that is, 'by moisture it decayed it...', the agent here is Nature, which, through one of its instruments, i.e., moisture, decays and dissolves and volatilizes the foodstuff.

Jildakī in his explanation of the above statement of the Sheikh goes further into details and deals with grammatical problems, to which I have not referred in my account.

Sheikh: "And when it was volatilised it ascended to the top of the vessel as a food with no heavy parts [with no dregs⁽²⁾] therein; but a light sediment is left over underneath it, called the salt. A dry fire will make this volatilize, and it rises like filings of silver, free from the blackness of the earth and its darkness and coarseness."⁽³⁾

To justify his own interpretation of the previous
(4)
quotation from the Sheikh, Jildakī resorts again to grammatical considerations, and quotes also a poem of Ṣāhib al-Ṣudūr, referring to him on this occasion as Al-Imām Abū al-Ḥasan 'Alī ibn Mūsā. He then begins to explain the above

1. See p. 73 above.

2. Pt. : نقل ; Es. : نغل .

3. Tr., p.22; Es., Vol. I., p.138

4. See p. 78 above.

passage.

Decaying or putrefaction represents the first stage and takes place, says Jildakī, when the foodstuff is still in its mineral state. Dissolution, the second stage, represents the transition of food from mineral to vegetable status. Volatilisation, the third stage, represents the transition of food from vegetable to animal status. But when the food volatilizes and ascends to the top of the vessel, it will become free from all impurities and appear in a spiritual form. After the ascension of the volatile natures, the fugacious souls, the foodstuff, the temperate waters, the unflammable oils, and the vegetable gums, a light sediment, called the salt, is left over. This salt must be present in all volatile substances in order to protect them from fire, and it remains at the bottom of the vessel after their ascent. The salt volatilizes by dry fire, appearing like silver filings, and for this reason the philosophers have called it 'the garland of victory'.

Sheikh: "It is now a ploughed ground, while the first food is a chyme-like water, and they grow their embryo, nay rather, their seedling, in this ploughed ground, and water it with their chyme-like water, carefully bringing it up with a gentle heat. And this metallic plant grows, and ripens and bears fruit and pleasant

(1)

flowers, and turns into an exalted [a poisonous] leaven. If it is projected upon silver it transforms it into gold more excellent than the gold of mines."⁽²⁾

The ploughed ground has two components, explains Jildakī. The first component is the volatilized salt, or the garland of victory, which, on account of its being volatile and free from all impurities, does not by itself constitute a suitable ground for cultivation. The second component is a new earth we add to the pure, volatile one to enable it to take hold of the seedling. When the Sheikh says "It is now a ploughed ground, while the first food is a chyme-like water", he means that the pure earth has now got rid of the chyme-like water which it at first possessed and has thus become a thick, heavy food, suitable for the metals. By 'embryo' the Sheikh means the child of the Art and the borne spirits;⁽³⁾ and by 'seedling' he means the reserved red-gold, the raw material, and the foliated gypsum⁽⁴⁾. And when the Sheikh says "and water it with their chyme-like

1. سميا

2. Tr., pp.22, 23; Es., Vol. I., p.141.

3. مولود الصناعة والنفس المحمولة

4. الذهب الاحمر الحابى و الجمى النى والطلق المصفح

water", he is referring to the saliva of vipers.⁽¹⁾ Later in this book we will discuss, continues Jildakī, the amount of heat required and the manner of bringing up, with regard to the statement of the Sheikh: "carefully bringing it up with a gentle heat." When the metallic plant bears fruit, the operation is complete, and the 'pleasant flowers' to which the Sheikh refers signify the appearance of beautiful colours. The 'poisonous leaven' is nothing but the Elixir, and the adjective 'poisonous' describes its power of penetration and transformation and reproduction. For poison penetrates into the substances with which it is mixed and transforms them into its own essence and thus infinitely reproduces itself. And that is why some philosophers have said that one dirham of the Elixir, if prepared properly, is sufficient to fill all the space between the East and the West. The gold which is produced by the projection of the Elixir upon silver is better than the gold of the mine. For the gold of the mine is mixed with silver and is separated from it by 'suspension',⁽²⁾ and the best gold produced by this method is called 'jāyiz' (permissible; admissible; lawful) and is 24-carat fine. The gold of the philosophers, on

1. لعاب الأفعى

2. تعليق

the other hand, has a purple colour and silver must be added to it if it is to be converted into 'admissible' gold - the amount of silver used for this purpose is inversely proportional to the fineness of the philosophers' gold. Now, if silver is added to the 'admissible' gold, the latter will become white and is separated from the former on 'suspension'; whereas the silver which is added to the gold of philosophers to make it 'admissible', does not separate by 'suspension', especially when this process is carried out in the manner of the philosophers.

Sheikh: "The prime matter which is proper for the form of the Elixir is taken from a single tree which grows in the lands of the West. It has two branches, which are too high for whoso seeks to eat the fruit thereof to reach them without labour and trouble; and two other branches, but the fruit of these is drier and more tanned than that of the two preceding. The blossom of one of the two is red, and the blossom of the second is between white and black. Then there are two other branches weaker and softer than the four preceding, and the blossom of one of them is black and of the other between white and yellow."(1)

The Sheikh, comments Jildakī, after having defined matter and prime matter, described for us the processes of dissolution and purification, the stages through which the matter must pass before becoming food, the cultivation of

1. Tr., p.23; Es., Vol. I., pp. 144, 145.

gold, and the formation of the Elixir. He now begins to tell us about the origin of the prime matter by way of allegory, as is the habit of the philosophers; and though we will try to explain thoroughly the meaning of his statements, there are occasions, Jildakī goes on, when we will not go beyond giving you a few hints.

The statement of the Sheikh, that "the Elixir is taken from a single tree", is similar to his other statement, mentioned before, ⁽¹⁾ which read: "This prime matter is one, that is derived from one thing and not from separate things..." And according to what was explained in connexion with the latter statement, by 'single tree' the Sheikh implies that the prime matter is chosen from one species only, and not more. The attribution of the prime matter to the 'lands of the West', implies that it is cold, moist, and found in dark places, hidden from the sun, like the bottom of the wells, the ends of the caverns, and the hollows of the oceans.

The first 'two branches' to which the Sheikh refers are gold and silver, each of which is divided into two kinds: the common kind and a kind ascribed to the philosophers. And it is the gold of the philosophers, and their silver, which one

1. See p. 73 above.

could not obtain without possessing mental aptness and enduring many troubles. As to the second 'two branches', they are copper and 'Mars', each of which are in turn divided into two kinds: the common kind and the kind ascribed to the philosophers. The common kind of copper is metallic copper, and the common kind of Mars is metallic iron, both of them in daily use. The copper of the philosophers is the dryness to which, says Jildakī, we referred previously. (1) The Mars of the philosophers is the generic sal ammoniac. And there is no doubt that both kinds of copper and Mars are drier and more tanned than gold and silver. By 'blossom' the Sheikh means colour, and it is a common knowledge that the colour of metallic copper is red and that of metallic iron is between white and black. The copper of the philosophers is red at the beginning, and, though it becomes white in its outward appearance later on, its interior turns red. The iron of the philosophers is white like pure silver, but after a second combination it suddenly becomes black. The third 'two branches' are 'usrub (2) and 'ānuk (3); the former is black and the latter is between white and

1. نو شادر الجنى

2. Perhaps black lead : اسرب

3. Perhaps pure lead : انك

yellow. The common 'usrub and 'ānuk are included among the ordinary metals. The 'usrub of the philosophers is Saturn which represents the stage of the first combination in the philosophical tree. The 'ānuk of the philosophers is Jupiter, which represents the stage of 'first whiteness after blackness', turning into a colour between white and yellow later.

Sheikh: "And this tree grows on the surface of the ocean as plants grow on the surface of the earth. This is the tree of which whosoever eats, man and jinn obey him; it is also the tree of which Adam (peace be upon him!) was forbidden to eat, and when he ate thereof he was transformed from his angelic form to human form. And this tree may be changed into every animal shape."⁽¹⁾

The tree to which the Sheikh refers is wisdom, explains Jildakī, and the ocean is science. To eat of the tree is to become initiated into the Art and philosophy. And the submission of man to one who has been initiated into the Art is due to the latter's access to the greatest riches on earth. The submission of the jinn, on the other hand, is due, according to the philosophers, to the superiority of the student of the Art in knowledge. The philosophers have indeed said that the possession of the Elixir enables one to

1. Tr., p.23; Es., Vol.I., pp. 148, 150, 151.

achieve extraordinary and talismanic results. Jābir has referred to this on many occasions, but want of space prevents us, says Jildakī, from giving an account of it here. Hālid ibn Yazīd claims in his Ṣaḥīfa (Register) to have treated a great number of people, afflicted with chronic diseases, in Damascus, by making use of the talismanic properties of the Elixir. We have not yet reached, continues Jildakī, to such an eminent position in the Art as to be able to deny or to prove the allegations concerning the magical powers of the Elixir.

The statement of the Sheikh, that "it is also the tree of which Adam was forbidden to eat...", may be interpreted in two ways, comments Jildakī. As there is a close similarity in action and effect between the philosophical tree and the tree of which Adam ate - they are both worldly and cause transformation, one transforms angel to man and the other base metals into gold - so the Sheikh in an allegorical way regarded the two trees as one and the same. In the second place, the Sheikh possibly used each of the terms included in the above statement in a different metaphorical sense. By 'Adam', for example, he might have meant the root of the tree; and by transformation of angelic form to human form, he might have implied the 'second combination' and nutrition whereby the wandering soul descends and resides in the

eternal earth. Now, if the Sheikh had anything else in mind, apart from what we have expressed, says Jildakī, then the responsibility rests with himself. But those people, who have thought that, on the basis of the above statement, the Sheikh regarded wheat to be the tree to which he refers, are wholly mistaken.

The statement of the Sheikh, "And this tree may be changed into every animal shape", again may be interpreted in two ways. He either meant, according to Jildakī, that the fruit of this tree is a means of exchange, whereby it is possible to procure for any animal form the appropriate food which in due course will transform into the essence of that animal. And in this connexion it is worth-while to remember that the elementary material of all the existencies in the three kingdoms is one; and similarly there is no fundamental difference between them as regards their chyme-like food. Or, as an alternative explanation, the Sheikh meant that the fruit of this tree is capable of transformation from mineral to vegetable and subsequently to animal form. And in this respect it is well worth while to note that Zosimus in his Muṣḥaf al-Ṣuwar (The Book of Forms) describes the transformation of every animal on earth from one rank to another until it reaches the status of man. Jildakī then quotes a tetrastich from ṣāhib concerning the philosophical

tree and its fruit.

Sheikh: "The prime matter is also found in a bird, whose body is that of a man but its two wings, the wings of a bird. It has four feet and two hands, but its feet are despised, while its hands are honoured on account of the benefit to be derived from them. But if ignorant man knew that the hands have no power save by the feet, he would be more watchful of the feet than of the hands."(1)

We observed, explains Jildakī, how the Sheikh compared the prime matter to a tree, and there is no doubt that the tree is a vegetable and therefore potentially capable of being transformed by a secret process into an animal, say, a bird. The prime matter consists of two parts: stable and volatile. The stable part is a body, that is to say, it has three dimensions, and in this sense the philosophers make no distinction between the body of a man and that of a bird. The volatile part of the prime matter, on the other hand, is compared by the Sheikh to the wings of a bird.

By the 'four feet', the Sheikh implies the imperfect metallic forms, and by the 'two hands', he means silver and gold. The ignorant man does not know, in the first place, that the feet and hands are of one species, though in

1. Tr., p.23; Es., Vol. I., p.152.

different states of perfection. And one who is not aware of the existence of the imperfect would not fully appreciate the perfect. Moreover, the ignorant man does not realize that the feet succour⁽¹⁾ the hands, just as the four natures succour all the existencies, or the foodstuff succours every individual in the three kingdoms, etc. But if the ignorant man knew all this, "he would", as the Sheikh said, "be more watchful of the feet than of the hands."

Sheikh: "And this prime matter is found in the cold peninsula of Andalusia on the shore of the Ocean wherein are the caverns of Al-Astiyūsia."⁽²⁾

The alchemists, explains Jildakī, are in the habit of referring to the general when they mean the particular,⁽³⁾ and this is one of their secrets. Now, some of the philosophers have expressly maintained that only the female component of the prime matter, on account of its coldness, is found in Andalusia. Some other philosophers have said that the female component is born from the male component and is to be found wherever the latter is originated. The

1. مدد

2. Tr., p.23; Es., Vol. I., p.154.

3. اطلاق الكل و ارادة الجزء

reason why Andalusia is cold, argues Jildakī, is that its latitude, 35° N.,⁽¹⁾ exceeds the obliquity of the ecliptic which is less than 24° .⁽²⁾ As regards 'the caverns of Al-Astiyūsiā, they are the hollow places where the prime matter is to be found.

Sheikh: "And it is often found in a mountain in the land of India, in rocks diverse in colour and taste and smell and properties."⁽³⁾

What the Sheikh means by 'the land of India', according to Jildakī, is equilibrium. The temperate part of the prime matter is found in a mountain in India. But often the mountain to which the Sheikh refers is interpreted to be the apparatus in which the temperate compound of the alchemists is prepared. The phrase, 'in rocks diverse in colour and taste and smell and properties', may imply either that the prime matter is found in rocks possessing the mentioned properties, or that by 'rocks' the Sheikh meant the drugs which are employed in the Art for the production of the Elixir, and they are indeed of different colours.

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1. Spain is included between latitudes $43^{\circ} 47'$ N. and $36^{\circ} 0'$ N.
 2. Present mean value $23^{\circ} 27' 3''$.
 3. Tr., p.23; Es., Vol. I., p.154.

Sheikh: "Among them is a rock in which a devouring lion takes shelter and often he defends it."⁽¹⁾

This rock, explains Jildakī, is one of the drugs employed in the Art, and it is hot and dry like the nature of the lion; and that is why the latter takes shelter in it and defends it, especially when he is quarrelsome.

Sheikh: "And the top of this rock is confused with [surrounds] ⁽²⁾ its base, and its nearest part reaches to its farthest, and its head is in the place of its back, and vice versa."⁽³⁾

The Sheikh defines this rock, explains Jildakī, in terms of the element of fire which prevails in it and is often represented in a globular form. Now it is obvious that the top of a globe "surrounds its base, and its nearest part reaches to its farthest, and its head is in the place of its back, and vice versa."

Sheikh: "Another of these rocks is carried by an [inflammable] ⁽⁴⁾ sea-animal which walks in a complicated way; this rock has two horns which appear at the moment of its birth, and by the time half of its life has passed they

1. Tr., p.23; Es., Vol. I., p.155.

2. Pt., : *كليس* Es., : *كيس*

3. Tr., p.23; Es., Vol. I., p.155.

4. The term 'inflammable' does not appear in Pt.

have encircled its body. And when half of its life has gone, the horns remain as they are until the end of its life. That is its habit at all times."⁽¹⁾

This rock represents, according to Jildakī, two other drugs which are employed in the Art. These two drugs are hot, cold, dry, and moist, all at once. They are dry and cold, and are therefore depicted as an earthy rock. They are hot and moist, and that is why they are delineated as an inflammable sea-animal. And the statement that this animal 'walks in a complicated way,' emphasizes the fact that these drugs, both of them, possess diverse natures. The 'two horns' represent the effusion of water and oil from the rock at the moment of its birth. For water and oil are hot and moist, and so are the two horns. The moment of birth represents the completion of the period of pregnancy, that is, the end of the revolution of Saturn and the beginning of the revolution of Jupiter, or, in other words, the beginning of separation.⁽²⁾ And, when half the life of the rock has gone, the separation is complete and the horns appear in spherical form. At this stage a cleansing operation is performed with water alone. The end of the

1. Tr., pp.23, 24; Es., Vol. I., pp.155, 156.

2. تفصيل

rock's life is when the combination is complete.

One must admit, I think, that the explanation of Jildakī on this occasion is not very illuminating. It would be interesting to know whether he really understood what the Sheikh said, but did not care to be more explicit, or whether his claim to understanding was mere pretence.

Sheikh: "Another is a rock which is frequently carried by a lustful animal which has on its neck the skin of another animal accustomed to bear [of another animal which acts as a reconciler and bears] (1) one of the two burdens [one of the two sediments] (2) This rock is the mineral of malice and wickedness and treachery and hatred." (3)

By this rock the Sheikh implies, according to Jildakī, a drug which because of its darkness and impurity has a wicked and treacherous nature. The 'lustful animal' represents another drug which on account of its lustfulness and hotness is light and strong and penetrating; and 'the skin of another animal' on its neck indicates that it is a compound. Moreover, its component part, that is, the part which is depicted as 'the skin of another animal', possesses

1. حیوان آخر مؤلف بحمل احد

2. Pt., : ثقلین ; Es., : ثقلین

3. Tr., p.24; Es., Vol. I., p.157.

the power of uniting opposite things and thus completing the operation. This part is also responsible for bearing 'one of the two sediments', for it acts as a 'reconciler' and has a spiritual nature.

Sheikh: "Two more rocks are there, one of them male and the other female, and still two more, one of them Egyptian and the other like a wise man⁽¹⁾ [and the other Georgian] ".⁽²⁾

The only explanation by Jildakī with regard to the above quotation is that these rocks are also certain drugs which are employed in the Art.

Sheikh: "And this prime matter is found in a mountain containing an immense collection of created things. In this mountain is every sort of knowledge that is found in the world."⁽³⁾

Jildakī in his explanation here, as on several other occasions, contends that the Art is the product and the synopsis of all other sciences. And the apparatus of the Art, that is, the 'mountain', embraces all the branches of knowledge.

1. Pt. : رجل حكيم ; Es. : كرجية

2. Tr., p.24; Es., Vol. I., p.157.

3. Tr., p.24; Es., Vol. I., p.158 : The first sentence of this excerpt does not appear in Es.

Sheikh: "There does not exist knowledge or understanding or dream or thought or sagacity or opinion or deliberation or wisdom or philosophy or geometry or government or power or courage or excellence or contentment or patience or discipline or beauty or ingenuity or journeying or orthodoxy or guidance or precision or growth or command or dominion or kingdom or vizierate or rule of a councillor or commerce that is not present there. And there does not exist hatred or malevolence or fraud or villainy or deceit or tyranny or oppression or perverseness or ignorance or stupidity or baseness or violence or cheerfulness or song or sport or flute or lyre or marriage or jesting or weapons or wars or blood or killing that is not present there. 'From India a king, from Egypt a wise man, and from Persia a swordsman.'⁽¹⁾

All these attributes, explains Jildakī, are potentially present in the prime matter of the Art. Some of them are related to the minerals, some others to different stages of the operation. Fraud, deceit, and malevolence are attributed to Saturn which represents the stage of pregnancy, the lead, the black lead, and the prevalence of blackness. Knowledge, dream⁽²⁾ (or forbearance), and munificence are attributed to Jupiter, which represents the stage of the formation of salts⁽³⁾ and dissolution. Sport, cheerfulness,

1. Tr., p.24; Es., Vol. I., pp.158, 159 : The wording of Pt. is different from that of Es.

2. حُلْم : dream ; حَمَل : forbearance.

3. درجة التالىح

song, flute, lyre, marriage and jesting are attributed to Venus, which represents the completion of the stage of the formation of salts, the beginning of the stage of separation, the appearance of colours, and the rising of spirit together with water⁽¹⁾ On distilling water, the philosopher hears a beautiful song, and the drops of pure water as they enter into the receiver produce the sound of a trumpet. And this gives the philosopher a great pleasure especially if it is his first attempt; for he then understands that he is moving in the right direction.

Sagacity, understanding, philosophy, quickness of yearning, and quickness of change⁽²⁾ are attributed to Mercury, which represents the first and the secret stages of the operation. An exact knowledge is required in order to understand the initial stages of the operation and to carry them out successfully. Vizierate, deliberation, and thought are attributed to the Moon, which represents the stage of the union of opposite natures.

The king from India, the wise man from Egypt and the swordsman from Persia symbolize the temperate part, the cold and moist part, and the hot and dry part of the prime matter respectively.

1. طلوع النفس مع الماء

2. مرعة الحنين و مرعة القلب

Sheikh: "These are the descriptions of this mountain and of the wonders which it contains. So understand, and know that of these hints of the Sages, he who is familiar with wisdom and adept in dark sayings and their explanation will understand the meaning. But know that if we spoke plainly we should get no credit thereby and it would be taken from us in a jesting way. So we have confided thee to thine own intelligence, after Allah (may He be exalted) Who is the best to Whom we could entrust thee. To Him be praise."⁽¹⁾

Here the statement by the Sheikh is clear and does not require any explanation, observes Jildakī.

Vol. I., Book I.,

CHAPTER IV : Explanation of the fourth section of the first part, on the likeness of the Elixir, and on analogous operations.

Sheikh: "Know, may Allah the Exalted have mercy on thee, that we began by saying, just as those before us had said, that every Art has material upon which it is based. Thus man is material for the Science of Medicine, and Medicine is based upon him. The aim of Medicine is to preserve existing health or to restore health which has been lost. Now a man when he is

1) Tr., p. 24; Es., Vol. I., p.160.

healthy has no particular need of medicine; he needs medicine only when he has become affected by a certain accidental quality, upon which the physician compounds him a remedy according to the cause, and administers it, and drives out from^{him} that accidental quality, whereupon the health which was lost returns to him.

"The remedy which is administered to the man who is lacking in health is like the Elixir⁽¹⁾ which is administered to this metallic species!"

The material of the Science of Medicine, says Jildakī, is human body, which is either healthy or sick. The physician, in order to restore health to the sick body, must know everything about the intrinsic diseases of man, and, at the same time, be acquainted with all the organs of the body, that is, to understand their internal and external structure and their functions - he can obtain this information from books on anatomy. He must then know about the diseases which afflict a particular organ, and understand their causes, their symptoms, their mildness or acuteness, and whether they are due to a simple or a compound substance. The physician must be informed also about the age of his patient and whether he has a phlegmatic, melancholic, sanguine, or bilious constitution. It is only after such

1. Tr., p.25; Es., Vol. I., pp.160, 161.

careful considerations that an able physician prepares the suitable drug and administers it, whereupon the sick body is gradually restored to health. Now, just as the physician cures the sick body, so the alchemist cures the imperfect metallic forms and restores them to their state of perfection, represented by gold. The treatment of the imperfect metallic forms is accomplished by the projection of the Elixir.

Sheikh: "Of this species, there is that which was not affected in its ore by accidental qualities, namely, gold alone; and there is that also which is so affected, like silver and the two coppers and the two leads, as has been mentioned before. So the Sages composed for these accidental qualities two Elixirs, one of them hot and red, and the other cold and white. And upon that substance whose accidental quality is coldness they project the hot and red Elixir, and upon that substance whose accidental quality is hotness they project the cold and white Elixir. And know that the Elixir of Redness is projected only upon silver and not upon anything else which is more imperfect, for the reason which we have explained earlier. So understand that passage, for natural things do not reach perfection except by degrees."⁽¹⁾

The metallic diseases are due either to the excess of heat or to the excess of cold, explains Jildakī. So the Sages prepared two Elixirs: one of them white and cold, and the other red and hot. The Elixir of Whiteness, if

1. Tr., p.25; Es., Vol. I., p.163.

projected upon the two coppers, would destroy their excessive heat and transform them into silver. The Elixir of Redness, on the other hand, when it is projected upon silver, transforms the latter into gold. In our book Bugyat Al-Habir, says Jildaki, we have dealt with the projection of the Elixir upon the two leads, and in this operation, as we have mentioned there, one could not be sure of success without taking into account certain other things. For the two leads are easily fusible and this is not compatible with the hardness of the Elixir of Whiteness. To overcome this difficulty, says Jildaki, one has to perform another operation, to which we have referred in the remaining part of this book.

Transformation of the imperfect metallic forms takes place gradually. It is like the transformation of food into blood and subsequently into flesh, nerves, etc. The food is first pounded and crushed and mixed with saliva in the mouth in order to make the ingestion easier. And after reaching the stomach it is cooked gradually and is acted upon by the powers of retention, digestion, and rejection until the most carefully chosen part of it appears in the form of blood. So, every change that we could think of, including the transformation of imperfect metallic forms, is by nature gradual. Another important thing to know is the amount of heat required to melt the imperfect metallic

minerals and the Elixir which is projected upon them.

Vol. I., Book. I.,

CHAPTER V : Explanation of the fifth section of the first part, on analogy of generation, and cultivation by seed.

Sheikh: "Know, may Allah the Exalted have mercy upon thee and help thee to understand, that the Elixir is nothing more than cultivation as in plants or breeding as in animals. Now of all species there is not one which can be produced without foodstuff, made from appropriate dryness dissolved in appropriate moisture. In plants it becomes in their roots a chyme, which is then assigned the special form characteristic of that plant species. And it is true to say that every plant species has a root, and its root a chyme, and the chyme a constitution which could not produce from that chyme other than that particular species of plant, although it be watered with the same water, reached by the same breeze, ripened by the heat of the same sun and fixed in the same earth. In the same way there cannot come from the first prime matter any form other than one particular one."⁽¹⁾

As was said before, comments Jildakī, this Art is the product of all the philosophical and theological sciences, and is, therefore, the most important among them. There is nothing on earth or in heaven, material as well as

1. Tr., pp. 25, 26 ; Es., Vol. I., pp.164, 175.

spiritual, which is not included in this Art.

Maslama b. Muḥammad al-Majrītī wrote two books on philosophy, says Jildakī, and one of them is called Ġāyat al-Ḥakīm (The Aim of the Sage). In this book, following the preface, he says that there are two advantages to be gleaned from the pursuit of the Art, one of them 'material' ⁽¹⁾ and the other magical. And he considered the second advantage to be more important, because it concerns the phenomena of the heaven, the planets, their motions and their effects on the mineral, vegetable, and animal kingdoms. Anyone who reaches to that stage in the Art, which entails understanding of all these problems, will have at his disposal the spiritual ⁽²⁾ powers which govern everything in the lower worlds, and that is why al-Majrītī called his book The Aim of the Sage. But he was not right, argues Jildakī, in describing as magical the colossal advantage which is derived from the Art. For magic is forbidden especially among the Moslem people, and one would not call, after all, a practitioner of the Art, who has attained such eminence as to rule over the spiritual powers, a magician. Magic, as the term

1. صنعية : lit : artistical, craftious.

2. مغلي

implies, deals with the subjugation of devilish powers, and therefore its productions are neither real nor permanent. It is no use arguing that there is a 'lawful' and an unlawful magic (black magic and white magic); for such contradictory statements, says Jildakī, are not permissible in philosophy. The other book of Maslama al-Majrītī is called Rutbat al-Hakīm (The Sage's Step) and it deals mainly with the 'material' ⁽¹⁾ advantage of the Art. The title of this book, like that of the previous one, is well chosen, because it is only after one has mastered the 'material' aspect of the Art, argues Jildakī, that he may be called a Sage, and it is only then that the 'keys of the treasures' come into one's possession and that one acquires the power to exert one's influence in the lower worlds, below the Moon's sphere, and in the upper worlds beyond it.

Jābir explained all these sciences, their causes, their methods, and the means which are employed to understand them. But, as we did not thoroughly understand his views and intentions, says Jildakī, and we were not in a position to pronounce our judgment upon them, so we turned to other philosophers. And we found, he goes on, that there exists a considerable difference of opinion among them with

1. As opposed to magical.

regard to the real meaning and the purpose of the Art. In fact, a number of stupid people, who confined themselves to appearances and superficialities, and who because of this lack of intelligence were not able to understand the real intention of the philosophers, particularly those of Jābir, wasted their lives and incurred heavy financial losses in the false hope of getting rich.

So Jildakī thought that it was incumbent upon him to write a number of books in order to lead the students of the Art in the right direction and help them to recover their losses. It was for this reason that he wrote his book Buġyat al-Ḥabīr (The Aspiration of the Expert) and later, Ṣams al-Munīr (The Luminous Sun) and several others. The first book deals with the ways and means employed in the study of the Art, and the second book discusses the production of the Elixir. He then chose from the works of the 'ancient and modern' philosophers, seven books, which he considered to be the best, and he began to write commentaries on them. These seven books were as follows: 1) Ṣaḥīfa (Register) of the Great Hermes; 2) Risāla (Epistle) of Buyūn al-Barhamī, which he wrote for one of his pupils; 3) K. al-Rahma (The Book of Mercy) of Jābir; 4) Ṣudūr al-Dahab (Particles of Gold) of Abū al-Ḥasan al-Andalusī (of Spain); 5) K. al-Mā' al-Waraqī wa 'Arḍ al-Najmiya (The Book of Silvery Water and Germinative Earth) of 'Ibn 'Umayl.

Ṣāhib al-Miftāḥ; 6) Qaṣīda (Ode) of 'Abū Tamām al-'Arāqī; and 7) K. al-Muktasab. Jildakī considered his present book, The End of the Search, to be the greatest of his works. He conferred, however, a similar status upon his two other books, namely, The Aspiration of the Expert and The Luminous Sun.

Jildakī then expresses the hope and desire that he may be able, with the help of God, to finish his unfinished commentaries and other books. This means that he had not finished all of them by then.

After this rather long digression Jildakī returns to the explanation of the above excerpt from the Sheikh. He considers the statement of the latter that 'The Elixir is nothing more than cultivation' to be true. For, he says, the Sages, in fact, plant their seedling in their pure earth and water it with their divine water, until it flowers and bears fruit, " and to this cultivation Ṣāhib al-Ṣudūr, may Allah the Exalted have mercy on him, refers in the rhyme of sheen." He quotes this poem of Ṣāhib with another one in the rhyme of 'seen', that is, s. The Sheikh said also that 'the Elixir is nothing more than ... breeding as in animals', and to this opinion Jildakī subscribes. He argues that there are male and female components in the Elixir. The female component becomes pregnant after marriage and gives

birth, in due course, to a child whose behaviour is very strange and everyone, noble as well as common, benefits from it, for it is extremely generous. In support of this contention also, Jildakī quotes another poem of Ṣāhib in the rhyme of zay : z.

"Now of all species there is not one," says the Sheikh, "which can be produced without food-stuff, made from appropriate dryness dissolved in appropriate moisture"; and he is right, comments Jildakī. The Sheikh has described in a few words, Jildakī goes on, the whole idea of generation, and we will try to make it clear for you. " And we say that Allah, the Exalted, deposited the secrets of generation in the simple elements, and they are water, earth; fire, and air," Jildakī explains. "Each one of these elements is different from the others in its natural form, and each one of them is capable of generation and corruption. For water transforms into stone and the stone dissolves in water; and air, when it becomes concentrated and heavy and is surrounded by cold, transforms into, and drips like water; and again water, when it is heated, transforms into air; similarly, air, when it expands, transforms into fire, and fire, too, transforms into air; and fire, when it dominates over a thing, it burns it and the smoke which results dissolves in the air."⁽¹⁾

1. Es., Vol. I., p. 171.

One important point which, I think, must not escape our attention is that Jildakī never says that base metals ⁽¹⁾ transform into gold - he says they ⁽²⁾ become gold. So it seems that for him there is a difference between the transformation of silver into gold and that of water into air. I have, however, employed the term transformation in both cases.

Qualities, though they are responsible for the transformation of simple elements into one another, are not the same as the natural forms: natural form remains unaffected in the course of transformation. The simple substances when they enter into combination, react upon one another and a contest ensues between their opposing qualities. As a result of this contest, a state of equilibrium is reached in which each quality is balanced by its opposite, and this is what is meant by combination. ⁽³⁾ In other words, Jildakī goes on, the preparation of every substance requires the

1. انقلب

2. صار

3. Es., Vol., I., p. 171-2 :

ونقول ايضا ان الكيفيات زائدة على الصور الطبيعية لان الاستحالة موجودة في الكيفيات مع بقاء

الصورة الطبيعية المشار اليها ولو كانت الكيفيات نفس الصور لامتحال وجودها مع ان

البسائط تجتمع في المركبات و يفعل بعضها في بعض با القوى المتضادة و

بكمز كل واحد منها صورة كيفية اخرى فيحصل من بين الكيفيات المتضادة

كيفية متوسطة متشابهة في الاجزاء وهي المعبر عنها بالمزاج .

action of an active entity upon a passive one; and that is why the production of food is realized by the dissolution of appropriate dryness in appropriate moisture. The food then putrifies and transforms into a chyme suitable for the constitution of the feeder, so that every species of mineral, plant or animal has its own particular chyme. The 'receptivity' of a species determines the kind of chyme which is suitable for its constitution. Different species of plants, for example, may 'be watered', as the Sheikh said, "with the same water, reached by the same breeze, ripened by the heat of the same sun and fixed in the same earth", and yet each one of them produces its own particular chyme, according to its capabilities and receptive power. Water, breeze, sun and earth represent, according to Jildakī, the four simple elements which contribute to the generation and growth of a plant. Now just as every species engenders a particular chyme appropriate to its constitution, so every chyme gives rise to a special kind of species. And for this reason the prime matter with which we are concerned begets one particular species only, and in this connexion, says Jildakī, the Sheikh cites an example:

Sheikh: "For example, soil and water form the prime matter supplied to wheat and cotton and other plants, but nothing but thread comes from the cotton-plant, and from the thread (a piece of

(1)
 cloth or) a shirt; similarly from the wheat-plant is obtained nothing but flour, and from the flour dough, and from the dough bread. In this kind of way, the conditions of plants vary, and for the following reason, namely, that the moisture of the water and the lightness of the soil particles [and the light particles of the soil] (2) change when they are enclosed in the roots [in the leaf] (3) of the plants and become chyme for a constitution [and become for a chyme a constitution] (4) such that there cannot arise from that chyme and that constitution other than that particular species of plant!" (5)

The explanation given here by Jildakī contains only one important point and that an interesting one: the rest of it is no more than a repetition of the Sheikh's arguments in different words. In fact, if he had used the copy of al-Muktasab translated by Holmyard, his comments with regard to the above quotation from the Sheikh would lose their interest. He says that the transformation of the food into chyme does not take place in the leaves of plant, but in its roots, and that the constitution of the chyme is not altered when it reaches the leaves. Moreover, he points out, the phrase 'and become for a chyme a constitution' must be

1. The part between the parentheses does not appear in Es.

2. Pt. and Es. : لطائف الاجزاء الترابية

3. Pt : عروق ; Es. : ورق

4. Pt. : وصارت كيموماً لمزاج ما لا يجئ من ذلك الكيموس ;

Es. : وصارت لكيموس مامزاجاً ليجئ عن ذلك الكيموس

5. Tr., p. 26; Es., Vol. I., pp. 175, 176.

corrected to read 'and become chyme for a constitution'. Now, does this imply that the copy of al-Muktasab used by Holmyard is more accurate than that from which Jildakī made his quotations? In the first place, the discrepancies between the two copies are very few and in most cases of a verbal nature, where for obvious reasons their occurrence was inevitable. But from what discrepancies there are, including the two cases mentioned above, it may be concluded that the copy translated by Holmyard is more accurate than that of Jildakī. For, as we shall see in other connexions, most of Jildakī's grammatical comments would have lost their significance, had he used the copy translated by Holmyard.

Jildakī rarely contradicts the Sheikh: his explanations are usually full of praise for him. And whenever he finds himself in a position to oppose the opinion of the Sheikh, he prefers, as a rule, to put the blame on the 'stupid' copyist. But with regard to the two instances of contradiction mentioned above, he does not let the Sheikh go completely unscathed. He mentions three possible causes for the mistakes which he discerned in the above excerpt from al-Muktasab. In the first place, he attributes the mistakes to the copyist especially with regard to the transformation of food into chyme, and he quotes a previous statement of the Sheikh ⁽¹⁾ which agrees with his own view

1. See p. 102 above : "In plants it becomes in their roots a chyme."

that this transformation in case of plants takes place in the roots. Secondly, he says that without having any intention of lowering the prestige of the Sheikh, the reader must be warned against believing in the infallibility of human beings, no matter how wise and learned they may be. So Jildakī considered that the mistakes might have been committed by the Sheikh himself. In the third place, he tells us that alchemists are in the habit of making intentional mistakes in their writings in order to discourage those who lack understanding, and to incite to further research and labour those who are wise and capable of discerning the truth. In this connexion Jildakī quotes a verse from Sāhib :

'If the words of the Sage were laid open,
One would suspect him to be a liar because of abounding
contradictions." (1)

Sheikh: "In the same way the reproduction of animals is nothing more than seed dropped from the male into the womb of the female and mixing with her sperm - it is like adding rennet to milk, for it curdles it - and the heat matures it, and food is added to it, and it grows and increases until 9 months are completed, when it appears in this middle world at the time assigned to it." (2)

Allah, the Exalted, explains Jildakī, has invested the

1. Es., Vol., p. 178.

2. Tr., p.26; Es., Vol., I., pp. 178, 179.

animal with the power of reproduction which manifests itself in the act of sexual intercourse, whereupon from the semen of the male, which is thick and dense in comparison with that of the female, emerges a seed. And if this seed enters the womb at the time of the female's orgasm, the sperm of the male will creep into that of the female and coagulate it, just as rennet coagulates milk. In this way a new individual comes into being, and attaches itself to the bowels of the female and is fed by its moisture until it matures and 'appears in the open space'.

The statement of the Sheikh with regard to the period of pregnancy, which he asserts to be 9 months, represents, according to Jildakī, one more example of 'referring to general while meaning the particular'. For, as we know, the period of pregnancy varies in different animals. It may be four months or less, but in a great majority of them it is between seven months and a year. It is even said that it takes a lioness seven years to give birth to a cub, and for that reason it is called 'seventh'.⁽¹⁾ No doubt the Sheikh had in mind the period of pregnancy of women, but even here, comments Jildakī, the period of nine months represents

[1] The word *سابعا* (sab'a) in Arabic means seventh and also the female of a wild beast, particularly lioness.

only the average. For a woman may give birth to a child after only seven months, or sometimes less. On the other hand, it may be ten months before she is confined. It all depends on the speed with which the generation and maturing proceed, and this is determined by Allah who assigns the time of birth.

Sheikh: "Now when food is administered to the stomach, before its arrival it is crushed by the teeth and dissolved by the saliva and becomes like dough, and only then descends into the stomach. Then if the food is very dry moisture is needed to dissolve it; and the constitution needs to drink water, and then that food becomes chyme, and the chyme a humour, and the liver attracts it by its power of attraction and matures it a second time and converts it into another chyme (and another humour)(1), and lessens its heat and converts it into a light blood. Then the mouths of the veins of the woman open, and when the blood has accumulated it appears at the mouth of the womb every month during youth when there is no pregnancy. But if there is an embryo it is fed by that light pure blood until it is perfected in the time which its Creator (may He be glorified and exalted!) has assigned to it!" (2)

Jildakī here begins his comment from a grammatical standpoint. He says that in the first sentence of the above passage, there is an erroneous transposition of

1. The part between parentheses does not appear in Es.

2. Tr., pp. 26, 27 ; Es., Vol., I., pp. 180, 181.

also. The dryness of the constitution manifests itself in the feeling of thirst which is satisfied by drinking water. So the food, after it has become dilute and soft, is cooked in the stomach by the natural heat, and at the end of this process appears as a chyme.

3) The 'coarse' ⁽¹⁾ part of the chyme passes through the intestines and is disposed of by the power of rejection. The same power drives the 'coarse' part of water into the bladder, which gets rid of it in due course. ⁽²⁾ The 'soft' part of the chyme is carried by the power of attraction to the liver where it is cooked and matured for the second time. As a result of this it is transformed into another chyme, and the liver bestows its own colour upon it. It is then divided into three parts. The first part is a 'floating ⁽³⁾ foam' called the yellow bile, and it is driven into the gall-vesicle. The second part is a dark sediment called the black bile, and it is impelled towards the spleen. The third part is a 'middling' between the first two, it is called blood and has a red colour and is driven towards the

1. کتيف

2. لطيف : It also means light, but that is the antonym of either dark (كور) or heavy (ثقیل) and not of coarse (کتيف). Moreover, as we shall see, Jildaki recognizes two kinds of blood لطيف and کتيف . Now if we translate لطيف as light it might give rise to a misunderstanding, for someone might think that he was talking about the arterial and venous bloods, but so far as the present book is concerned, he was not.

3. Es., Vol., I., p. 182 : رغوة طافية

heart.

4) "Then this chyme ⁽¹⁾ is transmitted from the heart to the fine veins which are called al-šarīya (the hair like) and al-māsārīqā (the vessels)."⁽²⁾ The 'coarse' part of the blood which is called sweat is disposed of through perspiration. The 'soft' part of it which is sticky and 'is compared to milk and dew'⁽³⁾ constitutes the food of the bodily organs. These organs attract the 'soft' blood and then a 'dubious power'⁽⁴⁾ converts it into the essence of the feeder, to make up for the wasted parts and to support the power of growth.

5) When the power of reproduction becomes active, it takes " from the essence of the pure blood connected with each organ a certain amount according to its need, and then the power of rejection drives this towards the testicles where it is bleached in the seminal vessels, and it becomes white after it has been red, it then passes through the male organ and enters the womb."⁽⁵⁾ The same thing happens to the female: the power of rejection converts the 'soft' blood into a 'dilute semen'; and when the 'two

1. Blood

2. Es., Vol. I., p. 183.

3. يشبه بالطلو والندى

4. القوة المشبة

5. Es., Vol. I., p.183.

semens' combine, as was mentioned before, an embryo comes into being. This embryo is fed on the female's residual blood or menstrual blood, which in the absence of pregnancy appears at the mouth of the womb and is disposed of by the power of rejection. Now if something happens to the embryo before it has developed enough to be born normally, it will result in abortion. The menstrual blood is 'one of the instruments of the power of reproduction' and its absence, if it is not due to pregnancy, signifies sterility.

Sheikh: "This is true only of plants and of animals and is not true of metals, for the reason which we have explained before, namely, their lack of the power of rejection, so bear that in mind." (1)

That which 'is true only of plants and of animals and is not true of metals', is, according to Jildakī, reproduction. For metals have no seeds to be sown like plants, and they are not of two opposite sexes like animals. And this is due to their lack of power of rejection, as was mentioned before. 'But the philosophers', Jildakī goes on, 'discovered that their stone is of two kinds, one of them male and the other female. So they married them together and fed them with what was suitable for them until pregnancy

1. Tr., p.27; Es., Vol. I., p. 184.

was over and a generous child was born to the couple. And it was suckled with its appropriate food until its weaning was complete, and it reached maturity and became the man of philosophy and the owner of the crown of the realm. But as the power of rejection was not included among the powers it originally possessed, it was nourished only with pure food which had no drags and no dirt⁽¹⁾s." Once again Jildakī states that just as the farmers multiply their seeds by cultivation, so do the alchemists: they reap a great deal more than what they sow. He then quotes a very long poem from Ṣāhib who describes the 'secret of reproduction' of the stone in a flowery and ambiguous language.

Vol. I., Book II.

CHAPTER I. : Explanation of the first section of the second part, concerning the qualitative part, which all other sages have concealed.

Sheikh: " Know, may Allah the Exalted have mercy on thee, that the prime matter from which the Elixir is formed is weighed from little [from little and from much] ⁽²⁾ and then is equalised, since it is compounded from dry parts and moist parts, the one of them greater than the other, in weight; then it is equalised, for the weight is compensated by the arrangement of [for the

1. Es., Vol. I., pp. 184-5.

2. Pt., and Es., : بوزن منها قليل وكثير : May mean 'from small and large'.

weight as regards the posture is divided into⁽¹⁾ three parts, one of them [which according to the opinion of Jābir expressed in al-Rūḍa (The Garden) is called Mutallat al-Kiyān (The Triangle of Nature)]⁽²⁾ single and the second of two and the third of four [make the seven quantities complete] .''⁽³⁾

Jildakī's explanation with regard to the above passage is not very illuminating. He begins by saying that he defined previously the quantity, the quality, the prime matter, matter and form, and made clear the intentions of the Sheikh. He then promises to carry out the task that he has undertaken in such a way that his book, The End of the Search, will become worthy of its title, and therefore no one would need to consult any other book.

The Sheikh says that " the prime matter from which the Elixir is formed is weighed from little and much" , and according to Jildakī this may be interpreted in three ways:
a) That the weight of the prime matter is measured with the aid of 'balance and weights'.⁽⁴⁾ For the prime matter,

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1. لان الوضع قد جرى بالوضع ثلاثة اجزاء : the part between the brackets is in accordance with the interpretation of Jildakī. He takes 'قد جرى' to mean 'is divided' and not 'is compensated'.
 2. The part between the brackets does not appear in Pt.
 3. Tr., p. 27; Es., Vol. I., pp. 188, 191, 192 : The part between the brackets does not appear in Pt.
 4. Es., Vol., I., p. 188 : بالصنع والمنابيل

(1)
 like any other 'spatial body' is divisible and one may take from it a little or much. b) That one has got the choice of two weights as regards the amount of the prime matter used in the production of the Elixir. This means that it is possible to carry out successfully the operation with 'the small weight' as well as with 'the large weight'. As to the actual amount of these two weights, Jildakī refers us to the third volume of his book where he will discuss the weight of the materials used in the operation.

c) That among 'the parts of the prime matter there is that which is small and that which is large'.⁽²⁾ Jildakī adds that the adjectives 'small' and 'large' are not absolute, but relative : the two parts are respectively 'small' and 'large' in comparison with one another.

The Sheikh says that it 'then is equalised', and by that he means, according to Jildakī, that the two parts of the prime matter from which the Elixir is formed become one after their combination, and thereafter it will be no more possible to differentiate between the small part and the large part.

But the term sawa⁽³⁾ (equal) admits of fourteen different

1. Es., Vol. I., p. 188 :

جسم منحيز

2. Es., Vol. I., p. 189.

3. The most common meanings of سوا are : equal, like, complete; equality; equity; other, else; middlepart; together; fairness; sameness; even, smooth. But it could also mean : uniform, level, flat, plane ; straight, right, direct, etc.

interpretations, says Jildakī, and he proceeds to mention them all. So he enumerates the instances of the use of the term sawa', but some of these, as far as I can see, have nothing to do with production of the Elixir. However, the fourteen instances are as follows: 1. Two lines, or more, are said to be equal when they have the same length; 2. Circles which are formed from equal 'lines' are said to be equal in size and curvature; 3. When different things combine to form one thing, it is said that they have become uniform; 4. Small and large things, when they are of the same rank, are said to be equal; 5. (omitted in the MS.); 6. Things which act in the same way and produce the same effects are said to be similar; 7. Things which react in the same way and produce the same effects are said to be similar; 8. The Sheikh may be referring to the equalization of natures after the combination of the small and the large parts; 9. He may also be referring to the equilibrium which is reached when the small part and the large part are combined, whereupon the smallness of one part is compensated by the largeness of the other; 10. Equality may imply the removal of the cause of difference which in this case results from the smallness of one part and the largeness of the other; 11. The term 'equal' may imply the soundness of

constitution and the similarity of parts; 12. The two terms 'large' and 'small' may not at all refer to the weight of the two parts from which the Elixir is produced, but to their similarity in most respects and dissimilarity in others. And after the combination of the two parts, the overwhelming instances of similarity make all the vestiges of dissimilarity disappear, and the resulting compound will be completely homogeneous. If this interpretation is correct, says Jildakī, then the Sheikh has expressed his intention by way of allegory; 13. By 'small' the Sheikh may mean fire and air, and by 'large' he may mean water and earth. These are the simple elements which put aside their differences as soon as they enter into combination with one another and thus form a homogeneous compound; 14. By 'small' the Sheikh may mean the dry part and by 'large' he may mean the moist part, so that when the former is dissolved in the latter, a uniform substance will result.

One may well say that Jildakī did not need to go to so much trouble to elucidate the Sheikh's true intention, as the latter helped more than Jildakī to clarify the matter by adding: "since it is compounded from dry parts and moist parts, the one of them greater than the other in weight; then it is equalised." But Jildakī has his own answer to such an objection. He says that "the Sheikh's purpose was to be brief but our purpose is explication and explanation.

are attributed to him, and our words
And the Sheikh's words are attributed to us."

By 'posture' the Sheikh means, according to Jildakī,
'the form which results from the ratio of some of its parts
with regard to others'.⁽¹⁾ Jildakī promises to make this
point clear later on. But one may suppose that he was
referring to the ratio between the weights of different in-
gredients which constitute a compound: for example the ratio
between the weights of the dry parts and the moist parts of
which the prime matter is composed.

The Sheikh divides, says Jildakī, the prime matter into
three parts and considers the first part to be single,⁽²⁾ which
means that it is composed of one thing only, but this does
not imply, as was mentioned before, that it is indivisible.
As regards the Triangle of Nature, it is the name given by
the philosophers to the stone. The second part consists of
two, that is, earth and water. The third part, Jildakī
goes on, consists of four, and they are the four elements or
the four natures. So, on the whole, there are seven
quantities.

Sheikh: " And each of these three has a name. The
name of the first is The Egyptian, that of the

1. Es., Vol. I., p.192 :

فاما الوضع فهو هيئة حاصلة بسبب نسبة اجزائه بعضها الى بعض .

2. Es., Vol. I., p.193.

second is The Twin, and that of the last is The Sealing Clay [The Temperate, because of its mild nature]. "(1)

The reason why the first part of the prime matter, i.e., the Triangle of Nature, is called The Egyptian, explains Jildakī, is that it contains some soft material. The Egyptian is a name applied sometimes to only one part of the prime matter and at other times to the prime matter in general. The Triangle of Nature is so called because it consists of three parts quantitatively: two of them are moist and the third is dry, and the dry part is dissolved in the moist parts. The Triangle of Nature is the name of the first part of the prime matter, but it is applied also to the stone, for the latter has a soul, a spirit and a body. The second part of the prime matter is called The Twin because of two reasons. In the first place, it consists of two things: moisture and dryness. Secondly, it possesses 'the power of adhesion'⁽²⁾ which results from its oiliness; and one may compare this adhesive tendency to the strong inclination, which twins experience towards one another. The Twin is also a name which is sometimes

1. Pt., p.21 : الطبعان ; Es., Vol. I., p. 193 :
الطبعاني لاطباع طبيعته

2. القوة القروية

applied only to the second part of the prime matter and at others to the prime matter in general, for the latter must be adhesive in order to produce unity. "The Egyptian is inclined towards coldness because of its softness,⁽¹⁾ just as the Twin is inclined toward hotness as a result of its adhesive oiliness." Again, The Temperate is a name applied sometimes to the third part of the prime matter and at others to the prime matter in general. For the prime matter in general and its third part in particular contain all the four elements in their constitution, and as none of these dominates the others, so there is a state of equilibrium between the opposing natures.

Jildakī here again emphasizes the importance of observing secrecy in the Art. He tells us that he endured a great deal of trouble and spent many years in order to become initiated into the Art, but he does not find it possible to reveal all the secrets, for the philosophers, one and all, are bound by a vow against undesirable disclosure. So the reader is left to himself, and to himself alone, to try to understand the hidden parts of the Art. If he is successful in his attempt, he must in turn observe the rule of secrecy and refrain from divulging the hidden parts.

1. On many occasions Jildakī uses the terms softness and moistness as synonyms.

Sheikh: "As for the weight of each one of them, verily, that of the Sealing Clay [The Temperate] is one part, that of The Twin is half a part, and that of The Egyptian is $2\frac{1}{2}$ times as much as that of the Sealing Clay. [The⁴ Temperate]. Thus it is from little and from much and then is equalized!" (1)

The explanation of Jildakī with regard to the above passage contains nothing of importance. The only thing worth mentioning is that he considered the numbers 1, $\frac{1}{2}$, and $2\frac{1}{4}$ to be the ratios between the weights of the three parts of the prime matter from which the Elixir is formed. In this connexion Jildakī quotes three short poems from Ṣāhib, including the following tetrastich:

"I am surprised at him: a son who is a husband for his mother,
For her from him masculinity and from him^{for} her femininity,
And for mother two-thirds of his body and^{he} half of it, (2)
And for father from him its half and he the one-third!"

This is a word for word translation of the Arabic original, to demonstrate the ambiguity of the poems of Ṣāhib.

1. Tr., p.27; Es., Vol. I., pp. 195, 196.

2. واعجب به ابنا كان زوجا له
فلا لم نلنا جسمه وهو نصفه
ببها منه تذكرو منه بها خنت
وللابنه نصفه وهو النك

Vol., Book II.

CHAPTER II : Explanation of the second section of the second part, on the method of beginning, which they kept secret from all men.

Sheikh: "Know, may Allah the Exalted have mercy on thee, that the manner of beginning is hidden within the Gate of Knowledge. The prime matter prepared for the operation of the Elixir cannot be introduced into that (metallic) species the reproduction of which you desire, except after the dissolution of its combination and its separation, so that the inappropriate accidental quality may go out of it, as has been explained before!" (1)

Jildakī begins his explanation here with a quotation from Hermes: "You toil constantly during the night until the morning dawns and by then you have produced pearls and silver, and when the sun rises you have produced rubies and gold." (2) And Hermes was asked: "When will that happen?" "At the time when day and night become equal", he answered. What Hermes meant by 'night', according to Jildakī, was deviation, impurities which hinder combination, inappropriate accidental qualities, and the first blackness which indicates marriage and combination. By 'day' he meant guidance, freedom of 'natures' from turbidity, and stability. By the rising of the sun he meant the completion of the process of production of the Elixir, and this takes place when day

1. Tr., p.27; Es., Vol. I., p. 198.

2. Es., Vol. I., p. 198.

and night are equal. One of the sages has said, Jildakī goes on, that "If you desire to rise to eminence, direct yourself towards the philosophers' mineral and take from it an elixir, one-and-a-half part of it, and expel from its natures the gurāb al-bayn,⁽¹⁾ in order to complete its usefulness, otherwise there is no success!" Jildakī leaves this quotation unexplained and returns to the Sheikh's statement. He says that the philosophers have described in their books all the operations with the exception of the manner of beginning, or the preliminary part, which is hidden in their breasts. Whoever passes through the Gate of Knowledge will have access to it, but under no circumstances must he divulge it. For God has forbidden such a disclosure, and anyone who fails to obey Him will go in fear of his life.

The prime matter, continues Jildakī, from which the Elixir is formed is not pure, and that is why it lacks the tinctorial power before the operation. The properties of the Elixir are only potentially present in the prime matter, and it is after the removal of impurities, by operation, that they appear in actual form. This operation consists

1. غراب البين : A kind of magpie with red legs and beak. Lit., the raven of separation, so-called because its appearance was supposed to predict separation between friends.

in dissolving the prime matter and splitting it into its elementary parts in the special manner of the philosophers. After the dissolution it is possible to remove all the inappropriate accidental qualities and to project the Elixir, which is thus produced, upon the metallic species.

Sheikh: "Therefore the dry part of the prime matter is taken, by the weight above mentioned, [and the moist part is added to it] (1) and the two are well mixed by pounding and placed in a vessel and allowed to remain until the moistness has united with the dryness as water unites with wine. The substance is then placed in a distillation apparatus and separated several times until the moisture has performed upon the dry part the action of fire upon wood; for the sayings of the philosophers is correct that 'Its water is its fire'.

" The dry part becomes converted into a calx in the form of a uniform dust; and the moisture separates on one side and the dry on another. This is the end of the method preceding the two parts of the first operation and the two parts of the second operation." (2)

Before explaining the above passage, Jildakī finds it useful to acquaint us with the views of some other sages, particularly in connexion with 'the preliminary part'. He also promises to tell us more, at the end of the third volume

1. The part between the brackets is added in the course of explanation: Es., Vol. I., p. 211.

2. Tr., pp. 27, 28; Es., Vol. I., p. 201.

of his book, about those parts in the Art which the Sheikh kept secret.

He quotes Muḥammad b. Umayl, who in his book Miftāḥ al-Hikmaḥ al-'Uzmā (The Key to the Supreme Philosophy) states that the sages are all on their oaths against revealing the 'preliminary part' except by scattered hints, which suffice for the intelligent person to draw his own conclusions.

Jildakī then says that at the beginning, only two of the four natures existed. They were 'hot' and 'cold' which followed one another in circular motion. Then 'hot' dissolved the 'cold' and as a result of this 'dry' and 'soft' (wet) came into being. 'Dry' attached itself to 'hot', and 'wet' attached itself to 'cold', on account of their similarity. The four natures subsequently gave rise to all the species in the three kingdoms. Jildakī asserts that the number of kingdoms was later increased to seven, and he attributes to 'hot' the most prominent place among the natures. 'Hot', he says, is the oldest and the most active nature.

"The sages imitate in their operation the process of nature in the generation of the world." This statement of Jildakī supports the view that the alchemists were, at least in principle, practical people and assiduous students of nature. In their attempt to produce elixir, the sages,

continues Jildakī, came across the stone which they found to be the only substance in potential possession of the desired properties. So the sages tried to convert the potential properties of the stone into actual ones, that is, to lay open the inner parts of the stone and let it display its hidden qualities. Hermes was once asked to give the definition of the Art, and he answered: "It is to make apparent what is hidden and to hide what is apparent."⁽¹⁾

"And know", comments Jildakī, "that fire and air are hidden in essence and form; they are apparent only through their effects. Water and earth, on the other hand, are apparent in essence and perceptible to the touch and eye. Earth and water predominate in the Art at the beginning, but in the end air and fire become predominant. And this is what the sages meant when they said: 'Those with bodies lose them, and those without bodies obtain them'. That is, the bodies become souls, and the souls become bodies. And bodies do not become souls unless they are dissolved in the desired, philosophical manner. And souls do not become bodies unless they are coagulated in the desired, philosophical manner. And all this concerns the first operation from the beginning to the

1. Es., Vol., I., p. 204.

end, including the first dissolution which is kept secret."⁽¹⁾ Jildakī then argues that the dissolution which the philosophers, Hermes for example, have described in their books is not the one which is carried out at the beginning: it is the one which follows 'the marriage'. He adds that the 'extraction of spirit' which accompanies the first dissolution is temporary; for the spirit returns shortly afterwards and the final extraction takes place only after 'the marriage'. "And one of the sages asked his teacher: 'Is there another operation before this one?' He said: 'Yes, pour water on earth and you will discover that the latter will dissolve in it and putrefy by it.' And to this Ṣāhib al-Ṣudūr has referred (in one of his poems)."⁽²⁾ The poem of Ṣāhib quoted here concerns the first operation, but, as usual, does not help to make the meaning clear.

With regard to the importance of the first dissolution, Jildakī invokes the words of 'one of the sages', who said: 'If there is no dissolution at the beginning, there will be no coagulation at the end.' He then quotes Jāmāsif al-Ḥakīm who said that 'Mercury and sulphur are gold in their nature, and mercury is the origin of all bodies'.

1. Es., Vol. I., pp. 204-5.

2. Es., Vol. I., p.205.

The latter describes the transition of mercury from one state to another until it displays the colour of gold, and that is, he says, 'at the time of resurrection beyond which there is no death and no imperfection'. In this connexion Jildakī gives rather lengthy quotations from Jābir. The latter, according to Jildakī, writes in his K. al-Zaybaq al-Ġarbī (The Book of Western Mercury) : "The western mercury is considered by the sages to be the soul, for it is cold and moist. It is also the divine water, since it liquefies the parts and prevents fire from burning. Its coldness is due to its whiteness and to moisture, for it is a water, and every water is cold and moist. Some of the sages have said that it is dry, for it does not respond to the smelting-fire, and in comparison with the oil it is actually dry. Some other sages have stated that it is moist, and what they meant was that the tincture will not penetrate unless it is dissolved in it."⁽¹⁾

The next quotation from Jābir, which is followed by a tetrastich from Ṣāhib, is not very illuminating. But the quotation which comes after, is full of interest. "Mercury," he says, "is the soul and there is nothing of the same status in the world. It is the living soul which on mixing

1. Es., Vol. I., p.207.

with body animates it and transforms it from one state to another and from one colour to the next. It is the water of life and the spring of vitality from which whoever drank never died. And it is that which after its extraction, perfection, combination, and completion of its generation, (1) does not give the observer a clue as to with what it is mixed. But it keeps off the heat of fire and prevents it from burning the substance with which it is mixed, and for this reason it is called the Eterniser of bodies (or the Most Eternal among bodies), (2) for it makes them to be stable in fire, after they have been inflammable. And know this and discern the meaning therein, so that you may reach to that which the former philosophers have kept - I swear by my master - secret in the divine Art. And that is, indeed, the major operation, (3) without which nothing would ever be possible." (4) "And understand," comments Jildakī, "the words of this learned teacher whose eminence, in theory" as

1. امر : lit., affair.

2. خالد الخلود، في الاجساد

3. الباب الاعظم

4. Ibid., p. 208-9.

well as in practice, has not been matched by anyone, either those who preceded him or those who came after him."⁽¹⁾

The sources of Jābir's knowledge, according to Jildakī, were three: a) his own remarkable intelligence; b) the writings of former philosophers, Greek and others, which he examined thoroughly, mastering all their contents; c) the teachings of his great and trustworthy contemporaries, particularly his master Ja'far al-Ṣādiq, the sixth Imam of the Shia sect. Jildakī states that Ja'far al-Ṣādiq excelled in every branch of knowledge. Adulation of Ja'far al-Ṣādiq was not confined to Jildakī, for quite a number of Muslim authors regarded him as a very learned man. But in spite of all this, a closer examination of the subject would convince one that the eulogies pronounced on the sixth Imam were mainly due to religious fervour.

Returning to the interpretation of the Sheikh's words, Jildakī makes extremely interesting remarks, propounding the idea of definite reacting weights. Referring to the statement of the Sheikh, that 'the dry part of the prime matter is taken, by the weight above mentioned', he comments:

"The dry part is that which he denominated The Twin, and it is taken by the weight mentioned, i.e., by a perfect

1. Es., Vol. I., p.209.

measure, for the quantities which react in the operation are definite."⁽¹⁾ Jildakī adds that, though it is possible to perform the operation with the 'small' or the 'large' weight, this does not imply that in the Art operations are carried out fortuitously. To clarify the matter, he gives an example. It is possible, he argues, to make bread from a bushel of wheat. But, if one takes only ten grains of wheat, considering the amount of waste in the processes of pounding, kneading, and fermentation, it is extremely doubtful that there will be left anything for baking. The grains of wheat, he compares to points. A point has no dimension, but line, surface, and volume result from conglomeration of points. So it is with the grain of wheat, a great number of which go to make a bushel.

Jildakī then makes a very important statement as regards the ratio between the weights of the substances which form a mixture or a compound. "The original weights," he says, "are, indeed, related some of them to others - this is the ratio of mixture, and combination - (in such a way as) to equilibriate the natures."⁽²⁾ The relative weights which are needed in the operation, Jildakī continues, are those

1. Es., Vol. I., p.210 : الجزء الباس هو الذي سطر بالتوأم فيؤخذ بالوزن المذكور له مقدار تمام لان المقادير التي تقبل التدبير معلومة .

2. Es., Vol. I., p.210 : فان الاوزان الاصلية منسوب بعضها الى بعض نسبة الاختلاط والتركيب لتعديل الطبايع .

which establish a balance between the 'agent' and the 'counteragent'.

The moist part which is added to the dry part "is that", explains Jildakī, "which he called The Egyptian, and its weight is the weight mentioned above."

Would it be possible to conclude from all this that the Law of Constant Composition was, at least in its rudimentary stage, understood by the Muslem alchemists of the Middle Ages? There is no doubt that the language of Jildakī with regard to the definite weights of substances forming a compound is free of ambiguity. But the evidence at our disposal, I think, is scanty and does not entitle us to jump to a hasty conclusion. Perhaps what Jildakī had in mind was the minimum practical weight of a substance, as his analogy of the grains of wheat would show, that could be handled after the amount of waste in the course of operation is taken into account. Again, we do not know whether the same weight of the same substance was used in all operations, or whether it was changed according to the kind of compound which the alchemist desired to prepare. It is in the third volume of his present book that Jildakī dwells more upon the subject of weights, and it is therefore appropriate to cut short our discussion of this point

(1)
until then.

The mixing of the two parts by pounding, to which the Sheikh refers, is called the 'first mixing' and takes place, according to Jildakī, before the formation of The Twin and The Egyptian. This contradicts the two previous statements of Jildakī that the dry part is The Twin, and that the moist part is The Egyptian. It is only, Jildakī continues his explanation, after the transformation of the 'simple matter' into the prime matter, that the three parts of the latter appear in their distinct forms and are given special names.

The Sheikh divided the 'first, concealed operation', into two parts. The part that he mentioned, 'and we are going to explain', is that which is nearer to 'marriage'. He did not say anything about the second part, 'and we shall explain it at the end of our present book' in the chapter devoted to problems concealed by the Sheikh. But Jābir, Jildakī goes on, referred to both parts of the first operation, yet in an allegorical way which is only understood by those who are proficient in the Art. And all other sages imitated him in this respect and did not proceed further than giving certain gentle hints. As to Jildakī himself, his intention was to leave nothing untold about the Art

1. Most probably what Jildakī had in mind was The Theory of the Balance of Jābir; Cf. Kraus, Jābir b. Ḥayyān, Vol. II, Cairo, 1942, pp. 187-303.

in his present book, so he dispersed his explanations, as regards the concealed parts, in different places; and anyone who cares to collect them and bring them together will understand their meaning.

To mix the two parts adequately, Jildakī recommends the use of a stone-pestle. He invokes the authority of Zosimos who in his Muṣḥaf al-Ṣuwar (The Book of Forms) considered the addition of ṭabī^ea (nature) to be essential to a successful mixing. Jildakī presumes that by 'nature', Zosimos meant 'heat and moisture' and not, as a great number of the students of the Art' have thought, heat alone. He also refers, in connexion with the process of mining, to K. al-Rahma al-Ṣagīr (The Small Book of Mercy) of Jābir, to a poem of Ṣāhib, and to Māriya (Mary the Jewess). He quotes Mary as saying: "If you heard in our books of calcination, or dilapidation, or striking, or dissolving, or volatilization, (know that) they are all one and the same thing, i.e., the maceration of natures in their water."⁽¹⁾ When the natures are macerated in water, comments Jildakī, they unite with each other, just as water unites with wine, and this is similar to the dissolution of the dry part in the moist

1. Es., Vol. I., p. 214 :

وقالت مارية اذا سمعتم في كتبنا تكليما او هدا او ضربا او تحليلا او تصعيدا فهو جميعه
شيء واحد وهو نفع الطبائع في ما فيها.

part. "And no doubt wine, on account of the ponderosity of its essence, is denser and heavier than water; and when they are mixed, the constitution is balanced between them."⁽¹⁾ So Jildakī thought that wine is heavier than water.

The Sheikh did not mention, continues Jildakī, how many times the substance must be 'separated' in the distillation apparatus, but he remarked that the operation must be stopped just after 'the moisture has performed upon the dry part the action of fire upon wood', and that is when 'the dry part becomes converted into a calx in the form of a uniform dust'. Jildakī then proceeds to give numerous quotations, mainly in connexion with the first operation, from a great number of savants and alchemists including Hālid b. yazīd, King Theodorus and Ares, Hermes and his son Tātā (Thoth), Jāmāsif, Galen, Jābir, Ibn 'Umayl, Ṣāhib al-Šudūr, King Heraclius, Rāzī, and others.

Hālid in a poem states that the first operation in the Art is 'calcination', which is carried out by the aid of an intense fire, similar to that of hell, and it takes seven days. After that comes the 'evaporation of water', which

1. Es., Vol. I., p. 214 :

ولاشك ان الخمر اكف واثقل من الماء لنقل جوهره فاذا اختلط الماء بالخمر
اعتدل المزاج بينهما.

is continued 'until you see it white like the moon', and 'that is the clue which men desire'. What Hālid meant by 'calcination' was, comments Jildakī, dissolution, the one which takes place before 'marriage', and not the other which comes after. 'And I declare', Jildakī goes on, "that the dust-like dryness which is uniform is copper and 'ābār,⁽¹⁾ and it is the bleached sulphur. And gold is the hot and dry masculine, the easterly youth, the rock, the yolk of the egg, the lime of the shell, and the like. But the water which is extracted from it is the dissolved mercury, the cold and moist feminine, The Egyptian, the white of the spherical egg, the dissolved talc, the salt water, the sharp water, the silvery water, the solvent water, the mihrī water, and the like."⁽²⁾ This and other statements of Jildakī, together with the quotations which he gives from other authors with regard to the first operation, shed very little

1. **أبار** : It is sometimes used to indicate tin (**فصلوير**) and at other times lead (**أصب**). See *Index*.

2. Es., Vol. I., p.216: **واقول ان البيومة المتهبية التي لاجزء لها هي النحاس والابارو هي الكبريت المبيض والذهب و هو الذكر الحار البابس والفتى الشرقى والصخرة و صفرة البيض و كلس القشروا شياء ذلك واما الماء الخارج عنها فهو الزبيق المحلول والانتى الباردة الرطبة والمصرية و بياض البيض المدور والشكل والطلق المحلول وماء الملح وماء الحار والماء الفضة والماء الحلال والماء المهرى وشبه ذلك.**

light on the subject.

"King Theodorus, referring to the first operation," asked Ares whether the 'first death' was similar to the 'second death'. The latter answered that it was not, for the first death is caused by the lack of moisture, while the second is due to the extraction of hot, moist and tinctorial water. After the extraction of water, there remains the body with its hot, dry spirit. This is watered with the 'water of life', which is cold, moist and white. They are then separated by the action of fire which, at the same time, causes coagulation or solidification, "and this is the solidification of mercury in the body of magnesia".

"And Hermes, peace be upon him, said to his son Thoth", that 'mercury is the water of all these essences and it does not mix with anything' which is not appropriate for it. But when mercury is made fluid like water, and is then projected upon the melted body, it dissolves the latter and coagulates it and transforms it from one state to another until the desired state of silver and gold is reached.

"And 'Amīr Ḥālid said, " that the dissolution of 'the feminine stone of the philosophers' in 'the water' is the clue to the secrets of the Art.

'And Jāmāsif al-Ḥakīm said", that, according to the Sages, by the action of fire upon 'this essence' a moisture

is extracted which penetrates the 'bodies', just as poison penetrates animal bodies; and it burns them, in the same way as fire burns wood, and it disintegrates them: 'at the bottom' appears 'the ash and on top a dragon which is eating its tail'.

" And Galen said in his treatise," that 'the purpose of rendering the body fine by the water'⁽¹⁾, is to derive from it the stone, for the latter is produced as a result of the coagulation of 'the pure water'. And when 'that earth' is dissolved in 'the water', a sediment is left over; and if this is dissolved again, after the separation of 'the divine water', it will appear in the colour of glass or wax, 'resembling the spirit'.

" And King Theodorus asked Ares", whether the two 'adhesions' are the same or different. The latter answered that they are different: the 'first adhesion' concerns the dissolution of 'the body' in mercury, while the second relates to the action of mercury on the surface; it is 'the second adhesion' which is called 'the first operation'.

"And I declare that the material of the stone exists in the world" - Jildakī breaks the chain of quotations from other authors to give his own opinion - but, "as we described

1. نالطيف الجميد بالماء

for you before," it must be made free from impurity in order to become suitable for the operation. Jābir has referred to this, Jildakī continues, in his K. al-Zaybaq al-Ġarbī (The Book of Western Mercury), included in his 500 Books, and also in his K.al-'Arba' (The Book of Four).

"And Jābir said in his K.al-'Istitmām (The Book of Completion): "Things do not dissolve unless they are putrified, and they do not putrify unless they are kneaded, and they may not be kneaded except by the appropriate moisture of their own kind, and by the consumption of the nature ⁽¹⁾ (suitable) for them, for a long time exceeding the period of nursing (a child). And so they emaciate and become tender by its heat (the heat component of 'nature'), and its moisture (the moisture component of 'nature') extends to their depth and mixes with them and flows in the midst of their minute particles. Consequently they are kneaded, putrified, liquefied, and then turned into a distilled water. And this is the realization of our purpose as regards its

1. الطبيعة : lit : nature; temper, constitution. Jildakī (see p.140, above) thought that it consists of heat and moisture, and the above quotation from Jābir confirms his opinion.

dissolution!"⁽¹⁾ After praising Jābir, and laying emphasis on the importance of his views, Jildakī continues to give a few more quotations.

"And Galen the Sage said" that the object is to obtain the stone and then divide it into two equal parts : coagulate the one and liquefy the other. 'The body' is then rendered fine and transformed into a spirit by the water which is derived from the stone. This will increase the speed of combination at the end of which the spirit thickens and becomes dense, while the 'solid part' becomes tender and fine.

"And Ibn. 'Umayl, may Allah, the Most Exalted, have mercy on him, said in K. Miftāh al-Hikma al-Uzmā (The Key to the Supreme Philosophy), when he testified to the correctness of the statement, attributed to Galen and mentioned above, " that the latter was referring to the 'three operations'. These consist of distilling the stone in the distillation apparatus, and then 'marrying' the earthy part, which is left

1. Es., Vol. I., p. 219 : وقال جابر رحمة الله في كتاب الاستتمام
الاشياء لا تنحل حتى تعفن ولا تعفن حتى تتعجن ولا تتعجن الا برطوبة تشاكلها
بالجنسية وبانهاك الطبيعة لها اياما كثيرة اكثر من ايام الحضان حتى تنمى بحرارتها
ولطفها وتصل رطوبتها الى شعورها وتمازجها فتسرى في اجزائها الصغار فتعجنها و
تعفنها وتسيلها وتصيرها حينئذ ما قاطرا وهذابة مطلوبنا في حله .

over and constitutes half of the stone, to the part which is evaporated, and finally 'marrying' both of them to the spirit.

"And Jābir said", that 'the earth' requires up to ten parts of the water, and this must be derived from another stone and then poured on it.'

Jildakī then enumerates the fifteen successive stages which must be observed before the desired end in the Art is reached. These stages are as follows : 1. Investigation of the properties of the raw material of the stone; 2. Examination of the prime matter employed in the production of the stone; 3. Examination of the parts of the prime matter; 4. Investigation of the properties which all parts of the prime matter must possess before operation; 5. 'To study the action and reaction of every part of the prime matter : how it is produced and into what it is transformed'; 6. Investigation concerning the combination of some prime matters with others: how this is done and what will be the outcome; 7. To study the principles and the details of the first, concealed operation; 8. Investigation concerning the 'first marriage'. This is the middle stage to which al-Ṭuḡrā'ī refers in his verse: 'They described their operation from the middle, And omitted the beginning of the process'; 9. Investigation concerning the separation and its

completion; 10. Investigation with regard to purification and its completion; 11. Investigation concerning the first combination which represents the completion of 'the first, unconcealed operation'; 12. Investigation concerning the second, unconcealed operation, which represents the completion of the production of the Elixir; 13. Investigation concerning the projection of the Elixir; 14. Investigation concerning the manner of multiplying the amount of the Elixir; and 15. Investigation concerning: the secret of fermentation in the production of the Elixir, the weights, the intensity of 'the two fires', the apparatus used in the Art, etc.

Jildakī says that all these stages have been fully described in his present book. With regard to the first concealed operation, to which the present chapter is devoted, he emphasizes again that, though none of the philosophers, 'particularly the old pre-Islamic philosophers', referred to it except in enigmatical terms, he would try to give as many gentle hints as possible, to enable the intelligent person to come to the right conclusion.

Jābir mentioned, says Jildakī, the first, concealed operation in many of his books. His descriptions are intentionally obscure and consist of mutilated statements scattered in many different places. The fullest descriptions are to be found in his LXX Books, where he gives peculiar

names to it, such as 'The Sea Physician'.⁽¹⁾ But there is nothing, according to Jildakī, in the writings of the philosophers, like Rāzī, Ṣāhib and Ibn Umayl, who came after Jābir, that concerns 'The Sea Physician' or other allegorical names employed by Jābir. Jildakī then proceeds again to give us more information about the first, concealed operation.

The dry part of the stone, he says, is hard and earthy, it is potentially, and to some extent actually, tinctorial, and in its interior there is a 'hidden fire'.⁽²⁾ To the dry part is then added 'the fiery moisture',⁽³⁾ which ultimately transforms the former into a white, soft and dry powder, capable of resisting the fire. The moist part of the stone is also treated with heat and moisture until it is transformed into 'a watery, nay, a penetrating

1. Cf. Kraus, Jābir Ibn Hayyān, Cairo 1942, Vol. II., p. 90-3.

2. النار الكامنة

3. رطوبة النار : I believe this is the same as (al-ṭabīʿa : the nature) which was mentioned before and had two components, heat and moisture.

(1)
oil.' The two parts "are then mixed, each by a particular weight, and subsequently separated, seven times, in the distillation apparatus. And thus concludes the preliminary part and the first concealed operation, in consequence of which the dryness is removed to one side and the moisture to another: they are the masculine and the feminine."

Jildakī points out that the method, as described by him, of carrying out the first concealed operation, though the most perfect, is yet by no means the only possible one. There are other methods, some of them easier than others; they differ also in effectiveness, but all of them lead to the same thing. To make his point clearer, Jildakī resorts to analogy. A city, he says, has various gates, there is that which is the largest and that which is the smallest. One gate leads to the king's palace, another to the house of the judge, another to the house of the philosopher, and so forth; but all of them lead to the same city. "And since our purpose in this book was to explain the words of Ṣāhib al-Muktasab (The Author of al-Muktasab), it was not possible for us to deviate from the method which he employed and turn to another. Nay, we rather describe in like (lit : this)

1. Jildakī's description with regard to the treatment of the two parts of the stone with heat and moisture and the reactions which this operation involves, is extremely ambiguous. The above is a brief account of the more intelligible part of his description.

manner things which are to the point and intersperse among them decisive arguments and matters which we consider to be important and full of interest, so that anyone whom Allah has made worthy of it may benefit therefrom!'⁽¹⁾

Referring to the method employed by the Sheikh, as well as by other alchemists, in the exposition of the Art, Jildakī remarks that 'the Sages' were in the habit of giving different names to the same substance and of alluding to the 'particular' while meaning the 'general', or vice versa.⁽²⁾ For example, they gave to the stone four names: 'matter', 'prime matter', 'egg', and 'the stone'. The reason for the plurality of names in this case, was, according to Jildakī; that the alchemists thought that to understand 'the matter' is to understand 'the prime matter', and to understand the latter 'is to understand the prime matter of everything liable to formation; and to understand the egg is to understand all the creatures born in the three kingdoms.' And after understanding all this, Jildakī goes on, one has to consider how things pass from one grade or position to another. This will

1. Es., Vol. I., p. 224-5.

2. "The interpretation of alchemical terms was always elastic." (John Read, The Alchemist, Edinburgh, 1947, p.5.)

enable him to deduce 'the unknown' from that which is 'known', i.e., to understand the stone. For the knowledge about the stone, as expressed in the books on alchemy, is not and could not be explicit. Jildakī then proceeds to conclude the present chapter by giving a few more quotations from the Sages on the first, concealed operation.

'And said one of the Sages' that the properties of the stone will become manifest only when it has been made soft and has been stripped of all its impurities.

'And said some of the Sages to Hermes, peace be with him : 'Oh generous teacher, what is wrong with us? We tincture but our hues abscond.' And He answered: 'How can you expect your tinctures to be permanent, if you do not salt the sea and do not make Hermes free from responsibility and do not project the calx upon water, so that the water may become stable, strong, solid, and is prevented from evaporation.'⁽¹⁾

"And said Heraclius : 'Prevent the water from evaporation, and the oil from burning.'⁽²⁾

1. Es., Vol. I., p. 226 : و قال بعض الحكماء لهرمس عليه السلام
بما علم الخبير ما بالنا تصبغ فتفر اصباغنا فقال وكيف لا تفر اصباغكم وانتم لا تملحون البحر
ولا تحللون هرمس ولا تلقون الكلس في الماء حتى يثبت الماء ويمتنع من الفرار و
يلزم وجمد .

2. Ibid., p.226.

"And Jābir said in his K. al-Rahma al-Ṣagīr (The Small Book of Mercy), " that one must choose his material fresh, tender, and free from impurities. It is like taking the yolk and throwing away the other parts of the egg. "And have confidence", remarks Jildakī, "in the words of the Sage (i.e., Jābir), (for) fire increases the goodness of the good and the badness of the bad."⁽¹⁾

"And said King Heraclius", after recommending the reader not to divulge anything except to learned men, that one has to prevent 'the water' from evaporation and 'the oil' from burning, and to remove 'blackness' from 'bodies'. One could then 'marry' them in the aludel and procure the 'eternal water'. Jildakī quotes Heraclius again as saying that 'the volatile water' is made stable by mixing it with 'the solvend waters',⁽²⁾ just as 'the volatile spirits'⁽³⁾ are fixed by 'the solvend bodies'.⁽⁴⁾

Jildakī concludes this chapter with a poem from Ṣāhib,

1. Es., Vol.I., p.227 :

- واعتمد على قول الحكيم النار تزيد الصالح صلاحا والفاقد فسادا .
2. المياه المحلولة
 3. الارواح الفرارة
 4. الاجساد المحلولة

and he attempts for the first time to interpret some of the verses. He says, for example, that the following verse:

'She and I' were so wrapped together in passion,
like the water of cloud and coffee.' (1)

has the same meaning as the statement of the Sheikh that "the two (the dry part and the moist part) are well mixed by pounding and placed in a vessel and allowed to remain until the moistness has united with the dryness as water unites with wine." In short, Jildakī believes that this poem of Ṣāhib is the sum and substance of everything mentioned in the present chapter.

Vol. I., Book II.

CHAPTER III : Explanation of the third section of the second part, on the first part of the first operation.

Sheikh: "Know, may Allah the Exalted have mercy on thee, that the method which has been described is the base and the foundation and secret matter without which the Art will not succeed for anyone (2) [without which the Art will

1. Es., Vol. I., p.229 :

كأنَّ مَعَامَاً القمامة والقهى

فكنت وابلها وقد لفنا الهوى

2. Pt., p.22 : احداً ; Es., Vol. I., p.229 : ابداً

never succeed].⁽¹⁾

Every art, scientific as well as manual, explains Jildakī, ought to have a sure foundation on which its whole edifice rests. And the concealed operation constitutes the foundation of the Art. "For (in the Art) there is no operation without matter, and no matter without equilibration, and no equilibration without balance, and no balance without proportion, and no proportion without relation, and no relation without soundness, and no soundness without generation, and no generation without result, and no result without science."⁽²⁾ And the concealed operation, Jildakī goes

on, may not be carried out except by the use of 'the pure water'⁽³⁾ which is the same as 'the acrid, solvent water'.⁽⁴⁾

"The Sages have related many parables for us about the sharp waters";⁽⁵⁾ they have also referred to 'the Triangular water and the Mihri poison',⁽⁶⁾ in connexion with the extraction of

1. Tr., p.28; Es., Vol. I., p.229.

2. Es., Vol. I., p.230 : لانه لا عمل الا بمادة ولا مادة الا بتعدد بل و لا تعد بل الا بميزان ولا ميزان الا بنسبة ولا نسبة الا بمناجبة ولا مناجبة الا بصلاح و لا صلاح الا بكون ولا كون الا بنتيجة ولا نتيجة الا بعلم .

3. ماء القراح

4. ماء الحريف الحلال

5. مياه الحادة

6. الماء الثلث و السم المهرى

tinctures, and they have, indeed, benefited from all. But one has always to be careful, so as not to be deceived by the apparent meaning of the words. Jildakī quotes the following verse from Ṣāhib, concerning the acrid water.

"We have a world from whose earth was originated its
 water,
 And from its water and the fire, was originated its
 air!" (1)

In this verse Ṣāhib refers, according to Jildakī, to the first, concealed operation, and to "the extraction of the stone's water from its earth"; he also refers to the second operation, "for the generation of the air takes place only at the time of fermentation and combination of the Elixir".

The Sages, says Jildakī, have recommended the addition of over two parts of 'the pure water, which 'has no heaviness' to one part of the stone. 'The product is then distilled in the distillation apparatus for seven days until "the sign appears and the concealed operation is complete".

Sheikh: "Then the dry part is taken and to it is added the moist part in a weight equal to one part of the "Sealing Clay" [of the

1. Es., Vol. I., p.230 :

ومن ماء والنار كون هواه

لنا عالم من ارضه كون ماءه

Temperate - and it does not combine with (a weight) other than that -] (1) and the two are well mixed by pounding until one has mixed with the other as water mixes with dry crumbly clay." (2)

The dry part, explains Jildakī, is called the masculine, and the moist part is to be interpreted as the feminine. "By the 'dry crumbly clay' is meant the soft dust calcined by the heat of the sun. And when the water is added to this dust, it foams with rage and then subsides and becomes like clay. For the dry crumbly clay when it mixes with the water undergoes a transformation, and the form of the clay is between the water and the dust. So the colour of the compound instantly undergoes a change towards black, and one smells the odour of semen, and that indicates marriage. And this is the first combination which results in dissolution and the emergence of colours in the water, and with this combination the constitution becomes complete. It is analogous to the discharging of the sperm and its combination with the semen of the woman. And this is the beginning of putrefaction, nourishment, and generation. Now, if there is

1. Pt., p.22 : الطبعانى

Es., Vol. I., p.231 : الطبعانى ... ولا مزاج بنغيرها

2. Tr., p.28; Es., Vol. I., p.231.

an excess of fire it will cause divorce and separation, while a gentle fire assists the process of generation and strengthens the natural heat which is the cause of life. And this fire must be veiled, and a condition (to be observed) is that it should reach the compound equally from all sides and not less from one side than the other. It is like taking a bath with lukewarm water which is pleasant to the body. One of the signs of its adjustment is that, if you put your hand on the vessel, you shall find it agreeably hot. And do not run away from it, for it indicates the just proportion of its fire. This is after you have appropriately pounded it, and have smelt its odour and seen its colour; then you become convinced that you have been definitely right.⁽¹⁾

Sheikh: "Next, place it in the vessel called the 'amyā⁽²⁾, seal the joints of the latter with luting clay, and place it in a vessel in the hollow of a cauldron upon ashes; then keep a gentle fire kindled underneath day and night until the moist has combined with the dry, and blackness appears. This is the sign of fertilization and dissolution, that is, the indication of the dissolution and union of the moistness and the dryness, volatilising with it when it volatilises and entering with it into combination when it enters."⁽³⁾

1. Es., Vol. I., pp. 232-3.

2. "A spherical vessel, made of two hemispheres fitting closely together".

3. Tr., p.28; Es., Vol. I., pp. 233, 240.

The reason for the use of amyā and the sealing of its joints with luting clay is, comments Jildakī, the Sages' desire to imitate Nature. For the mineral substances originate in the depths of the earth, where there is no light and no air. The generation of a child inside a woman takes place under similar conditions; this is to ensure that nothing from outside interferes with its growth and causes its corruption.

Jābir in his K.al-'Aṭyān (The Book of Clays) gave, says Jildakī, the recipe for the luting clay. It consists of "one part of salt, calcined and coagulated after its dissolution, $\frac{1}{2}$ part of gypsum, and $\frac{1}{4}$ part of sifted ash or pounded charcoal!"⁽¹⁾ The ingredients are mixed and well pounded until they form a plaster, which is then refined and pounded for the second time with the white of egg, producing a very strong luting clay. The problem of sealing the joints is, according to Jildakī, an important subject in the Art.

An earthenware pot is taken; it is half filled with sifted ash, and then the vessel containing the 'compound' is placed⁽²⁾ in it. There must be an interval of 'two joined

1. Es., Vol. I., p.233 :

و هو جزء ملح مكلس معقود بعد حله و مثل نصفه من الجبر و مثل ربعه
من الرماد المنخول او الفحم المسحوق .

2. 'Suspended' is the actual term used :

علق

fingers'⁽¹⁾ between the fire and the pot. "The pot is then mounted on a symmetrical furnace, round or square, on the top of which there is a conical cupola, and at its side there are two small apertures to let out the smoke."⁽²⁾ The fire is supplied by a candle which has a wick made of $\frac{1}{4}$ dirham of cotton. This must constantly burn underneath the pot, and there should be no interruption during the whole period of operation; otherwise no result will be obtained. The continuous supply of heat makes "Nature to act upon this compound which is called magnesia and lead!"⁽³⁾ And after three days the lid is taken off to inspect the colour and the heat of the compound. This must be done very quickly, or otherwise the vessel may cool down and the generation stop. On taking off the lid, if we observed that the colour of the compound has turned black, we should know that the operation has so far been sound and we must then continue it for forty days. It is possible to reduce this period to less than forty days, by a trick which Jildakī does not find it appropriate to mention here. So at the end of this stage the

1. أصبعين مضمومتين : Most probably the width of two fingers and not the length.

2. Es., Vol. I., p.234.

3. وتعمل الطبيعة فعلها في هذا المقدار المسمى بالمغنيسيا والرصاص الا سرب.

moist part completely unites with the dry part. This is caused by the combination of 'the two moistures' ⁽¹⁾ on account of their similarity and their longing for one another. The moist part 'burns' completely all the particles of the dry part, and this is what the philosophers have called 'The Watery Burning'. ⁽²⁾ Jildakī quotes here a poem of Ṣāhib concerning the above operation.

"Take the sorrel egg and remove its shells,
It has, indeed, a choice part underneath the shells.
And take its water and mix it with the yolk, so that
you may see
Its dove in it, transforming to a crow". (3)

In this poem Ṣāhib has also referred to the first concealed operation, but no one will understand, says Jildakī, the meaning of his words unless he is adept in the Art. He then proceeds to explain the poem of Ṣāhib. When we refer to something as 'an egg', it implies, he argues, that

1. لا متزاج الرطوبتين : The moistures of the moist part and the hidden moisture of the dry part. (see p. 164 below).

2. احراق المائي

3. فان لها تحت القشور لبابا خذ البيضة الشفراء فانزع قشورها
حمامته فيه تصير غرابيا وخذ ماءها فاخالطه بالبحكى ترى

it has passed through many transformations prior to its reaching the stage of 'egg'. And when the philosophers' egg is laboriously and skilfully produced, it should then be possible to remove its shells and let it undergo another transformation. This would make feasible the mixing of its water with its yolk, and its heat with its cold. At the beginning the white colour is predominant, and that is why Sāhib compares it to a dove. It then takes the colour of dust and soon afterwards becomes blue, and after that it becomes gradually blacker and blacker until it looks like pitch, and that signifies the completion of marriage and combination and the appearance of dryness. The appearance of blackness is, as the Sheikh said, 'the sign of fertilization and dissolution'. This means that the substance, as a result of fertilization, becomes soft and slack and susceptible of dissolution 'in future'.⁽¹⁾ " And the amount of fire at this stage is $\frac{1}{7}$ of the moon's crescent, understand this. And you have to inspect it several times a day in order to remove the drops of dew from the bottom of the pot, so that they may not increase and accumulate and thus

1. في المستقبل

strengthen the heat more than it is required." ⁽¹⁾

Would it be possible to obtain any result in the Art "without this putrefaction?" In his attempt to answer this question, Jildakī says that 'this science', i.e., the Art, is divided into two branches. One of these branches is called 'The Operation', ⁽²⁾ and is the one with which we are here concerned. It deals with the preparation of the Elixir from the raw material by a process based on the imitation of Nature. And as this raw material is of two kinds differing in form, their unification confronts us with many difficulties to which 'Democritus has referred.' These two forms are of the same species, but one of them is earthy and dry, while the other one is tender and spiritual. There is in the dry part a moisture which does not appear on the surface : it is an internal moisture. And when the

1. Es., Vol. I., p.236 :

و مقدار النار في هذه الدرجة مبع الهلال فانهم ولا بد ان تفتقد في اليوم مرات
لتكشط عنه الحباب من أسفل القدر لئلا يجتمع و يكثر فتفوى الحرارة عن
المقدار الحاجة .

2. التدبير

moisture of the moist part penetrates, by the aid of a gentle heat, the depths of the dry part, then the two moistures, which are of the same kind, adhere to one another and thus bring about the unification of the dry part with the moist part. It is essential for the two parts to be made quiescent, ⁽¹⁾ that is, to prevent them from disturbing one another; ⁽²⁾ otherwise there will be corruption instead of generation. Needless to say, the two parts have to be thoroughly purified before they are brought together to be combined. The name given to this part of The Operation is 'putrefaction'. It has its counterpart in all the three kingdoms, and it is not possible to dispense with it. One good example is the putrefaction of sperm in the womb, another is that of a bird's egg at the time of brooding; and in both cases there should be a moderate amount of heat and moisture: an excessive amount of heat and moisture results in corruption, while an inadequate amount of them delays the progress of generation.

"As to the second branch (of the Art), it is called The Science of the Balance and Combinations, and it is divided into many parts". Jābir, Jildakī goes on, described them all

1. فوجب تسكينهما

2. انزعاج

in a great number of his books,⁽¹⁾ and Ṣāhib al-Šudūr referred to them in his Dīwān on several occasions. Muḥammad b.

ʿUmayl in his book al-Mabāqil (The Kitchen-garden) and Tuḡrāʿī in his Trākīb al-ʿAnwār⁽²⁾ dealt with some of them.

It may be said that all the Sages agreed on the necessity of removing the accidental qualities, but they disagreed as to how this should be done. Some of the Sages have said that the substances, after their impurities have been taken away, must be mixed until their dry part unites with their moist part. Then, while the heat is continuously and constantly supplied, an extra moisture must be added in order to disintegrate the dry part and dissolve what is appropriate in it, and leave out that which is not. This is called separation, 'dissociation of appropriate from inappropriate'.

There is no disagreement among the Sages with regard to 'the phases and the signs', but they differ in their estimates of the duration of putrefaction. Jildakī points out that in this as well as in his other books, he has tried, whenever

1. A collection of poems; a poetical book arranged in the alphabetical order of the final letters of the rhyming words.

2. The Combination of Fires, or blossoms, or lights, etc.

there has been a difference of opinion among the Sages, to find out which of these opinions is in accordance with the principles of philosophy.

Some other Sages have expressed the view that separation must precede mixing, and they have mentioned the relative weights of the substances used and the intensity of 'the two fires' employed. This, that is, the relative weights, says Jildakī, is a subject which is dealt with in the Science of the Balance (see p. 164 above). In that science special attention is paid to the purification of the metallic minerals and to the removal of their accidental qualities by various methods and combinations. Jildakī says that Jābir mentioned all these methods in his books, but in such a way that only the adept could understand them. As to Jildakī himself, he says he did not spend much time studying the Theory of the Balance and so he does not find himself in a position to enlarge upon the findings of Jābir. Jildakī makes this confession only to let us know 'that the sea of wisdom has no shores', i.e., it is boundless. But though he did not pay much attention to the Science of the Balance and Combinations, he found it possible to prove that these combinations were right. His reason is that, if one was able 'to combine pure mercury with silver, after their dissolution, by a special weight, this would indeed

generate an elixir stable in the refining fire", and this is a 'combination' suggested by the supporters of the Theory of the Balance. The same thing applies to gold; it is possible to generate from it, with the aid of pure mercury, an elixir capable of transforming silver into gold.

The blackness, continues Jildakī, to which the Sheikh refers appears after the combination of the ingredients; for before combination the latter are, on account of their having been purified, extremely white. Black like any other colour resides in the interior of the compound. In other words, colours, similar to natures, are only potentially present in the compound; but after the operation the predominant colour emerges from the interior of the substances and appears on the surface.

The internal properties of substances are different from their external properties. 'The matter' used in the above operation, i.e., putrefaction, consists of earth and water. Before purification the earth is hot and dry externally, and it is cold and moist internally. But after it has been purified it becomes cold and moist externally, and hot and dry internally, and thus the white colour comes on to the surface. The water also is cold and moist externally, and

dry and hot internally; it originated from 'the fluid earth', and since it is porous and contains heat in its interior and is capable of expansion, it is therefore able to dissolve other substances. When the water is distilled, it becomes radiant, white, and clear, so much so that it dazzles the eyes. This white, distilled water is cold, moist, and fluid, externally; it is red, hot, dry, and cutting like the edge of a sword, internally. And when the water is added to the earth, as a result of the reaction which takes place, all the internal properties appear on the surface, and all the external properties withdraw into the interior. Thus whiteness becomes hidden, and blackness becomes apparent. But why does the colour of the compound become black and not, say, red? The reason is that the black colour is in its nature cold and dry, that is, it has the qualities of the earth. And since it is the earth that dominates over the water in the above operation, that is, putrefaction, so the black colour prevails. There are other contributing factors which favour the appearance of blackness. One such factor is the fact that the water, as was mentioned before, originated, at the beginning, from the earth, and under certain conditions it exhibits the

properties of the latter. Besides, in the course of combination the likes unite and form a single substance, while the unlikes, which bear no resemblance to the other parts of the compound, are rejected. The rejected material is dirt, and it is therefore dry, cold, and combustible. This dirt has the nature of Saturn, and it appears on the surface of the compound like the froth which accumulates on the surface of boiling broth. So the appearance of the dirt on the surface of the compound is another reason for the predominance of the black colour. Still another reason for the appearance of the black colour is the fixation of vapour and smoke in the compound. This explains why the colour of the compound becomes at first blue, and as the concentration of vapour and smoke proceeds it moves towards blackness until it appears like tar.

The compound in question is formed at the end of the process of putrefaction, and its formation is due to coagulation and not to crystallization. Therefore, though it is soft, desiccated, and stable, yet it is not brittle and fragile. A compound which is prepared in the right manner must be capable of reproducing itself, that is, to unite with the likes and to reject the unlikes.

Jildakī then quotes three verses from a poem of Ṣāhib

which he had already quoted before (Es., Vol. I., p. 169).

"Hermes has a land which grows power and wealth,
When the strange, dry herbage has been removed from it.
And Gemini, the eyes of Mercury weep for it,
Pouring upon it like torrential rain.
And it becomes by the heat of sun after their union,
A dust, like the sifted, thirsty calx." (1)

The first couplet (the first two lines), says Jildakī,
refers to the process of purification, the second verse to
the concealed operation, and the third to the first uncon-
cealed operation . Jildakī quotes some other verses from
Sāhib, including the following quatrain:

"If we mix the lead with an equal,
Or less than equal weight of rain,
They transform into the body with which they began,
By what they have in their root of that nature." (2)

1. Es., Vol., I., p. 243:

إذا ما انتفى عنها غريب الحشائش

عليها بنجاج من الويل حافش

هباء كمنخول من الكلس عاطش

لهرمس ارض تثبت العزو الفنى

وابكت لها الجوزاء عبنى عطارد

وصارت بحر الشمس بعد اجتماعها

2. Es., Vol., I., p. 344:

من القطر وزنا أو أقل من القتل

بمآلهما من ذلك الطبع فى الاصل

إذا نحن ما زجنا الرصاص بمثله

وحالا الى الجسد الذى ابتدأ به

As was mentioned before, comments Jildakī, the earth has a cold and dry nature, and so has the lead, which is related to Saturn and is able to tincture the compound with its own colour. And this constitutes a reason to believe that lead is "the father of bodies, just as Saturn is the first of the seven planets."

The appearance of the black colour indicates that the dry part has completely united with the moist part. This union is so close that the two parts volatilise together when they volatilise and they descend together when they descend, in short, they do everything together. And that is why the Sheikh said: "... volatilising with it when it volatilises and entering with it into combination when it enters." We have now finished the first combination in the first operation.

Sheikh: "When this is so, we add to the black compound another portion of the moisture which we preserved, equal in amount to the first portion; we set it upon the fire and do with it as we did with the first, and we repeat this up to three or four times. And in the fourth time it dissolves and becomes a solution of which the parts are not distinguishable, and the moistness has united with the dry part as water unites with honey." (1)

1. Tr., p. 28; Es., Vol. I., pp. 244-5.

As was mentioned before, explains Jildakī, at the first stage of the first operation when equal amounts of moist and dry parts were combined, dryness became predominant. This accounted for the appearance of the black colour. And the reason for the predominance of the dryness was that both parts, dry and moist, were of earthy origin.

Now, the water, in contrast with the earth, is originally white. So if, after the appearance of the black colour and the completion of the first stage of operation, another portion of water, equal in amount to the first portion, is added to the compound, then the white colour will gradually supersede the black colour. The amount of heat at this stage should be a little more than the previous one. For the addition of moisture is accompanied by a reduction of heat, and in order to maintain the heat at its previous level, a little extra amount of it is required; otherwise the process of generation may slow down. But one has to be very careful, for the increase of heat beyond a certain limit will corrupt the compound, while a deficient heat does no harm except in reducing the speed of generation.

There are in general four kinds of fire employed in the production of the Elixir. They are: "the fire of

putrefaction, the fire of dissolution, the fire of volatilisation, and the fire of projection." The fire of putrefaction is the feeblest of them all, and it is divided into two kinds, one of them weaker than the other. So it may be said that there are on the whole five kinds of fire, similar to the five fingers of the hand. The fire used "in the first putrefaction" is the weakest, and that is why Buyūn al-Barhamī in his Risālah (Treatise) said that it "weighs one dirham of cotton and its thickness is that of the little finger."

Jildakī here agrees with Barhamī that the weight (of the wick) of the fire of putrefaction is one dirham, and this is contrary to his previous statement (see p. 160 above) that it weighs only $\frac{1}{4}$ dirham. He confirms, however, the other statement he made before (see p. 162 above) saying that the amount of fire in putrefaction is $\frac{1}{7}$ of the moon's crescent.

Jildakī then gives a detailed account of the successive stages of the addition of moisture. After the appearance of the black colour, at the end of the first combination, the compound is left to cool for one day and one night. It is then taken out of the vessel and an amount of moisture equal in weight to $\frac{1}{3}$ of the first portion is added to it. The mixture is well pounded and set upon a fire $\frac{1}{4}$ stronger

than the first. This means that the weight of the wick is increased to $1\frac{1}{4}$ dirhams. At the end of this stage (the second stage), which lasts as long as the first stage, that is, forty days, the colour of the compound becomes blue. The vessel is then put aside to cool for one day and one night, and after that the compound is taken out, mixed and pounded with another amount of moisture, equal in weight to $\frac{1}{3}$ of the first portion. The new mixture is set upon a fire $1\frac{1}{2}$ times stronger than the first. This is the third stage of the addition of moisture and it lasts like the previous stages for forty days, at the end of which the colour of the compound becomes light blue. The third stage represents the completion of the second combination. In a similar manner another amount of moisture is added accompanied by a proportional increase of fire. This is the fourth stage of the addition of moisture and it also lasts for forty days, at the end of which the moisture dominates the dry part and the white colour appears. The appearance of the white colour is, of course, gradual. This last stage represents the end of the revolution of Jupiter and the end of the mineral state. For the Sages tread in the steps of Nature, transforming the raw material of the Elixir from the mineral state to vegetable and then to

animal. They recognize four main stages in the production of the Elixir. The first stage is represented by the revolution of Saturn: the completion of the first combination and the appearance of blackness. The second stage is represented by the revolution of Jupiter: the completion of the second combination and the appearance of whiteness. The third stage is represented by the revolution of Mars, and the fourth by that of the Sun.

Now the reason why the total amount of moisture was divided into two portions and the second portion, unlike the first, was added in three stages, is that the Sages usually favour a long duration of operation.

Here Jildakī digresses from the main subject to tell us something about the relation of the Art to other sciences. He begins by saying that the Sages employ different methods to unite the moisture with the dry part. But they never make a mistake, and even if they do, they would understand what has gone wrong and put it right immediately. For they are able to see beyond the ordinary operations of the Art. They have the intelligence to understand the motions of the heavenly bodies. They first represent these motions by

(1)
 'imaginary' geometrical schemes, consisting of circles related to one another. Then by continuous observation of the variation in speed and size of the heavenly bodies as they appear alternately at their apogees and perigees, and by the calculation of their latitudes and longitudes, particularly when they are in conjunction or opposition, the Sages modify their schemes to bring them in line with the facts. By their knowledge of the heavens the Sages gain an insight into the mysteries of the lower world, that is, the world of elements or the world of generation and corruption. So there are two main sciences: one of them is "the science of Astronomy",⁽²⁾ which deals with the phenomena of the heavens,⁽³⁾ and the other is "the science of Precepts,"⁽³⁾ which treats of the phenomena of the lower world. And these two sciences yield two 'results'.⁽⁴⁾ One of the two results is the Art which gives wealth and satisfaction to all people

1. ^{متوهمة} : The use of the term 'imaginary' indicates that Jildakī favoured the geometrical scheme of Ptolemy, as distinguished from Aristotle's material spheres.

2. علم الهيئة

3. علم الاحكام

4. نتيجة

alike, and enables them to appreciate the immensity of the power of Allah. The second result is the acquisition of freedom to employ spiritual powers, and it is, therefore, the more important of the two. Anyone who becomes adept in the Art attains to "the Sage's step"⁽¹⁾, but one who acquires the freedom of employing spiritual powers reaches to "the Sage's goal."⁽²⁾

Returning to the main subject, Jildakī says that stupid people, if they make any mistake in the course of the operation, would not be able to correct themselves. But the Sages, though they employ different methods of manipulation, with regard to the intensity of fires, the weight of the materials, and the duration of the operation, yet in the end arrive all at the same result. For example, if a wise man observes that because of an increase in the amount of fire the colour of the compound at the end of the first combination has changed from black to red, he would immediately reverse the process to restore blackness, while a stupid person would not be able to do anything of the kind.

The statement of the Sheikh with regard to the addition of moisture to the dry part is obscure, says Jildakī.

1. رتبة الحكيم

2. غاية الحكيم

For it may give the false impression that the amounts of moisture added at the second, third, and fourth stages of the operation are each equal to the first portion added before the appearance of the black colour. Whereas the truth of the matter is that the total amount of moisture added after the appearance of the black colour must be equal to the first portion. That is, before the beginning of the operation the moist part is divided into two equal portions; the first portion must be added to the dry part in one body, but the second portion may be added in three or four stages. And at the end of this part of the operation, a homogeneous solution is formed by the union of the dry part with the moisture.

Sheikh: "Very often the light parts of the earth unite with the water while the coarse parts do not, but the coarse parts remain in the water as a sediment at the bottom of the supernatant liquid." (1)

Here the explanation of Jildakī contains only one minor point which has not already been mentioned. He says that the odour of putrefaction is so unpleasant that it affects the heart and spirit. One could avoid touching the compound at this stage with one's hands, if one were a good

1. Tr., p. 29; Es., Vol. I., p.254.

experimenter and had the necessary appliances. One could also anoint the nose with the oil of violet or nenuphar.

Sheikh: 'When this stage has been arrived at, half the first operation has been accomplished, and this is the first part thereof. It comprises the putrefaction [filtration] (1) and dissolution and liquefaction and fusion. "We now begin the method of the second part of the first operation.' (2)

Jildakī mentioned before that the completion of the first part of the first operation marks the end of the mineral state and the beginning of the vegetable state. He now says that the first part of the first operation does not comprise 'filtration'; for filtration takes place when the compound is in its vegetable state. This statement of Jildakī, like many of its kind, is, I think, significant for two reasons. In the first place, it gives support to the view that the printed text of Al-Muktasab translated by Holmyard is more accurate than the copy from which Jildakī gave his quotations. For putrefaction, which appears in the printed text in place of filtration, is certainly included in the first part of the first operation. Secondly, it

1. Pt., p.23: التمكنين ; Es., Vol. I., p.255 : التمكنى

2. Tr., p.29; Es., Vol. I., p. 255.

shows once again that Jildakī was not an incompetent compiler of commentaries, but had the knowledge required to detect discrepancies in the works which he undertook to explain.

Dissolution, liquefaction, and fusion represent, according to Jildakī, the three stages of the addition of the second portion of moisture to the dry part. As regards dissolution, Jildakī refers to an alleged statement of Socrates that: "Dissolution of things represents the perfection of philosophy."⁽¹⁾

Jildakī then proceeds to quote a number of verses from Ṣāhib, concerning the first part of the first operation. The following verse is an example:

"Clip his wings gently, and he,
When his feathers are clipped, becomes an eagle."⁽²⁾

By 'feathers' the Sheikh means, explains Jildakī, the dry part. The clipping of feathers implies the action of moisture upon the dry part. The transformation of the crow (see p. 161 above) into an eagle with clipped feathers implies that the compound has become stable and is no more capable of volatilization.

1. Es., Vol. I., p. 256 : تحليل الاشياء كمال الحكمة

2. Es., Vol. I., p. 256 :

و قص جناحيه برفق فانه اذا قص منه الريش صار عقابا

This is a continuation of two other verses translated before (see p. 161 above).

If anyone desires to understand all the poems of Sāhib, Jildakī refers him to his book Gāyat al-Surūr fī Šarḥ al-Šudūr, a commentary on the Dīwān al-Šudūr. He says that he wrote only four books on the Art: 1. K. al-Durrat al-Muḍīya fī Šarḥ Muḥammas al-Mā' al-Waraqī wa al-'Ard al-Najmiya which was completed after the present book; 2. K. al-Šams al-Munīr; 3. Gāyat al-Surūr; 4. Nihāyat al-Talab, the present book. Each of these books, says Jildakī, serves a particular purpose, and there is nothing in the Art which has not been mentioned in one of them.

Vol. I., Book II.

CHAPTER IV : Explanation of the fourth section of the second part, on the second part of the first operation.

Sheikh: "Know that when the compound dissolves, not all of the dry part dissolves, uniting with the moisture, but that which does not dissolve renders separation necessary after the dissolution, so we place upon it (the vessel with) (1) the cupping-glass, and we suck away by means thereof the moist parts which it contains. And when these have been separated they have performed upon the dry portions the action of heating, inasmuch as they have sucked away the moist portions that were in them (and made them to ascend with them when they ascend) (2), just

1. Appears in Pt., but not in Es.

2. Appears in Pt., but not in Es.

as fire sucks away the moisture of wood and makes it ascend as smoke." (1)

At the beginning of the first part of the first operation, explains Jildakī, the "amount of fire" is $\frac{1}{7}$ or $\frac{1}{6}$ of the Moon's crescent in the course of the operation. But this amount is gradually increased, until in the end the fire becomes twice as strong, i.e., $\frac{2}{7}$ or $\frac{1}{3}$ of the Moon's crescent. The gradual increase in the amount of fire causes the dissolution of every dissoluble component of the dry part. But the ultimate purpose is to disintegrate and dissolve the dry part completely. (2) So at the end of the first part of the first operation the vessel must be taken down from the furnace and left to cool for one day and one night. It is important not to open the vessel before it has cooled down, otherwise the "natural spirit" (3) of the compound will fly away. Subsequently a third portion of moisture, equal in amount to each of the first two portions, is taken and divided into six or seven parts, one of which is mixed

1. Tr., p. 29; Es., Vol. I., pp. 259-60.

2. Es., Vol. I., p. 260 :

والمقصود انما هو حل جميع اجزائه و انتفاض تركيبه بالكلية .

3. ریح الكبان

(1)
 in an alembic with the compound. The alembic is then set upon a very gentle fire, so that the top of it gets only slightly warm. This gentle fire ensures that at this stage only the water is evaporated and distilled, "and we have expounded nothing to this effect in any of our books except this one."⁽²⁾ At this stage that component of the moisture which is congruous to fire is strengthened by the fire element. Thus even the coarse particles of the dry part are dissolved in the moist part, and the latter performs upon the former "the action of fire upon wood." The distilled water now contains certain portions of the dry part and, because of this, it exhibits properties which it did not possess before : it is oily and gum-like.⁽³⁾

Here, Jildakī quotes several poems of Ṣāhib in which the above operation is described by analogy. He then proceeds to tell us more about the action of moisture upon the dry part at the present stage of the operation. "At this stage," he says, "the water takes from the earth an extract; and an extract from the water transforms into the earth. For the water attracts the oil of the earth, and the oil comes out with water, transforming into it; and the earth derives from

1. ذات الندى و الانبوب

2. Es., Vol. I., p. 261.

3. صنبا

the water a food, as a substitute for the oil that it has lost. And to this Jābir has referred in many of his books.⁽¹⁾ A symbolic representation of this statement of Jildakī would take the form of :



Jābir was the first one, says Jildakī, to recommend the use of myrtle stems in distillation. The passage from Jābir to which Jildakī refers here - he neither quotes the passage, nor mentions the name of the book in which it appears - must be the one in the LXX Books. This is translated and commented on by Kraus, who considered that the myrtle stems were used as a kind of filter with a view to slowing down the process of distillation.⁽²⁾

The term 'separation',⁽³⁾ which was previously used by Jildakī to denote the segregation of the appropriate parts

1. Es., Vol. I., p. 262-3 : أن في هذه الدرجة يأخذ الماء من الأرض خلاصة ويمتصبل إلى الأرض من الماء خلاصة أخرى لان الماء يجذب من الأرض الدهن فيخرج الدهن مع الماء مستحبلا إلى الأرض تجذب من الماء غذاء بدلا مما تحلل عنها من الدهن وإلى هذا المعنى أشار جابر قدس الله روحه في كثير من كتبه .
2. Kraus, Jābir b. Hayyān, Vol. II, Cairo, 1942, pp. 9, 12, 13.
3. تفصيل

of a substance from its inappropriate parts, is here employed to connote the isolation of the volatile parts of the compound from its involatile parts. Jildakī says that the myrtle stems must be used in both distillations - one of these distillations is carried out as part of the first, concealed operation, and the other, which was described above, is included in the second part of the first operation. If the myrtle stems are not used 'the water of the stone' would not reach the state of perfection and may not be called 'the divine water'. The Sages, particularly Jābir, have often given, according to Jildakī, different names to the same thing. The reader, therefore, must be very careful so that he may not be misled.

Jildakī then again emphasises on the necessity of the removal of impurities. He says that all the Sages have considered purification to be indispensable to a successful operation, but they have differed as to how it should be carried out. He invokes the authority of Socrates and ascribes to him a statement concerning the necessity of purification. He quotes here part of a long poem of Ṣāhib, which he had previously quoted at the end of Book I. In this poem, which Jildakī tries to explain, Ṣāhib compares the extraction of 'the oil' from 'the earth' to the production

of butter from milk. "The philosophers' water" may, according to Sāhib, solidify with heat and moisture, and the solid may in turn liquefy with cold and dryness. But the 'boric waters' are not stable in fire and do not solidify.

Sheikh: "Then add to it those very portions (of liquid) which have been removed from it, with the addition of another part, and pound well and submit to coction [to putrefaction] for a week as at first. Then distil it in an alembic, and continue to do that until the moisture which was reserved is exhausted, in six repetitions [-and we have seen in one copy (i.e. book) seven repetitions -], ⁽¹⁾ excluding the first distillation for the solvent moisture."⁽²⁾

In his explanation of the previous excerpt from the Sheikh concerning the first distillation, Jildakī said that a third portion of moisture is taken and is divided into six or seven parts. One part of this third portion of moisture was added to the dry part when the first distillation was performed. Now at each stage of the six subsequent distillations one part of the third portion of moisture is added to the compound. Each of these distillations takes seven days to complete and represents another stage of putrefaction. The intensity of fire in

1. The part between brackets does not appear in Pt.

2. Tr., p. 29; Es., Vol. I., p. 267.

the second distillation (or putrefaction) is increased by $\frac{1}{6}$ of a finger.' Jildakī does not say whether this amount is kept constant or is increased in the succeeding distillations. After each distillation, part of the spirit of 'the body' is extracted until in the end no spirit remains in it and it is reduced to a motionless dust.

All the joints of the apparatus must be firmly sealed, (1) "even those between the receiver and the proboscis." The retort, "as Jābir has taught us," must be kept in an oblique position during the distillation; further, it must have a large orifice, "because of the thickness of the water." Every care must be taken to prevent the entry of air into the apparatus, for failure in this respect causes an irreparable damage.

Jildakī then quotes a passage from the Risāla of B. al-Barhamī, who likens the six parts of the moisture to six women and the earth to a young man. These women chase the young man and bereave him of his reason by the force of love. "How deceitful are the women!" They decide to visit the young man together, and they call upon him three times. Each time they steal from him part of his secret, i.e., his spirit. In the end he parts with all his spirit and is

1. حتى فيما بين القابلة والخرطوم

reduced to a lifeless body. This description given by Barhamī implies, comments Jildakī, that there should be three more distillations after the completion of the sixth. The Sheikh considered that six distillations would be enough to extract the whole spirit of the earth. ⁽¹⁾ In order to make sure that no spirit is left in the earth, Jildakī suggests that the following test be carried out. A small amount of the earth is taken, and it is dropped upon a hot plate. If it emits smoke, then the process of distillation must continue, for there is still some spirit left in the earth. And if there is no smoke, distillation should stop. The oil which is dissolved in the water is not inflammable, for, if a drop of it is projected upon a slightly hot plate, it will tincture the latter - inside and outside - with the colour of pure gold. But this colour is not permanent and will soon fade away.

Sheikh: " Then you have reached the foodstuff free from the accidental portions unsuitable for the metallic species.

" Afterwards, purify seven more times this moisture in which the dry part has dissolved, by means of the finest sieves, and throw away any

1. It must be noted that the dry part or the earth, to which Jildakī refers here, is different from the original dry part; for it has changed its constitution during the course of the operation. The same holds true in respect of the moist part.

sedimentary residue each time, until the liquid becomes like milk." (1)

The secret of success in the Art, explains Jildakī, lies in the preparation of the foodstuff free from impurities. This foodstuff is uninflamable, and it originates from pure mercury and pure sulphur. Common mercury and common sulphur are not suitable for the purpose of producing the foodstuff, as they contain plenty of impurities. So the Sages derive the pure mercury and the pure sulphur from 'their stone', after removing its inappropriate accidental qualities. Mercury and sulphur are different in form, the former is soft and spiritual, and the latter is hard and earthy. The difficulty lies in combining these two in such a way as to form a simple homogeneous substance. This substance is liquid and is composed of two natures. It must be sifted seven times until all the impurities which were mostly added to it in the course of distillation are removed. And when this has been achieved it appears as a water which "resembles in purity the easily swallowable milk. It is the divine water from which whoever drank never died. And it is the first child and is called the vipers' saliva, the red blood, the water of life,

1. Tr., p. 29; Es., Vol. I., p.270.

and the birds' milk."

Jildakī then quotes three poems from Ṣāhib in which the properties of the foodstuff are described. Ṣāhib says that the material of the foodstuff is from the 'two sulphurs'. Jildakī observes that the 'two sulphurs' are the same as 'the two natures'. According to Ṣāhib the foodstuff resembles water in its appearance; but in its interior there is a hidden fire. This means, comments Jildakī, that the foodstuff ⁽¹⁾ has the nature of water but its effect is similar to that of fire. Ṣāhib compares the foodstuff to a dragon appearing in the clouds, and also to a dancing viper. The reason for comparing the foodstuff to dragon and viper is, explains Jildakī, that it is quick and moves very rapidly. And just as the dragon appears in the clouds so the foodstuff is formed out of the vapours of distillation. The dancing of the viper represents metaphorically the effervescing of the foodstuff before its evaporation. Jildakī explains in this manner a few other cryptic analogies of Ṣāhib and leaves the rest to be understood by the reader.

1. Nitric acid?

Sheikh: "Then the earth from which this moisture has been separated is taken and is placed in the aludel, the joints of which are sealed, while underneath it a violent refining fire is kindled. A stone will separate from the earth: white, pure and free from dross, resembling silver filings." (1)

The stone, i.e., the essence or the garland of victory, which separates from the earth; explains Jildakī, is free from all impurities. It has the nature of fire and possesses a sound constitution; it is dry, hot, and extremely white. It has also "the nature of alum, soda salt, sal ammoniac, natron, and the calx of the shell, on account of its being light. Furthermore, it has the nature of the calcinated salt and the like." (2) It is unflammable and does not emit smoke, for all the oils of the earth from which it is derived were dissolved in the water.

Now, whiteness always indicates coldness. Then, why is it that this extract is both white and hot? The answer is that it is cold externally, but it is hot internally.

1. Tr., p. 29; Es., Vol. I., p. 274.

2. Es., Vol. I., p. 275 :

و هذه الارض الخاصة ... بطبع الشب و ملح القلى والنوشادر والنظرون و
كلس القشر لختهاو كذلك فيها طبع الملح المكلس و اشباه ذلك.

It is a white, cold earth as regards its exterior, whereas it is a red, hot sulphur as far as its interior is concerned. If it were possible to derive this stone from the earth without resorting to volatilisation, no ashes would have been left in the vessel. But as it is, the separation of the soft part of the earth from its coarse part is only brought about by volatilisation. The soft part ascends to the top of the vessel and adheres to the cupola, while the coarse part remains at the bottom and is reduced to a red crumbly substance from which no benefit is derived. The soft part acquires stability only when it is reincarnated in a new body. The separation of the soft part of the earth from its coarse part is, according to Jildakī, that to which Jābir referred as "the major operation."⁽¹⁾

At the beginning of this operation the fire must be very gentle; and at the bottom of the aludel there should be some 'calcined salt' in order to prevent the fire from burning the valuable parts. Different kinds of fire produce different degrees of heat. The heat which is supplied by hot ash is the weakest, then comes the heat of a gentle fire, then that of saw-dust, then that of reeds, then

1. باب الاعظم : Kraus, Jābir b. Hayyān, Vol. II., Cairo, 1942, pp. 7, 11.

that of a single splint of Peganum harmala (a poisonous plant of Arabia), then that of two splints of the wood of the same plant, then that of three small splints, and finally that of three large splints. In the course of refining, the intensity of fire is gradually increased, and by the time when the strongest fire is used all the soft part of the earth has ascended to the top of the vessel.

The duration of this operation is seven days, although there is no need to know this. For, according to Jildakī, the resemblance of the stone to silver filings and other indications are sufficient to enable one to understand whether the operation is complete or not. The completion of distillation marks the end of the revolution of Jupiter. So the end of this operation, that is, the completion of separation, is represented by the revolution of Mars. And at this stage the vegetable state is over. We started, continues Jildakī, by operating on the earth, then operated on the water, and now we are dealing with the extraction of spirit, that is, the manipulation of the air, and when this is finished we shall operate on the fire.

Stupid people, taking the pronouncements of the Sages at their face value, try to extract, and purify by the refining fire, says Jildakī, the soft parts of the mineral

substances, such as sulphurs, mercuries, and arsenics.

They then try to fix these extracts in the smelting fire, and they believe that they would attain their object if they

mix them with 'the bodies' and 'cerate' them with 'sharp waters'.⁽¹⁾

This shows that only intelligent people are capable of understanding the Art, and the rest are always led astray.

Jildakī then describes the cleansing action of the salts. "And we say that there is no doubt that the salts possess the power of cleansing all substances and removing their dirts, and the Sages make soap from them. Reflect upon this and know its ingredients, so that you will understand the purpose. And the soap is, indeed, made of soda salt and gypsum."⁽²⁾ All kinds of clothes are cleansed with soap, no matter what sort of dirt they are contaminated with. But the dirt in clothes consists mainly of sweat which comes to the surface of the skin as a result of digestion. The bodily sweat contains some 'adhesive oil', because it is an animal product, and indeed all other kinds of dirt which pollute the clothes consist partly of some sort of adhesive oil. For it is the adhesive oil which causes

1. Es., Vol. I., p. 276 :

بمز جوها بالا جمادو بنعموها

2. Es., Vol. I., p. 277.

باللباء الحادة .

the dirt to attach itself to the clothes. If the soap is exclusively made of salts, it would have a deleterious effect on the hands and also on the material of the clothes because of its 'sharpness'. So the Sages combine 'the sharp water' with olive oil in order to prevent the former from injuring the hands or damaging the material of the clothes. The sharp water is combined with olive oil in a definite proportion and thus soap is produced. (1)

" So the salts possess the power of purification and ablution, while the sulphurs, arsenics and mercuries have the power of excellent tinctures and of combination. But the mercury is unstable in fire since it flies away from the latter, whereas the sulphurs and arsenics ignite by fire, because of what there is in them of inflammable oils." (2) It is not difficult to see in the inflammable oil of Jildakī the terra pinguis of Becher. There is in the inflammable oils, according to Jildakī, "a sound constituent" which is not volatile and may not, therefore, be separated by

1. It will be observed from this description of Jildakī's that 'the sharp water' which is used in the preparation of the soap is derived from salts. In this respect he uses the terms 'salts' and 'the sharp water' as synonyms.

2. Ibid., p. 278.

volatilization. The volatile part of the sulphurs and arsenics is an extract of their earthy constituent, and not an extract of their inflammable oils. But if it were possible to separate this valuable part of the inflammable oil, it would then be feasible to mix it "with the solvent bodies and the pure souls", whereupon it will impart to them the permanent colours which indicate the actual formation of the Elixirs. Jildakī is quick to point out that only the pure sulphurs and arsenics of the philosophers lead to success and no benefit is derived from common sulphurs and arsenics. "And by sulphur we mean the oil which does not burn, and similarly by arsenic (we mean) the white earth and by mercury the fluid soul. So understand this; and Ṣāhib al-Šuḍūr has referred to it in the rhyme of nun(N)."

Jildakī then quotes a long poem of Ṣāhib, in which the latter compares the 'garland of victory' to a star. "And know;" comments Jildakī, "that the Sages have given numerous names to the garland of victory. They have called it the fire, alum, generic sal ammoniac, soda salt, salt, lofty star, bright star, Mars, cutting sword, rennet, spiritual body, fiery body, combining stone, etc. So understand the hints of the Sages and their secret intentions!" (1)

(1) Ibid., p. 280.

Sheikh: "And when its sediment is taken from the earthy part which has been separated, it will indicate that the latter has to be accompanied by moisture. And as a consequence of this it is intensified and the operation may completely finish, if Allah, the Exalted, willeth." (1)

In this passage, explains Jildakī, the Sheikh refers in a cryptic way to 'the stage of juvenescence'.⁽²⁾ For, when the volatile part of the earth ascends to the top of the vessel and its sedimentary part is thrown away, if the water is then added to the former part, it will effervesce and evaporate. To prevent the escape of the water, moisture must be added to the sublimed part of the earth; and this is, according to Jildakī, what the Sheikh means when he says: "it will indicate that the latter has to be accompanied by moisture." And that which "is intensified," says Jildakī, is "the acritude of the water and its heat." Some of the Sages, he goes on, have dispensed with the stage of

(1) Es., Vol. I., p.280 : this passage does not appear in Pt.

فإذا كان ثقله يؤخذ من الأرضية التي انعزلت ول على ملازمتها للرطوبة ارمالا (٢)
واشتد عند ذلك فعمل كله يتم ان شاء الله تعالى.

(2) درجة الشيب

juvenescence, believing that 'the nature' will exert its special influence in the second operation in spite of the omission of this stage. But it is better to pass through this stage and then distil the water once more so that the process of separation becomes complete. Jildakī quotes in this connexion a poem of Sāhib, and then interprets some of the terms which the latter employs in a metaphorical sense. "The Sheikh who is drowning in the sea," says Jildakī, "is Pharoah and it is the garland of victory at the stage of juvenescence. And the fire which satisfies the thirst of anyone who drinks from it is the oil, and the combustible water is the spiritual vinegar and the first water!"

Sheikh: "When this comes to pass, we have obtained the prime food-stuff, namely, the earth and the water. Each of these two has two natures: thus the water has the property of dryness from the dry part (dissolved in it), and the property of moistness inherent in itself." (1)

The Sages, explains Jildakī, have regarded as prime matter anything which is capable of entering into combination and of moulding the form. The food-stuff of the Elixir resembles the chyme which is hidden in the roots of plants and also the chyme from which blood is formed in the liver

(1) Tr., p. 30; Es., Vol. I., p. 282. This passage is slightly distorted in Es., and the meaning is thus rendered obscure. I have therefore made no alteration in the translation given by Holmyard.

of animals. And, like the latter chymes, it is the product of five stages of digestion: 1. mixing, purification, and pounding; 2. first putrefaction, representing the mineral state; 3. second putrefaction and tamālīh,⁽¹⁾ representing the vegetable state; 4. refining of the spirit; and 5. purification of the earth and the water, representing the stage of juvenescence. At the completion of the five stages of digestion the food-stuff appears "like an easily swallowable milk" appropriate for the production of the Elixir.

The Sages, says Jildakī, spent plenty of time and gave a great deal of thought to find out whether there is among the materials in the world a substance which actually possesses the properties of the Elixir. They discovered that there is no such substance in the world, but there is one, the stone, which potentially possesses the properties of the Elixir. Now obviously it is not possible to use the stone in its natural state: it must be treated with fire so that its potential properties may become actual. And in order to protect the stone against the destructive action of fire, it is mixed with substances which are not combustible. For combustible substances when they are mixed with incombustibles

1. ناليج

become stable in fire.

(1)

Theriac, Jildakī goes on, is used as an antidote to counteract the influence of poison, or an attack of disease. Similarly the Elixir is employed to cure the diseases of the metallic minerals. But there is a difference between the two: the ingredients of the theriac may not be reduced to their elements before they are combined, while the component parts of the Elixir are purified and reduced to their elements prior to their combination. And after the combination of its component parts, the Elixir becomes a single homogeneous substance.

As regards the component parts of the Elixir, they are two : earth and water. The earth consists of two bodies, one is "the holy earth which is called the crown (or the garland); and the other is "the seedling which is called the laminated talc and the raw gold." The water consists of two natures, one is "the Eastern mercury which is the spirit," and the other is "the Western mercury which is the soul."

The water is dry "because it passed from the earthy form to the watery form, then to the airy form which is the oil, and at the end of operation to the fiery form. For it is in the nature of the oil to become the material of fire

and transform into it. And the nature of this water is the nature of the oil, for it is easily transformed into the fire."⁽¹⁾

The property of moistness is, as the Sheikh said, inherent in the water. That is because, says Jildakī,⁽²⁾ the water is 'an oily fluid.'

In short, the water has the nature of the air, for it is hot and moist, the property of hotness being hidden in it. The properties of hotness and moistness are also possessed by "the easily swallowable milk (derived) from milk"⁽³⁾ and by the 'mineral gold.'

Jildakī then quotes a passage from Muhammad b. 'Umayl, in which the latter subscribes to the opinion that the earth consists of two bodies and the water of two natures. The two component parts of the earth, according to him, are water and fire: $\frac{2}{3}$ water and $\frac{1}{3}$ fire. But fire and water, he says, are but metaphorical names given by the Sages to the two constituent parts of the earth, which are in fact bodies. As regards the water which consists of two natures, 'Ibn 'Umayl says that it is a 'bearer' for colours. It is white outside and red inside, 'for the spirit is hidden in it.' He mentions in ambiguous terms the weight of the water, and Jildakī undertakes to elucidate the matter in the second

1. Es., Vol. I., p. 283. Here again we find the terra pinguis of Becher.

2. مانع روهني

3. مانع الدرمن اللبن

volume of his present book. 'Ibn 'Umayl speaks of 'the leaven of the dough' added to 'their second body'. Jildakī considers 'the leaven of the dough' to be 'the generic sal ammoniac' which is added to 'the raw body', since the latter is 'unleavened':

Here Jildakī quotes a poem of Ṣāhib, describing the water and its action by means of similes. The water, says Ṣāhib, seems to have a mantle of silk brocade adorned with figures and embroidered with gold. It is the being which helped Satan to expel Adam and Eve from the 'Middle Sphere'. It kills the living and reanimates the dead, blackens the white and whitens the black. Jildakī says that the water to which Ṣāhib refers is 'the first water and the spiritual vinegar', and it is also 'the divine water with perfect nature'. For these two waters act in the same way, and, moreover, without 'the first water' it would not be possible to accomplish 'separation' and consequently no 'divine water' will be produced. But there is, of course, a difference between the two waters. 'The first water' is 'sharper' than the 'divine water', but the latter is more oily than the former. The first water is used for the ablution and softening of the 'hard rocks', while the divine water, because of its strong oiliness, is employed to smelt the rocks and combine with them, giving their particles stability and

firmness.

The Middle Sphere, according to Jildakī, "is the orbit of the sun in the fourth firmament where the paradise is." And Satan is the element of fire and also 'the hidden natural fire', for it is in the nature of Satan to act stealthily. Ṣāhib compares the water to the being that helped Satan in causing the descent of Adam and Eve to the earth. In the same manner, Jildakī goes on, "the first water and the property of fieriness cause the descent of the male and the female, the dissolution of their parts, the calcination of that portion of them which has to be calcified, and, in short, the purification of the matter." It is the first water which kills the earth for the first time and blackens it, and it is the divine water or the second water which kills the earth for the second time after it has been revived, whitening it at the same time. "The Sages", says Jildakī, "have called the first water the triangle, the strong vinegar, the salt, and the key."

Jildakī then quotes three poems from Ḥālid, a passage from K. Hayāt al-Hayawān of Jābir, and also a passage from Hermes, concerning 'the first water' or the vinegar. The passage quoted from Jābir is to the following effect:

Vinegar, says Jābir, is used in the preparation of different things. And there are various kinds of vinegars:

the strong vinegar; the weak; the one which dissolves some substances but not all; the one which dissolves all substances but does not refine them; and finally the one which dissolves all substances and refines them at the same time. The latter is the best vinegar and it is employed in the preparation of the Elixir. This vinegar yields the best result when it is very sharp, and is free from oiliness and impurities. And if there are streaks of dirt and blackness in it, they should be removed with the help of 'another soul', until it becomes tinctorial, and stable in fire. Vinegar occupies a very important place among the substances used in the Art, and acquisition of the best kind of it resolves most of the difficulties of the practitioner. (1)

Hālid in his three poems quoted by Jildakī describes the 'strong vinegar' of the Sages as "the solvent and the washer of turbidity." He considers vinegar as a very important substance used in the Art. He says that the Sages have always been niggardly in their references to vinegar, and have spoken of it in enigmatical terms.

The pseudo-Hermes describes in the passage quoted by Jildakī the preparation of vinegar. 'Mercury', says Hermes, "is distilled with a gentle fire until it becomes yellow;

1. Es., Vol. I., p. 286.

and the sediment is calcined until it turns white. And then for each part of this calx nine parts of the water is taken, and they are placed in a glass vessel which is buried in manure for a week. The water thus acquires the pungent taste and the acritude of the calx and becomes a volatile vinegar.⁽¹⁾ Hermes then describes the properties of this vinegar. It blackens, whitens, and reddens; at the beginning of operation it is used for dissolution, and in the end for combination or coagulation - "it is the key of operation."

Sheikh: "The earth also has two natures; one of them is the volatile earth, which has refined away from earthiness - it is hot and dry. The other is the residual earth, cold and dry, and in this there is no advantage nor miscibility; it is black and dry, and we took it only to split up this prime matter and divide it, so that its earthiness might be got rid of. Concerning this the philosophers said 'The Arabs will not submit to transport rocks nor to carry mountains And they meant thereby only this earth which is cold and dry, profitless, immiscible, dark and dull.
'We have now obtained the food-stuff free from all obstructive accidental qualities.'" (2)

"When", explains Jildakī, "the revolution of Mars came to an end and the garland of victory became visible and the soft part separated from the coarse part, we threw away the

1. Ibid., p. 287.

2. Tr., p.30; Es., Vol. I., p. 288.

coarse part, for it was, as the Sheikh said, a dark, dull,
and profitless earth."⁽¹⁾ The world of the Art, Jildakī

goes on, must be free from all impurities, and that is why the coarse part is thrown away after separation. As regards purity, grandeur, and nobility, the Art resembles the Arab race. Arabs do not submit to be employed as slaves like the Sudanese, or as beasts of burden like 'foreigners'. Jildakī greatly enlarges upon this subject, i.e., the superiority of the Arab race, and quotes a poem from Ṣāhib to the same effect. But he later remarks that what the philosophers meant by Arabs, when they said "The Arabs will not submit to transport rocks nor to carry mountains", was the students of philosophy, Arabs as well as foreigners.

With regard to the necessity of purifying the substances employed in the Art, Jildakī gives three quotations from K. al-'Ihrāq (The Book of Combustion), part of the 500 Books of Jābir. "There are", says the latter, " (two) kinds of

1. A line is drawn on top of eight words in p. 288 of Es., including the Arabic equivalents of the five words underlined above. On the right margin of the same page appear five sums and on the left one sum. These sums definitely represent the power of the words on top of which a line has been drawn, according to the arithmetical arrangement of the alphabet. But it is difficult to establish which of these arrangements has been employed, for there have been several of them, each favoured by a number of writers.

(1)
 combustion, one of them causes pain and the other, refinement.
 For it (i.e. combustion) is either sensuous or psychical,
 the former concerns the body and the latter pertains to the
 spirit."⁽²⁾

In the next two quotations Jābir considers
 the spirit to be immortal and therefore immune from evil
 influences. Accidental qualities, he says, afflict the body
 and not the spirit, the latter remains at all times
 unaffected. Now one of two things may happen in combustion:
 either the body burns away completely and the spirit is set
 entirely free, or only the accidental qualities are removed
 by the fire and the body is left in a healthy state. So in
 either case combustion may be considered beneficial on account
 of its purifying effect. Jildakī praises Jābir, as he often
 does, for the vastness of his knowledge and the correctness
 of his views. Enlarging upon the pronouncement of Jābir
 with regard to combustion, Jildakī says: "Combustion is the
 cause of the purity of the body, and the purity of the body
 is the cause of its association with the spirit, and the
 association with the spirit is the cause of the love of the
 body (for the spirit), and the love of the body is the cause
 of its union with the spirit, and this union makes the body

1. احراق

2. Es., Vol. I., p. 290.

spiritual like the spirit, and when the body becomes
 spiritual it acquires eternal life and freedom from death.'⁽¹⁾

Comparing the pure substances with those which are impure, the Arabs with 'foreigners', and the intelligent students of philosophy with the stupid commoners, Jildakī refers to a verse from Šāhib which he had previously quoted in another connexion (see p. 69 above) :

"What a difference between the two, this a planet
 Which revolves, and that a centre for the centres."

The 'centre for the centres' is the earth which is trodden under foot, and which represents the impure substances, the 'foreigners', and the stupid people. The 'planet which revolves' represents pure substances, the Arabs, the philosophers, the sal ammoniac, and the garland of victory. The distinction which Jildakī draws between 'the earth' and 'the planet' is in harmony with the Aristotelian cosmology.

Referring to the statement of the Sheikh that "The earth also has two natures," Jildakī says that "this earth has five properties," and he proceeds to describe them: 1. It has a soft, fiery and boracic sharpness, and on mixing with the divine water, the latter acquires this property and becomes

1. Ibid., p. 291.

more penetrating. In a similar manner the sharpness of the first water and its quality of calcification and disintegration is increased by the addition of 'the calx of the first stone'; 2. It has the power of coagulation, and it coagulates and combines different parts of the Elixir, just as rennet coagulates milk; 3. It has the power of preventing the pigment dissolved in the water from escaping; 4. It is penetrating; subtle, and acts as a leaven for the Elixir; and 5. It has the power of uniting the body with the spirit in the second operation, just as "the philosophers' salt" unites the male and the female in the first operation. So both the earth and the philosophers' salt act as 'mediators'; they are called 'the two sal ammoniacs', the latter being the mineral one.

With regard to the two sal ammoniacs, Jildakī gives two quotations from Hermes, in which the latter describes their properties. Sal ammoniac, says pseudo-Hermes, brings order and stability to the world, it strengthens the bodies and paves the way of success for the philosophers. It is the philosophers' soap, it makes the bodies white and coagulates the souls and gives protection against the destructive action of fire. In the next passage ascribed to Hermes, sal ammoniac is considered to be fiery because of

its acritude, watery because of its easy solubility, airy because of its lightness and volatility, and earthy because of its aptitude for combination and coagulation. "If it possessed also", says Hermes, "the oily, sulphuric nature from which all the colours evolve, it would be perfect."

After obtaining the pure food-stuff, the philosophers, says Jildakī, "feed their embryo and plant their seedling in their earth", as was mentioned before.

(1)

Sheikh: "It has three powers: the power of tincturing, the power of coagulating, and the power of dissolving [penetration]; but it lacks the power of retention and fixation. Now this is the nature of the earth, so we must substitute for the latter this stable and fire-resisting metallic species, which will be to these natures (namely the water, the air and the fire) in place of the earth. Nay rather, it is the earth in relation to the other three, since it is naturally stable in the most violent fire. It also resembles the growing plant-seedling, while these three natures will be like food [power] (2) for it!" (3)

"The power of tincturing," explains Jildakī, "is the spirit carried by the water; the power of coagulating is the fire present in the nature of the crown; and the power of

(4)

1. The food-stuff.

2. Pt., p. 24 : كالفذاء ; Es., Vol. I., p.299 : كالفوى

3. Tr., p.30 ; Es., Vol. I., pp. 293, 299.

4. Or garland.

penetration is contained in the sedate and penetrating soul." The isolated food-stuff, Jildakī goes on, possesses the three powers already mentioned; but these powers or spirits are transient, for they are not contained in a body. And the only possible way to prevent the evanescence of a spirit is to enclose it in a body. Bodies, on the other hand, do not reveal their characteristics and properties except through their spirits.

Of the three powers possessed by the food-stuff, one is fiery, the other airy, and the last watery. But these three principles, ⁽¹⁾ namely fire, air and water are not stable and steady when they are left alone. Earth, on the other hand, is the principle of stability. Therefore, to make the food-stuff wholesome and perfect an appropriate kind of earth must be added to it, in such a way that a state of equilibrium is reached among the four principles. Thus the properties or the powers of the food-stuff become stable and fixed, resisting the destructive action of fire.

Jildakī says that the food-stuff thus prepared is 'the stone' to which Buyūn al-Barhamī has referred in his Risāla. He quotes the relevant passage in which the above-mentioned properties of the food-stuff are ascribed to 'the

1. ارکان

stone'. The passage ends with these words: "It is the real and actual son of the fire, and it is the copper which has been described and greatly honoured by the philosophers."

Jildakī quotes Heraclius as saying that there are two kinds of water, one of them stable and the other volatile; and just as the volatile water is made stable by being mixed with the stable one, so the evanescent souls are made immobile by being enclosed in bodies.

Jildakī then gives a quotation from Jābir's Šarḥ K.al-Rahma (Commentary of the Book of Mercy). "Their assertion", says Jābir, "that 'The living dominates the dead,' means that the souls, as has been said, are the bearers of the tinctures. And the bodies are considered by the Sages as the earth on which the tinctures are planted. Bodies are dead things, for their own colours are of no value, but the souls which they embody dominate them, influence them, and give them tinctorial power in so far as they themselves possess it. There is no power in the bodies with which to influence the souls. Bodies are carriers of accidental properties, such as the tinctures of the souls. Therefore, when the bodies combine with the souls they acquire the tinctures of the latter and give them stability. And for this reason it is said that 'The dead imprisons the living'. So bodies are inanimate, and if they were not tinctured with

the colours of the souls, they would produce no effect,
but after they are tintured they become possessed of life".⁽¹⁾

Here Jildakī quotes a poem from Ṣāhib, in which the latter refers to Jābir in rather unfavourable terms. The following are the lines in question:

'Do not beseech the dead minerals for a tincture,
Even the permanent kind of it is a prey to fire and
is perished thereby.
Pay no attention to the words of Jābir,
His methods destroy what you have already got firm
in your hands.'"⁽²⁾

Jildakī says that Ṣāhib did not intend to refute Jābir, but he wanted only to remind the student of the Art of the possibility of being misled by the Jābirian writings. For Jābir himself has made it clear in all his books that a purely literal interpretation of his words would be misleading. In the first place, Jildakī goes on, Jābir, according to his own words, was in the habit of dispersing his accounts of a single subject over a great number of books. Secondly, his method of explanation was not straightforward, and only the adepts would be able to understand his real intentions.

Referring again to the statement of the Sheikh that the

1. Es., Vol. I., p.295.

2. Es., Vol. I., p.296.

food-stuff "lacks the power of retention and fixation" and "so we must substitute" for it the metallic species, which is stable and fire-resisting, Jildakī says that it contains a difficult point which needs to be explained. The apparent meaning of the statement in question is that the refined substance is volatile and has to be made stable by the addition of the species referred to. But the use of the term 'substitute' indicates that the power of retention was already present in the food-stuff, yet because of its being corrupt and ineffective it had to be substituted by the metallic species.

Further, Jildakī thinks that in the above statement of the Sheikh there is an implicit reference to "the major animal operation in which the operator needs neither sal ammoniac nor the new body."⁽¹⁾ This operation, continues Jildakī, has been explained by Jābir in his K. al-Damīr (The Book of Secret Thought) and other books included in the 500 Books. After the extraction of the water and the oil from the stone, says Jildakī, giving an account of the views of Jābir with regard to the above-mentioned operation, the black sediment which remains contains neither spirit nor tincture. This sediment is treated, in the major operation,

1. Ibid., p. 297 :

الباب الاعظم الحيواني الذي لا يحتاج مدبره الى نوشار ولا الى الجمد الجديد .

with the white water until all its impurities burn away and only a pure, white, stable, unflammable, silvery qār-like⁽¹⁾ portion of it remains. "A single part of this portion tinctures from 50,000 to 250,000 parts, and one part of the least powerful kind of it tinctures 12,000 parts. And for this reason it is described as animalic, which represents the rank of those who have reached to the end of philosophy and do not require a new body. On the contrary, they return the souls to the body from which they have been extracted, after they have adorned it with stability."⁽²⁾ But this operation takes a long time, and it is very difficult to whiten the earth and remove its impurities just after the extraction of its souls. So the Sages prefer to heat the sediment and derive from it an extract called sal ammoniac, which they enclose in a new body, substituting the old one.

With regard to the statement of the Sheikh that the 'metallic species' acts 'in place of the earth' (lit : like the earth), Jildakī says that it admits of two interpretations. In the first place, it may imply that the 'metallic species' and 'the earth' are one and the same thing. Secondly, the statement in question may only mean that the metallic species

1. See p. // above : ن

2. Es., Vol., I., p.298.

is like earth, "just as the stone's water is like water and its air like air and its fire like fire, and there is no doubt as to its being stable, in the most violent fire!"

The explanation of Jildakī as to the respect in which the metallic species "also resembles the growing plant-seedling", is by no means illuminating. He attaches special significance to the term 'also'. It seems to be clear that as the Sheikh had compared 'the metallic species' to 'the earth', so he preceded his proposition concerning its similarity to 'the growing plant-seedling' with the term 'also'. Jildakī agrees with this explanation only half-heartedly. He says that the use of the term 'also' may imply that there was another simile intentionally left out by the Sheikh. And he takes that whereunto 'the metallic species' is primarily likened to be 'the divine water', for the latter is as necessary for cultivation of gold as 'the growing plant-seedling' is.

The 'three natures' which according to the Sheikh "will be like power" for the metallic species are the fire, the air and the water, representing respectively the three powers of coagulation, penetration and tincturing.

Sheikh: "For the white earth will be in place of the ground, and the water which has combined with the dryness will be like the food material; from their conjunction the plant form will

be derived and the moist will unite with the dry, and all the food will be changed into that species which is grown in it, since the unsuitable accidental quality is no longer present. And the whole will be converted, by gentle fire and (i) little moisture, into the Elixir of Whiteness."

Jildakī's explanation of the above passage is short and consists mainly of reiteration of the Sheikh's words. Referring to the Sheikh's statement that "the moist will unite with the dry", Jildakī says that this union will result in the apparition of colours. He considers the 'gentle fire' to which the Sheikh refers to be the 'fire of putrefaction' which coagulates the spirit and the soul. If a violent fire is used before the completion of coagulation, the moisture will evaporate and ascend to the top of the vessel, and consequently the operation will end in corruption.

Sheikh: "It is necessary that you should know that the prime matter for this metallic species is miscible in the natural untreated state; and you must dissolve it and unloosen its combination with a generative unloosening, and not a corrupting one, so that it may not be prevented from mixing and may not lose its specific nature.

"Have you not considered mercury - how it mixes with the two leads and other bodies in their natural state? But if you calcine one of these bodies or dissolve it with a corrupt dissolving, the mercury is prevented from mixing. It is therefore necessary that the

decomposition and solution should be generative and not corrupting." (1)

The prime matter of the metallic species, because of its hardness, explains Jildakī, may not be used as a food before the unloosening of its combination. And the unloosening of the combination must be generative and not corrupting, so that while the impurities of the species are removed, its form and specific nature remain constant. Moreover, a generative unloosening makes the prime matter capable of entering readily into combination, whereas a corrupting unloosening may destroy the adhesive moisture contained in the species and prevent the latter from mixing with other substances, such as the mercury.

That is all Jildakī has to say concerning the above quotation from the Sheikh.

Sheikh: "An example of corrupt decomposition is copper which has been converted into verdigris and then dissolved to a green solution - that is a corrupt decomposition. An example of a good decomposition and solution is found in the moisture which enters upon the dryness in the stomach and is raised to the liver free from all impurities; it mixes with the animal, and that food becomes part of it, nay, rather it becomes another animal, and afterwards is raised to the breast of the woman as easily

1. Tr., pp. 30-1 ; Es., Vol. I., p.300.

swallowed milk, where the child is fed with it, and it mixes with him and makes him grow and get larger and increases his limbs.

"And if it be not thus, then it is a bad decomposition and not a proper one. But if it be thus, we have completed the qualitative part of the second section of the first operation, and now have the substance in which is grown that vegetable plant, nay, rather, mineral plant, if Allah (may He be exalted!) will. So understand." (1)

Jildakī begins his explanation here by praising the Sheikh for his orderly treatment of the successive stages of operation. He believes that no one else besides the Sheikh has dealt with the subject in such a systematic manner. He believes also that the Sheikh has revealed in his book a substantial part of the operations which other authors kept secret. And he expresses the hope that his own book would complete and supplement that of the Sheikh, leaving nothing untold.

The conversion of copper into verdigris constitutes an example of corrupt decomposition, because, according to Jildakī, the process is not reversible. ⁽²⁾ As regards the combination of the moisture with the dryness in the stomach, to which the Sheikh refers as an example of good decomposition, Jildakī makes allusions to the account he gave before of

1. Tr., p. 31 ; Es., Vol.I., p. 301.

2. *بمنع عودة*

digestion and reproduction.

He then quotes the K. Šarh al-Rahma of Jābir in connexion with the importance of decomposition. ⁽¹⁾ The latter says that decomposition is indispensable, and the souls would not enter the bodies nor would the bodies receive the souls prior to decomposition.

Jildakī says that there are three kinds of decomposition ⁽²⁾ (or dissolution): 1. Decomposition by evaporation in aludels, bowls, and the likes. This itself is of two kinds : a) by calcination and combustion; b) by corrosion and putrefaction. 2. Decomposition by dissolution in the water until all the principal parts of the substance or some of them are converted into a limpid water. This dissolution may or may not be accompanied by corrosion. 3. Ceration, that is, the liquefaction of the substance by heating and perspiration, ⁽³⁾ and by mixing the parts and melting them in bowls over a gentle fire.

Jildakī here quotes a poem from Šāhib concerning ceration. But, as Jildakī himself remarks, there is nothing in this

1. Jildakī : والى هذا النقص اشار جابر ; Jābir : لا يكون عمل الا بتحليل
It appears that Jildakī thought that نقص is the same as تحليل, at least in this particular instance.

2. انسام

3. التعريق والاسخان

poem which relates to ceration, apart from the allusion in the opening line.

'Understand the ceration, for behold!
Its understanding is the desire of every disciple!'

In fact, Ṣāhib himself concedes that he could not describe the process of ceration, for it comprises everything in the Art.

"Our Art is hidden in it, just as
Our corporeal forms are hidden in the sperms!"

Jildakī ignores the cautious attitude of Ṣāhib and proceeds to describe the different kinds of ceration. There are, he says, five kinds (or ways) ⁽¹⁾ of ceration, namely, pounding, softening (or moistening), decomposition (or dissolution), ⁽²⁾ coction (or maturing), and coagulation (or combination).

These five operations, Jildakī goes on, include every process ⁽³⁾ in the Art with the exception of evaporation, 'for the

1. **انواع** : The account which follows shows that what Jildakī meant was the different stages of ceration.

2. **السحق - التلطيف - التحليل - الطبخ - المقد**

3. **التصعيد**

latter is not a requisite part of the ceration!" And
 the reason why there is no need of evaporation is that
 purification⁽¹⁾ of the substance is not necessary in ceration.
 Nevertheless, distillation⁽²⁾ is included in ceration, because
 'some drops of the water' must be added to the compound in
 order to remove its rust and prevent it from being burned
 by the fire.

Vol. I., Book III.

CHAPTER I : Explanation of the first section of the
 third part, on the manner of the first part of the second
 operation (this concerns the Elixir of Whiteness):

Sheikh: "Know, may Allah have mercy on thee, that the
 method of the Chemical Work is divided (into
 two operations, and each of these is divided)⁽³⁾
 into two other operations. We have already
 described the two parts of the first operation,
 and will now describe the two parts of the
 second operation, beginning with the first of
 them; this is the preparation of the Elixir of
 Silver. We shall first explain the quantitative
 part and then the qualitative. Know, may Allah
 have mercy on thee, that the Elixir of Whiteness
 is composed of parts various in weight, and of
 four equivalent natures: of the two earths, one
 part; of the water, $1\frac{1}{2}$ parts, and of the air
 $1\frac{1}{2}$ parts. As for the two earths one of them
 is a salt and the other a vegetable plant. The

1. التطهير

2. التقطير

3. The part between the parentheses does not appear in Es.

whole is well mixed and placed in a vessel appropriate thereto upon a hatching fire, and heated for the time which Allah wills, after which there appears in it a colour differing from its own colour, and it becomes a black amber." (1)

The statement of the Sheikh, explains Jildakī, poses five questions, namely, the weights of the parts of the compound, the suitable apparatus for the operation, the manner of combination, the intensity of fire, and the duration of the operation. As regards the weights, Jildakī proposes to examine the matter in the second volume of his present book. With regard to the duration of the operation, he says it is seven days, the reason being that the Arabic equivalent of the clause "heated for the time which Allah wills" consists of seven words. The manner of combination is similar, according to him, to the first combination and the mixing of the earth with the water. The rest of the questions referred to, says Jildakī, have been dealt with in the course of the present book. He adds that the black colour which appears in the second operation is more agreeable than that of the first.

1, Tr., pp. 31-2; Es., Vol. I., pp. 304-5.

Sheikh: "Or often the ashes at this stage become black with a permanent yellow in it!" (1)

The first part of the second operation, explains Jildakī, represents the beginning of the fructifying and harvesting period. And just as bread may be eaten unleavened and certain fruits may be consumed unripe, so the product of the Art at this immature state may be made use of with a measure of success. If, for example, it is projected upon silver, it will tincture the latter imperfectly with the colour of gold. Here, Jildakī quotes a verse from Hālid:

"Your first blackness if you understand,
Contains riches for the one in poverty."

'Your first blackness', comments Jildakī, does not refer to the blackness in the first operation, but to the first blackness in the second operation, as in the latter operation there is another blackness which follows the first. This second blackness is actually red and purple, for blackness is concentrated redness. The aim of the first operation is decomposition, while that of the second operation is

1. Tr., p. 32 ; Es., Vol. I., p. 305.

generation. It is, therefore, evident that the blackness which denotes richness and prosperity comes from generation and not decomposition. And the yellow colour which evolves from the blackness associated with generation will never fade away.

Now Saturn represents the black colour, and contrasting the blackness of the first operation with that of the second, Jildakī explains when this planet is auspicious and when it is ill-omened. Saturn, he says, moves slowly, and the period in which it is considered to be lucky is associated with its direct motion and with its occupying a definite position in respect to the two fires (i.e. sun and moon). In this connexion Jildakī quotes one quatrain, a couplet, and an ode from Ṣāhib; an ode from K.al-Firdaws (The Book of Paradise) of Ḥālīd; and a passage from K.al-Sab^ca (The Book of Seven Metals) of Jābir. As the passage from Jābir includes all the main points described in the above-mentioned poems of Ṣāhib and Ḥālīd, it is desirable to give a complete translation of it here.

" Know, that Saturn is most ill-omened and the sun is most auspicious, and the light of all planets, including Saturn, is derived from the sun. And has Saturn ever been in quadrature with the sun and (at the same time) in opposition with the moon? It has not even been near to this

aspect, and it will never happen to be; but it has been in direct opposition. However, if the sun were facing it on the right and the moon were turning away from it on the left, Saturn would change, in the twinkling of an eye, from being ill-omened to being lucky. For, for an hour⁽¹⁾ the sun faces it and clothes it in light and splendour. And since the face of the sun is turned towards Saturn, we say that the sun faces it on the right and the moon on the opposite side."⁽²⁾

Referring to the significance of Saturn's change of presage, Jildakī says that some of the words of the Sages admit of different interpretations, and that he has tried in his present book to give only those explanations which would take the reader nearer to the heart of the matter. So he proceeds to describe the full import of the change of omen which befalls Saturn. In this connexion, he refers to the possibility of removing the accidental qualities of the imperfect metals, repeating mainly his previous arguments in different words.

He reminds us of the Sheikh's statement that the defective metals attain to the state of perfection either by

1. *al.* : meaning also : for a short while.

2. .Es., Vol. I., p. 308.

the action of fire or by the help of the Elixir. The reason why the Sheikh discounted the action of fire was that a gentle one would require a very long time before it became effective, while a violent fire would be too destructive. With regard to the action of fire, Jildakī has something new to say. 'The nature'⁽¹⁾, he says, would produce no effect on imperfect metals after they have been taken out of their mines. For while they are in their mines the action of 'the nature' on them is supported by 'the sulphur and the mercury combined;' until in the end, when they become gold, 'the nature' ceases to have any effect on them. But if before they reach the state of perfection they are attacked by accidental qualities or are unearthed by excavators, they stop developing any more. Silver, for example, if it comes from a gold mine, may yield a small amount of gold on 'decomposition';⁽²⁾ but if it comes from an ordinary silver mine or any other mine except gold, no gold may be extracted from it.

There are, Jildakī continues, only two ways of transforming silver into gold, after it has been dug out of its mine. "The first one is to cerate it with the water of

1. Meaning heat and moisture.

2. تحليل

(1)
 the two gums, and the second is through the second combina-
 tion by mixing (it with) certain red bodies (2) in the smelting
 fire, as it would (willingly) receive the Elixir of Redness
 in the smelting fire." (3) It is impossible, in spite of
 the statement of the Sheikh to the contrary, to transform
 silver into gold by the action of fire alone while 'the
 nature' has ceased to exert any influence. The Sheikh, we
 remember, discounted the gentle fire only because it took
 many years before it produced any result, whereas Jildakī
 believes that the gentle fire is of no use at all, whatever
 the duration of operation. As regards the violent fire
 Jildakī agrees with the Sheikh that, although it destroys the
 greater part of the silver, it tinctures a tiny fraction of
 it with the colour of gold. But perhaps, says Jildakī,
 the Sheikh's reference to the effect of the gentle fire was
 no more than a metaphor. According to the Sheikh silver is
 transformed into gold either by the action of fire or by the
 use of 'the drug'. But the most celebrated Sages, Jildakī
 goes on, have expressed the opinion that the transformation
 takes place either by operation, which is the same as the use
 of 'the drug', or by balancing the constitution of the silver,

1. ماء الصفتين

2. الاجساد الحمر

3. Es., Vol. I., p. 311.

that is, by mixing it with certain pure, red, fusible bodies in the smelting fire. The Sheikh denied that the latter method, which includes the mixing of different metals, would produce any result. He considered elementary minerals incapable of effecting any transformation: " So that which we seek is not to be found among the elementary minerals."⁽¹⁾ Jildakī agrees with the Sheikh in one respect and disagrees with him in another. He admits that none of the metals has extra colour to tincture others; nevertheless he believes that it is possible to give, for example, to the gold the extra colour required to tincture the silver. Similarly, it is possible to increase the tinctorial power of the silver, so that it becomes capable of giving its own white colour to the copper without, however, being reciprocally influenced by the latter. And if all the impurities and accidental qualities of copper were removed, so that it became white like silver, or red like gold, it would then be possible to mix the white copper with silver, or the red copper with gold in such a way that a permanent unity, immune from the smelting fire, is achieved and copper is elevated to the rank of silver or gold. In the same manner, iron may be transformed into either silver or gold. And all this is

1. Tr., p. 20 : Chapter III., (see p. 58 above).

done according to an 'equalizing measure'.⁽¹⁾ Verdigris
 produced from pure copper and also 'saffron of iron'⁽²⁾ may be
 used to impart "a good and permanent colour"⁽³⁾ to silver.
 Lead also may be transformed into silver or gold; 'the black
 lead'⁽⁴⁾ being nearer to Redness and 'the lead',⁽⁵⁾ nearer to
 Whiteness. The ceration of silver, the ceration of gold,
 the coagulation of volatile substances, the extraction of
 sulphur and mercury from molten and purified bodies, and a
 proportionate mixing of these bodies some of them with others,
 are all operations which contribute to the apparition of
 the Red and the White colours. But the Sages, says Jildakī,
 have been reticent and enigmatic in connexion with the question
 of imparting permanent colours, because they have considered
 it to be very important.

Getting back to the original question of Saturn's change
 of omen, Jildakī says that the Sages have not the slightest
 doubt that Saturn is ill-omened in 'the first combination'

1. كل ذلك بميزان التعديل
2. زعفران الحديد : Ferric oxide, $Fe_2 O_3$
3. صبغا صالحا غير منسلخ
4. الرصاص , sometimes الاسرب
5. الانك

and auspicious in 'the second combination'. For it is in the latter combination that 'the two fires', by which are meant the spirit and the soul, join Saturn, which metaphorically represents the earth. And when the earth which consists of two bodies is moistened with the water composed of two natures, the compound, after being heated on a fire of definite intensity, becomes black. This blackness, in contrast with the one which results from the first operation, is auspicious, good, and beneficial to the practitioner of the Art; supplying his needs and rescuing him from poverty. And if so much benefit may be derived from the green fruit of the Art - for we are still at the beginning of the second operation - one could imagine what great riches will result from the acquisition of the ripe fruit. And when a Sage acquires the ripe fruit of the Art; he wastes not one single day, nay, an hour before he starts deriving benefit from it.

The manner of projection of the Elixir and also the problem of weights, says Jildakī, will be discussed in another place in this book. The problem of weights, he goes on, has been discussed by Jābir in his Kitāb al-Mawāzīn (The Book of the Balances), which in itself "consists of one hundred and forty-four books." The accounts given by Jābir are, according to him, at times clear and intelligible,

but in most cases they are obscure and hard to be understood.

The most important part in the Art, Jildakī continues, is the problem of removing the impurities and the accidental qualities, to which Jābir has referred in a number of his books including : K. al-Sab^ea (The Book of the Seven), K. al-Mizāj (The Book of Mixing), K. al-Hudūd (The Book of Definitions), K. al-Mumāṭala wa al-Muqābala (The Book of Similitude and Opposition). His other book, K. al-'Aṣṣād al-Sab^ea (The Book of the Seven Metals), which was mentioned before, "deals partly with the combinations of the parts of the stone and partly with the combinations of the parts of the pure metals." Here again Jildakī praises Jābir and states that neither those who came before him nor those who followed him reached to his eminent position in the Art.

Sheikh: "It is necessary that its incubation should be continued by a gentle heat until the blackness vanishes spontaneously, without any addition in the quantitative way, and the substance becomes white, transparent, shining, easily fusible and miscible and diffusible and soluble and extensible. One part of it will tincture an unlimited amount of the two coppers or the two leads; it will also rectify mercury.

"This is the Elixir of Silver, and forms the first part of the second operation. After this we will begin with the second part of the

second operation, treating it completely and fully, if Allah be willing." (1)

Before proceeding to explain the above passage, Jildakī prefers to say something more concerning the apparition of the black colour. The appearance of blackness, he says, signifies combination and domination of the earth's nature over the three other natures. Now, what is the reason for the appearance of the black colour and why does it prevail over all others? There are, Jildakī explains, four principal colours, namely, white, black, red and yellow. White has the nature of the water, black that of the earth, red that of the air, and yellow that of the fire. And when all the four natures combine, the white colour, "because of its lightness,"⁽²⁾ penetrates into the other three and disappears. The yellow colour penetrates into the red, and the red colour itself moves towards the black, for black is nothing but concentrated red. And that is why in the end the black colour prevails over all others. In this connexion Jildakī quotes a passage from K. al-Mirrih (The Book of Mars) of Jābir in which the latter speaks of the action of 'the agent'⁽³⁾ or 'the

1. Tr., p.32 ; Es., Vol. I., pp. 319-20.

2. اللطيف

3. الفاعل

colourer' ⁽¹⁾ on 'the counteragent' ⁽²⁾ or 'the coloured', ⁽³⁾
 and of their final unification at the completion of combination. In this passage of Jābir, Jildakī discerns the secret of 'the balance', of combination, and of sound constitution. He also thinks that in this passage lies the proof of the soundness of "the science of the Balance". And if the science of the Balance, he goes on, is genuine, there remains no doubt that all the metallic forms are of one single species. The same applies to the parts of the stone, they also are of one species and no more.

Referring again to the extraordinary power of the Elixir, Jildakī invokes the authority of Jābir and quotes him as saying that "The dirham of the balance is one dirham, whereas the dirham of the Elixir is many dirhams." ⁽⁴⁾ A very small amount of the Elixir, says Jildakī, has the power of transforming a large quantity of the base metals into silver or gold.

1. الصابغ

2. المنقول or القابل or منفصل

3. الصبوغ

4. درهم الميزان درهم واحد و درهم الاكبر دراهم كثيرة

As regards the statement of the Sheikh that "It is necessary that its incubation should be continued by a gentle heat until the blackness vanishes spontaneously" , Jildakī comments that this incubation must be carried out in a vessel called ⁽¹⁾amyā, which has a cupola ⁽²⁾ and is specially prepared for putrefaction. The joints of the vessel have to be firmly sealed before it is placed in a furnace, which is specially prepared for the purpose and which is often referred to as "the tombe, the bath, the manure, the well, and the hollow of the earth."

The Sheikh says that the change of colour from black to white is brought about "without any addition in the quantitative way". Jildakī's explanation is that the domination of the white colour is due to one of two things. If a compound is originally white it will exhibit this colour whenever it becomes dry. The white colour appears also when the water dominates the earth, and this is what happens at the present stage of the operation. Now, the drug which is prepared for imparting whiteness to the compound is divided by some of the Sages into three equal parts, and each addition of these parts takes seven days to complete. The

1. See p. 158 above.

2. البية

Sheikh, on the other hand, seems to favour the addition of the whole amount of the whitening drug in a lump, so that in the final stage of the present operation the appearance of the white colour would not depend on another quantitative addition.

The Sheikh, continues Jildakī, did not mention the duration of the first part of the second operation, because he thought that the appearance of the white colour alone is sufficient to denote its completion. And indeed the speed of the operation may be increased or decreased, and it is only with the appearance of the white colour that the end of the operation is marked.

Jildakī believes that the Elixir of Whiteness tinctures copper and iron, and also transforms mercury into the Elixir itself. But as to the two leads, he thinks that the success of projection depends on an additional condition to be observed, to which he would refer in the chapter on the projection of the Elixir.

Vol. I., Book III.

CHAPTER II : Explanation of the second section of the second part of Al-Muktasab, on the manner of the second part of the second operation (this concerns the Elixir of Redness).

Sheikh: "Know, may Allah the Exalted have mercy on thee, that the Elixir of Redness is not directly formed, but must first pass through the stage of the Elixir of Whiteness (i.e. of silver), which has been described previously. Then the stated amount of the moist part is added to it in several [six] (1) portions equal in weight, in such a way that you make no addition to it, meaning the compound, while there is moisture in it, but after it has become dry. After each addition to it a colour will appear, until at the sixth it becomes fixed in the colour of purple, and is waxy, fusible, soluble, stable. One part of it (is capable of transforming into gold)(2) a thousand parts (of mercury which has been fixed by means of the Elixir of Silver).(3) Similarly if you wish to project it upon silver it will turn it into pure gold, more precious than the gold of mines.
 "When it behaves in this fashion [our delight is justified] (4) our cultivation and reproduction have been correct, and we are indeed successful sages."(5)

"The things", explains Jildakī, "do not reach their destination except by natural degrees. Similarly, it is not possible to produce anything from anything fortuitously, nor is it possible to dissolve anything in anything casually.

1. Pt. : **مت و نفاك** ; Es. : **مت و نفاك**

2, 3. The parts between parentheses do not appear in Es., but they appear in Pt.

4. Does not appear in Pt.

5. Tr., p.32 ; Es., Vol. I., p. 325.

The things are, indeed, akin to their likes and oppose their unlikes." The Elixir becomes red only after it has been white, and it became white, we remember, after it had been black. And blackness in turn was preceded by whiteness. All these colours originate from the mixing of two things, namely, moisture and dryness. And the completion of each stage of operation is marked with the appearance of a particular colour. 'For the appearance of colours is due to (the effect of) the quality on the quantity and not to (the effect of) the quantity on the quality.'⁽¹⁾ By 'quality' Jildakī means a thing which is not divisible, such as heat, moisture, etc. 'Quantity', on the other hand, is divisible and possesses a body. Quality is active and contributes the form, whereas quantity is passive and supplies the material substance.⁽²⁾

The addition of moisture, continues Jildakī, must, as a rule, be gradual. But in the first part of the second operation it is permissible to add the moisture in a lump or divide it into three equal parts and make the addition as usual by degrees. The reason why it is possible to add the moisture altogether at once in the first part of the second

1. لان الالوان تظهر من الكيف في الكم لا من الكم في الكيف

2. See pp. 11, 12 above.

operation is that the compound at that stage contains an additional amount of heat accumulated during the course of the operation, which causes the moisture to be absorbed fast enough to prevent corruption, which otherwise generally ensues. The Sages are at variance with each other with regard to the number of parts into which a definite portion of the moisture added at a certain stage of operation should be divided. Nevertheless they all obtain the same result and arrive at the same conclusion; for, unlike the stupid people, they know exactly what they are doing. By the end of the first operation three portions of the moisture have been used, each equal in weight to the dry part or the earth. These three portions were added to the dry part on ten different occasions. The third portion, for example, was divided into seven parts, each of which was added at a certain stage of the operation. Similarly the amount of the moisture used in the second operation is divided into ten parts, three of which are consumed in the first part of the operation, either in a lump or by degrees on three occasions. The seven remaining parts are added in the second part of the

1. Jildakī says that some of the Sages are in favour of dividing the amount of moisture into seven parts.

2. According to the Sheikh, there are only six parts of moisture which are added in the second part of the second operation.

second operation, after the formation of the Elixir of Whiteness. The object of the first operation is the dissolution of the dry part and the removal of impurities, whereas the object of the second operation is coagulation. Therefore, if an inadequate amount of moisture is used in the first operation, dissolution will not be complete. On the other hand, the use of an excessive amount of the moisture in the second operation prevents complete coagulation.

After each addition of the seven parts of moisture in the second part of the second operation, a new colour appears. The first colour to appear is yellow, the last is purple and the rest fall in between these two. Each new part of moisture is added only after the complete consumption of the previous one and the desiccation of the compound. Jildakī quotes here several poems from Ṣāhib concerning the change of colours. He says that anyone who desires to understand the true meaning of the poems of Ṣāhib must refer to "one of my books called Gāyat al-Surūr, which contains twenty-eight chapters arranged in alphabetical order." He wrote this book because he noticed that those who explained the poems of Ṣāhib were wrong in the major part of their interpretations. Jildakī praises Ṣāhib, saying that he combined "the eloquence of the poets with the

wisdom of the philosophers."

When the last part of moisture, continues Jildakī, is added to the compound, the latter dissolves completely and becomes a blood-like fluid. The important thing is that this fluid takes a comparatively long time to coagulate. One has, therefore, to be very patient and careful, for otherwise if one intensifies the fire out of proportion in order to shorten the duration of the operation, 'the natural soul' may fly away before it is fixed by coagulation. The same thing happens when gold, before it is coagulated and matured, is taken out of its mine and subjected to great heat, whereupon its soft part volatilizes and corruption ensues. Whereas if it is left in its mine until its coagulation is complete and until it is fully matured, the smelting fire will have no effect on it whatsoever.

At the present stage, therefore, the compound must be subjected to a very gentle fire for a comparatively long period of time, until its coagulation is complete. The fire is then gradually intensified until the compound becomes like molten wax, after which the intensity of fire is decreased, the aperture on top of the vessel is opened "for three hours in daytime" to let off the steam, and the compound is left alone to solidify. Thus the Elixir of Redness is produced, and it only needs to be washed before

it is finally employed for the purpose of transformation. Only a small number of the Sages, according to Jildakī, have referred to the last process of ablution, the Sheikh being among those who made no reference to it. Jildakī mentions the process of ablution in order to make his book complete.

As regards the duration of the different stages of 'moistening',⁽¹⁾ Jildakī goes on, Al-Ṭuḡrā'ī has referred to it in his book, Tarākīb al-'Anwār (The Combinations of Lights), by way of allegory. Similarly Buyūn al-Barhamī in his Risāla (Treatise) mentions it in enigmatical terms. "I am surprised at it : the way it drank five diverse parts in forty years after its vehement thirst, and a single part in 40,000 days and $2\frac{1}{4}$ years."⁽²⁾ Jildakī leaves the interpretation of the Buyūn's statement for another occasion and proceeds with his explanation of the Sheikh's words.

The gold of the philosophers is better, he says, than the gold of mines, for it has more tinctorial power: every twenty-four qīrāts of the philosophers' gold is equal in strength to thirty-four qīrāts of the gold of mines.

1. التمانى

2. Es., Vol. I., p. 335 :

عجبت منه كيف شرب خمسة من الأجزاء المنفردة في أربعين عاماً بعد مدة عطشه و
جزءاً واحداً في أربعين ألف يوم و عامين و ربيع عام .

Referring to the statement of the Sheikh that "our delight is justified," Jildakī discusses at length the similarity between the Elixir of Redness and the operator when he has just produced it. Delight, says Jildakī, is associated with laughter and laughter is caused by the rush of blood from the small cavity of the heart to the surface of the body. So when the compound turns red, the face of the operator also becomes red. And just as a sudden occurrence of delight or joy and excessive laughter may be fatal, so an improper use of the product of the Art may cause death and destruction. This ensures that no unworthy person shall ever come into possession of the noble product of the Art. In this connexion Jildakī quotes a couplet and a quatrain from 'Ibn al-Nabiyya, and as usual several poems from Ṣāhib.

Sheikh : "And if you wish to stop here you may. But if you wish to increase it in quantity and quality, then you should have moisture in excess or extracted from another earth. If the red elixir is moistened with this it will increase in quantity and in quality, that is, in action; and its power of projection is multiplied many times in every addition of moisture, with no limit - (as the other Sages have said, 'It will increase endlessly, and will increase endlessly in tinctorial power')⁽¹⁾. And concerning this they said, 'One mithqal

1. The part between parentheses does not appear in Es.

of it is sufficient for all which lies between the East and the West¹

"And concerning this again, Marianus the Sage said to Khalid ibn Yazid : Know O Emir, that it increases without end (in quality and in tinctorial power)⁽¹⁾

It is an established fact in the Art, explains Jildakī, that the water increases endlessly the power of the Elixir of Redness. A couplet Jildakī quotes here from Ṣāhib supports the opinion of the Sheikh that one part of the Elixir of Redness is capable of tincturing a thousand parts. Another couplet quoted from the same author conveys a meaning contrary to the first. Jildakī believes that this contradiction is superficial and he promises to deal exhaustively with the problem of multiplication of the Elixir in the third volume of his present book. He quotes also a quatrain from Ṣāhib in support of the view expressed in the first couplet, and that concludes all he has to say concerning the above excerpt from the Sheikh.

Sheikh: "But we will not speak further thereon in this place, so let this be the end of the second part of the second operation, and its completion finishes the quantitative and the qualitative."⁽²⁾

1. Tr., pp. 32-3; Es., Vol. I., pp. 338-9. The part between parentheses does not appear in Es.

2. Tr., p. 33 ; Es., Vol. I., p. 340.

The Sheikh, explains Jildakī, has employed an elegant method in his exposition of the Art. The following is the order in which, according to Jildakī, the Sheikh has presented his theme:

1. Description of the subject-matter of the Art. "The Sages are in the habit of describing the science on which they are going to talk."

2. Arguments proving "the soundness of the science and the possibility of the Art."

3. The materials of the Art, i.e. the substances from which the Elixir is produced.

4. Points of resemblance between the Art and other branches of science.

5. "Point of resemblance between the Art, the act of reproduction and the process of Nature."

6. The first hidden quantity and the first hidden operation.

7. Division of the whole operation into four main parts and explanation of each part according to the order of precedence. The four parts are as follows:

"a) From the beginning of the marriage to the end of the union and the first dissolution before decomposition;

b) From the beginning of distillation, the extraction of the moisture and its reintroduction in an

increased amount to the end of decomposition and the appearance of the crown. Then the new earth is disintegrated and tilled in order to be made capable of combination;

- c) From the beginning of the second combination to the end of the revolution of the moon and the maturity of the Elixir of Whiteness;
- d) From the beginning of the last moistening to the end of the production of the Elixir of Redness.'

A few general hints concerning the multiplication of the Elixir of Redness, continues Jildakī, complete the account given so far by the Sheikh. The latter has left nothing untold in the Art so far as the principles and the main problems are concerned. As to the details, Jildakī has discussed them in his present book, because he considered it impossible for anyone except a Sage to understand the minor points by studying merely the principles.

Sheikh: "Next we will begin the quotations in evidence from the Sages, section by section and part by part, shortly and concisely." (1)

Now, explains Jildakī, that the eminence of the Sheikh,

1. Tr., p. 33; Es., Vol. I., p. 341.

the excellence of the method employed by him, and the orderly manner in which he presented the Art have all been pointed out, it would be appropriate to underline the importance of his references to other Sages. For it is in this way that he tried to prove the soundness of his own arguments. All through his book he tried to be brief and concise, and for this reason even if he had been open and straight-forward in all his assertions, there would still have been a need for a commentary to elucidate his words and to make clear his intentions.

Sheikh: "Know that I have been brief in this book, in order to be clear therein. And I have made it free from irrelevant matter and falsity and allegory. I have expressed myself plainly on the qualitative and the quantitative parts and on the prime matter, and have fulfilled the obligation laid upon me since I have not used allegory to tantalise thee. Praise be to Allah, the Glorified and Exalted." (1)

It is quite true, comments Jildakī, that the Sheikh was 'brief' in his arguments and made them "free from irrelevant matter and falsity." This does not apply to other Sages "who are in the habit of presenting the false as true and giving to the true the appearance of the false." That is why only an intelligent and experienced person could

1. Tr., p. 33 ; Es., Vol. I., p. 342.

understand the real meaning of the words of the Sages and to disentangle the true elements in them from the false ones. It is like "separating the essential parts of the stone from its worthless shells." In contrast with other Sages, the Sheikh spared the readers the trouble of winnowing truth from falsehood; for nothing that he said was either irrelevant or mendacious.

His words, continues Jildakī, are also free from allegory, although one must remember that he addressed Sages like himself and it is from their point of view that his arguments do not seem allegorical. "For there are allegories in some of the chapters of his book; we pointed them out to you in the previous pages of our book and shall do the same in what follows next."

The words "I have expressed myself plainly" in the above quotation from the Sheikh are the English equivalent of the Arabic term ⁽¹⁾ 'a^erābtu, which with an additional dot will be read ⁽²⁾ 'agrābtu, meaning "I have put away" (lit: I have gone towards the west). Jildakī says that the omission of the dot from the Arabic term in question as it appears in the above quotation must not deter us from recognition of the fact

1. اعربت

2. اغربت

that the second reading is more plausible. The reason for this is that the prime matter, the quantitative and the qualitative parts constitute the three principles, his information about which the Sheikh had no intention of communicating to stupid people; and he therefore "put them away" or removed them from their sight. But, so far as the Sages are concerned, the Sheikh did not conceal anything from them, and he indeed expressed himself plainly, not only on the above-mentioned principles, but also on other matters.

Epilogue to the First Volume

'Know,' says Jildakī, "that we showed to you the most perfect way and adduced the most lucid arguments. We disclosed in this our commentary things mentioned by no one. Not a single person among the practitioners of the Art, the ancients as well as the moderns, ever composed anything similar to it. We have adopted the Sheikh's method of investigating, of establishing the true, of omitting the false, and of rejecting allegory. We have also explained things about which neither he nor other Sages were clear. We notified you of the difficult points and did not spare any advice or explanation as far as it was incumbent upon us. So when by studying our words you attain the end which you had in view, be thankful to God who delivers you the thing

for which we exerted ourself strenuously for years and spent the most precious part of our life and property in order to secure it. And reward us, in public as well as in private, for the pains we took for your sake by having mercy upon us, giving alms, bestowing bountiful gifts, rescuing the broken heart, being generous to the needy and particularly to one afflicted with palsy. Make no tyrannical demand upon people, honour the students of philosophy, and keep away from ignorant folks. God has shown favour towards you, so be among those who do not betray His secret and you will be successful. Make humble entreaties under all circumstances to God the Exalted, and know that this world is transitory and He is the sole arbiter Who gives us whatever He pleases here below and hereafter. Verily, He is powerful over whatsoever He wishes.

"Thus we finish the first volume of the book. God is helpful, praise and grace be to Him perpetually and eternally until the day of Justice. May His blessings be upon our lord and master Mohammed and his family, upon 'Alī and all the prophets, divine messengers, angels, and pious people. Praise be to God, the Lord of the two worlds."

VOLUME II.

IN THE NAME OF GOD, THE COMPASSIONATE, THE MERCIFUL!

The opening words of the second volume of Nihāyat al-Talab are devoted to the praise of God, Muhammad, and the latter's family and companions. Following that, Jildakī cautions the reader, as he did on many occasions in the first volume, against breaking the rules of secrecy in the Art. The kings also, particularly the blunt-witted and bull-headed ones, "like the kings of the present day", must be kept in the dark as regards the secrets of the Art. For wealth plays an important part in the reign of every monarch, it consolidates their position, and ensures the loyalty of their supporters and the obedience of their subjects. Jildakī quotes from K. al-Ahjar (The Book of Stones) of Al-Bīrūnī in which the latter says that the kings try their best to lay their hands on the sources of wealth wherever they could find them.

The desire for the possession of wealth, says Jildakī, is not confined to the kings; it is cherished by all people. And that is why, he goes on, a Sage who does not keep silent is in constant danger of being deprived of life by those who are incited by greed and jealousy. The Sages themselves do not employ their knowledge in order to increase their wealth, for material prosperity has no attraction for them. In support of this view Jildakī quotes a couplet from Ṣāhib and two others from Abū al-ʿAṣbağ ʿAbd al-ʿAzīz ibn Tammām al-ʿArāqī. He then quotes a passage from the author of Kanz al-Hikma (The Treasury of Philosophy) in which the latter comes out in support of the arguments

favouring the observance of secrecy in the Art. Everyone, he says, who intends to be initiated into the secrets of the Art should rely mainly on his own efforts. The method of instruction, according to him, ought to be private and the lessons must not be attended by more than two persons, both of them learned philosophers, one of whom knows the secrets of the Art and the other desires to know them. Jildakī confirms these views and adds that in order to make sure that the knowledge of the Art is not transmitted to those who are not worthy of it, the language in which it is expressed must be cryptic and obscure - obscure, not of course for the learned people, but for the stupid folk.

Jildakī says that he followed in all his works the example of other Sages and expressed himself in such a manner that would make it impossible for the malicious, ignorant person to understand his real intentions. Referring to his present book, The End of the Search, he says that he mentioned in this things which may not be found in his other books, except four of them, namely, 1. Šams al-Munīr (The Luminous Sun); 2. Ġāyat al-Surūr (The Utmost Limit of Delight), on the Dīwān (Poetical Book) of Šāhib; 3. Šarḥ Šahīfa Hirmis al-ʿUzmā (Commentary on the Book of Great Hermes); and 4. Durrat al-Muḍiyya (The Bright Star), a commentary on K. al-Māʿal-Waraqī (The Book of Silvery Water). The first two of these, Jildakī considers to be as important as The End of the Search, and anyone who studies the three of them will be in complete possession of all the principles and secrets of the Art. As for the rest of his books, including his K. Sirr al-Maṣūn (The Book of the

Guarded Secret), a commentary on the Risāla (Treatise) of Buyūn al-Barhamī, each one of them serves a particular purpose and is devoted to the explanation of certain aspects of the Art, these books are more technical and are written only for the benefit of the Sages.

In most of his books, Jildakī, according to himself, made references to The End of the Search. He says the Sages are in the habit of attaching a special importance to one of their books to which they often refer in the rest of their works. The End of the Search occupies the same eminent position among the works of Jildakī as The 500 Books among those of Jābir, Kal-Masābih wa al-Mafātih among those of Al-Ṭugrā'ī, K. al-Rutba among those of Al-Majritī, and K. al-Misbāh among those of Ibn'Umayl.

Prologue to the Second Volume

The prologue to the second volume of The End of the Search is extremely short and occupies only half a page of the MS. Here Jildakī reiterates his previous statements concerning the method employed by the Sheikh and the purpose of his references to the works of other Sages.

Vol. II., Book I.,

CHAPTER I : . Explanation of the first section of the fourth part of Al-Muktasab, upon evidence concerning the unity of the essence from which the form of the Elixir is prepared.

Sheikh: "Verily we will preface this by explaining for the seekers the hints of the philosophers concerning it. Know, that words indicate meanings. The meanings are the things named, while the words are the names. The commonest word is our phrase 'a thing'. Now the thing may be either one or more than one, while the word one may be used in two ways, (a) literally, and (b) metaphorically. Cne in the true sense is that which has no parts, while one metaphorically may be

the whole of a collection, which is called one. Thus you speak of one decade or one hundred or one thousand. And one is one by definition, just as black is the description of blackness by definition.

"Understand this preface, therefore, for indeed it is an important part of this Science, and if you know it, you will be able to comprehend the allusions of the Sages" (1)

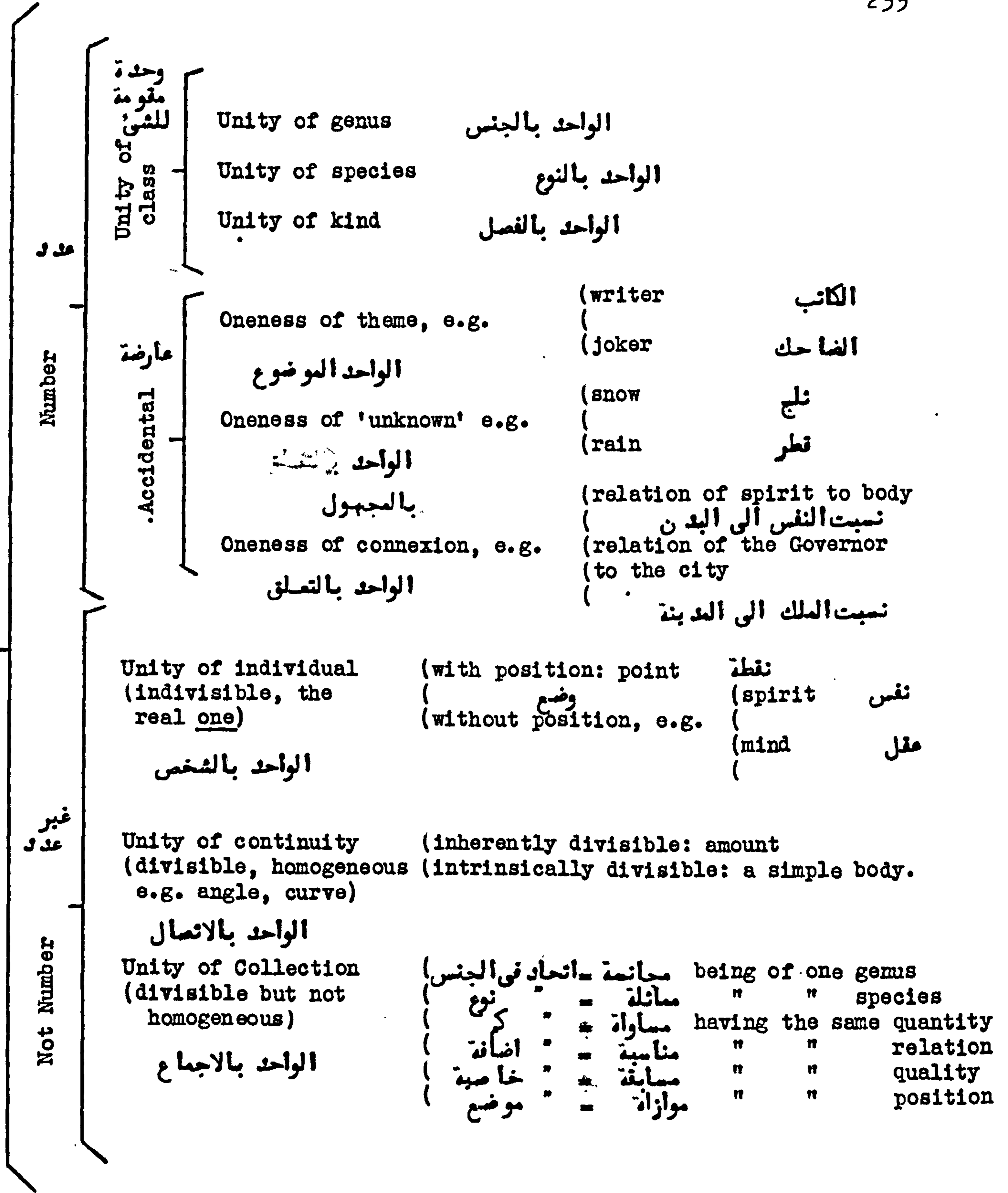
The Sheikh, explains Jildakī, considers the word one to be instrumental in understanding the allusions of the Sages. Among the Moslim nations, he goes on, the word one conveys two meanings: it denotes the first number and also that which is not divisible. The former philosophers thought that "the real one is God, the Exalted" and denied that it implies indivisibility. Jildakī then enters into an elaborate discussion about the word one and its different shades of meaning. A tabular representation of his views in this connection appears on the next page.

When the Sages say "it is one", continues Jildakī, they do not mean that "it is the real one", for there is no means of establishing the truth of this proposition. Similarly they do not mean that it is one in the metaphorical sense, for the materials used in the Art are capable of disintegration and combination. What they usually mean is that it is of one genus, or one species, or of one kind. The majority of the Sages do not consider 'one decade' or 'one hundred', or 'one thousand' to be one, but some of them do. It is the same with 'troop' 'blackness', 'redness', or 'whiteness'.

1. Tr. pp. 33-4; Es., Vol. II., p. 7.

الواحد

The One



From what was mentioned before we understand that the central theme of the Art is concerned with 'a number' of "fusible, malleable, metallic bodies" which are "of one real, and not relative, species". As regards "the stone of the philosophers" or "the material of the Art", it is not of one genus; for, if it were, it would consist of 'diverse things'. Similarly, it is not of one 'individual' substance, for, if it were, it would be either hard and earthy or soft and spiritual, not both. And as we know, a hard and earthy substance is not capable of decomposition, while a soft and spiritual one has no stability. In short, when it is said that the stone is one, it means nothing else except that it is of one species.

But when it is said that the stone is of two, it means that it consists of "earth and water, moisture and dryness, male and female". It is also "of three: water and oil and dregs, soul and spirit and body; of four: water and oil and holy earth and new earth, fire and water and air and dust, hot and cold and moist and dry; of seven, i.e. of three plus four; of twelve: the six young girls plus the four couples plus the male and female; of sixteen: four natures plus four elements plus four humours plus four principles. We know what the natures and the elements are, but as to the humours, they are: blood, yellow bile, phlegm, and black bile. As to the principles, they are: western mercury, eastern mercury, volatile sal ammoniac and stable earth" (1)

1. Es., Vol. II., pp. 10, 11.

Sheikh: "Heraclius said to one of his pupils: 'As for (its state) in the beginning, verily it is from one root, and while in the later parts it is diversified, yet at the end it becomes again one single thing' "(1)

Heraclius, explains Jildakī, is talking about the raw material of the Elixir, to which the Sages have given many different names. Here Jildakī quotes a poem from Hālid, in which the latter speaks of 'the pure gold', 'the white silver', and 'the stone', saying that in them lies the secret of the Art. They are three, says Hālid, but it is also true to say that they are five or seven; God "created them in the hollow of a vessel which has neither length nor width". Hālid, comments Jildakī, did not mean as the stupid people would like to imply, that 'the pure gold', 'the white silver', and 'the stone' are three different things. On the contrary, by these three names he referred to one and the same thing, i.e., the raw material of the Elixir. The Sages are in the habit of referring to this material by the different names which are given to it in the course of the operation, when its form changes from one to another. And there is no doubt that pure gold and white silver, that is, the gold and silver of the philosophers, which in contrast with the ordinary gold and silver have plenty of tinctorial power, are potentially present in the raw material of the Elixir. The vessel "which has neither length nor width", is a sphere, for it is obvious that we do not speak of the length or the width of a sphere. This implies, Jildakī goes on, that Hālid rejected the idea of generation from 'egg', for egg is not spherical. Again, the

1. Tr., p. 34., Es., Vol. II. p. 11.

rejection of egg implies that the raw material of the Elixir is not taken from the animal or the vegetable but from the mineral kingdom.

To prove his point, Jildakī, as usual, quotes a poem from Sāhib, in which the latter says that the raw material of the Elixir is not to be found in the 'egg of bird', nor in the 'hard stone' or 'tender tree', it is from a 'golden tree' hidden "in a slender ivory vessel", which lies at the bottom of the 'two seas', one of them 'white' and the other 'dark red'.

Sheikh: "Pythagoras said: 'just as all things originate from the One, so this Art is from one thing and one essence only. And just as in the body of man there are four natures (which Allah created) gathered together in one body, each of them performing a function different from that of the others, and each having definite equilibrium and colour and power, so is this thing'. And some of the evidences of the Sages are on this wise, so follow them". (1)

"Know", explains Jildakī, "that Pythagoras was the first teacher among the Sages, for he derived his knowledge from Hermes ⁽²⁾ and explained the words of Enoch, peace be upon him, who is Hermes Trismegistus. But this did not satisfy him, he exerted himself strenuously until he soared high and heard the movements of the spheres, producing sounds the like of which may not be heard here below. He then invented for the people the science of music and made instruments, which produced sounds similar to those he had heard. He taught philosophy, he believed in the unity of God and prayed to Him, and he was called the first teacher. It is said that Pythagoras, Socrates and Plato

1. Tr., p. 34., Es., Vol. II. p. 15

2. See pp. 385-6 below.

were prophets, God knows whether they were or not. But his words mentioned above prove that he believed in the creation of the worlds and the oneness of God". The Elixir, Jildakī goes on, has the same relation to its raw material as the man has to the sperm or the date to the date-stone, from which they originate. And just as there are four natures in the body of man so there are four natures in the stone.

Sheikh: "Marianus said to Khalid ibn Yazid: 'As for the question concerning the Root, "Is it from one thing or from diverse things? verily it is one thing and one root and one essence and one species, to it there is nothing added and from it there is nothing removed' " (1)

'It is one thing', said Marianus, and he meant, explains Jildakī, that it is one thing in the metaphorical sense, "for it is from the mine of philosophy". It is 'one root', he said, and he was right, "for its root is the vapour and the smoke". It is 'one essence' he said, and he was right, "for it is from moisture and dryness combined, and its essence, therefore, is one after the first operation".

"To it there is nothing added and from it there is nothing removed", he said, and he was right, for everything which is added to it, such as water, oil, or earth, is derived from itself.

Sheikh: "Heraclius said to one of his pupils: 'Verily the date-stone comes from the date-palm, and the date-palm comes also from the date-stone, and from the kernel the tree grows and many branches grow out from its root' " (2)

1. Tr. p. 34; Es., Vol. II. p. 17.

2. Tr. p. 34; Es., Vol. II. p. 17.

"Know", explains Jildakī, "that gold originates from steam and smoke, and these in turn originate from the philosophers' gold. Thus, from steam and smoke are produced mercury and sulphur, and from these gold is originated in its mine. And just as it is possible to produce steam and smoke from the philosophers' gold, so it would be possible to produce from the two latter, the Elixir. Understand, therefore! And for this reason the Sages said 'If mercury is continuously heated with a gentle heat, it becomes gold, and if gold is continuously heated with a gentle heat, it becomes mercury again. Just as the date-stone comes from the date-palm, and the date-palm comes also from the date-stone; and from the kernel the tree grows and many branches grow out from its root'. And similarly from the root of the philosophical tree sprout its branches and its boughs, just as all the minerals, fusible metals, and meltable, crumbly, brittle bodies originate from mercury and sulphur. Know this, and do not think that by the philosophers' gold we mean the ordinary gold" (1)

A person who is not acquainted with the teachings of the Sages, continues Jildakī, falls easily into error because of the similarity of names given to different substances. Gold, as was mentioned before, is a name which the Sages give 'to every pure principle' and also to that in which gold or the Elixir is potentially present, i.e. the stone. "The despised gold" (2) is the impure form of the philosophers' gold, which because of its uselessness is thrown into the streets. But, if

1. Es., Vol. II. pp. 17-18

2. ذهب المحفور

its impurities are removed, "it becomes the purple gold, the red sulphur, the unflammable oil, the eastern mercury, the abounding spirit, the natural heat, the red blood and the like".

Sheikh: "Similarly, Hermes Trismegistus said: 'O Sages! consider the red which is perfect and that which is imperfect, and the perfect yellow and that which is imperfect, and the black which is perfect and that which is imperfect - each one of these is from one root' "(1)

"These words", says Jildakī, "may be interpreted in two ways, one with regard to the science of the Exterior and the next concerning (that of) the Interior. In the (science of) the Exterior, the perfect red is gold, the imperfect red is copper, the perfect yellow is sulphur and the imperfect yellow is arsenic, the perfect black is the black lead and the imperfect black is iron. Whereas in the (science of) the Interior, the perfect red is the Elixir and the imperfect red is the tincture, i.e., red sulphur, the perfect yellow is the new body prepared by decomposition and rectification mentioned before, the imperfect yellow is the raw body, the Ṣafīḥa, ⁽²⁾ the ābār, ⁽³⁾ the pure arsenic, and the laminated gypsum, ⁽⁴⁾ the imperfect black is magnesia in the first combination, the perfect black is the perfect compound in the second blackening. And all these things originate from one root, namely, the volatile, ⁽⁵⁾ the soul, the bird, ⁽⁶⁾ the

1. Tr., p 34., Es. Vol. II. p. 19.

2. الصفيحة : lit. slate; thin plank, wide or broad stone.

3. ابار : "Burnt lead (good for wounds and bruises)", Persian-English dictionary, F.Steingass, London 1947.

4. الطلق الصفح

5. ابق

6. الطائر

water, or the coagulated steam, the fluid gum, the white of the round egg. So understand!" (1)

Sheikh: "Sergius ⁽²⁾ the Monk said: 'Consider the tailor, how he takes one piece of cloth and cuts it up part by part and makes from it body and sleeves and gores and hem, then combines them after that and reconverts them into one thing. In the same way, this our Art is from one thing, hidden and treasured with the Sages, who deliberately keep it secret from the ignorant. And they have named it with the best of names and it is placed in the most noble of places. It is both hidden and displayed; the wise know it and honour it, while the ignorant fools despise it and treat it with contempt' " (3)

"Know", explains Jildakī, "that in this Art all other arts are potentially, or actually, or virtually, or nominally included. And for this reason it is called the craft of the crafts ⁽⁴⁾ and the art of the arts". Cultivation, marriage and reproduction, medicine, arithmetic, surveying, geometry, astronomy, law, science of war, horsemanship, knitting and weaving, tailoring, slaughtering, cookery, grain milling and kneading, iron smithery, copper smithery, dyeing, craft of jewellery, glass making, pottery, art of washing and bathing (other people in public baths), art of imprinting figures on

1. Es., Vol. II., pp. 19-20

2. Pt. سرجیس ; Es. برجیس (lit. Jupiter)

3. Tr. p. 34; Es., Vol. II., p. 20.

4. Or 'professions of the professions'

cloth and of embroidery, commerce, carpentry, building, music, "in short everything in the world," says Jildakī, is in one respect or another included in the Art. The resemblance between the Art and cultivation was fully discussed in the first volume. Just as marriage requires a male and a female partner, so does the Art; in marriage as well as in the Art there is reproduction, nursing, and nurturing. Medicine has as its aim the healing of diseased human beings. A medical man must know all the properties of the simple and compound drugs which he prescribes; he must also know about the age, the habits, the natural disposition, the strength, and the pulse of his patient. He must then find out about the nature of the disease by making an examination of the symptoms. Finally he has to decide on the kind and the quantity of the drugs which the patient must take in order to be restored to health. Now, all this has its parallel in the Art. The purpose of the Art is to cure the diseased metals, remove their accidental qualities, and make them perfect and healthy. This means that the man of the Art must have a thorough knowledge of the nature of metallic diseases, of the drugs employed in the Art, their weights and their properties.

The art of arithmetic, Jildakī goes on, is concerned with numbers, their multiplication, division, squaring,

extraction of their second or third root, 'restoration and comparison', ⁽¹⁾ etc., Now all these operations are performed in the Art, for the weights of the drugs are represented by numbers. Geometry deals with the properties of lines, angles, surfaces, etc.; so does the Art, for the man of the Art has to know about the shape, or the area, or the volume of the apparatus and furnaces with which he works. Astronomy deals with stars, heavenly bodies, 'suns', 'moons', their rising and setting, the period of their revolution, their conjunction, opposition and quadrature, their eclipses, when they are ill-omened and when auspicious etc. And all these have their counterparts in the Art. In connection with the resemblance of the Art to the science of war, Jildakī quotes a poem of Sāhib, in which the latter describes the stages of the operation as if he were reporting the progress of a battle.

In weaving, Jildakī continues, we first divide the yarns into warps and wefts and then bring the two together and make the cloth. The same thing is done in the Art, that is, we break the material into two parts at the beginning and combine them again in the end. The same thing is true of tailoring; for here also there is a

1. Al-jabr wa al-muqābila

الجبر والمقابلة

separation at the beginning and a combination in the end. The purpose of slaughtering and cooking is to provide food for the consumption of human beings. Not every part of a slaughtered animal is consumed as food; skin and bones, for example, are removed, and only flesh and fat are eaten. Now as was mentioned before the preparation of food-stuff, its purification, and the extraction of its choice part is an indispensable operation in the Art. The art of grinding, leavening and kneading also resembles the Art; for in the Art we have to pound the drugs and knead them with the water at the beginning of the operation as well as in the end; we have also to leaven the compound at the end of the first operation and also at the end of the second operation. As to the art of smithery, it deals with the metals, and so does the Art.

The Art resembles also the craft of jewel making; for it is possible, to give an example, to dissolve the small pearls in 'the sharp water' and then by the use of 'the divine water' and by coagulation produce large, priceless gems. It is also possible to transform glass crystal into ruby or other precious stone and thus make very valuable vessels of different shapes and forms. Jildakī promises to discuss this matter more fully in the third volume of his present book.

The art of pottery and glass making is included in the Art; for some of the apparatus, with the help of which the operations are carried out, are made from glass or clay. The art of bathing (other people in public baths) is also included in the Art; for washing or purification of the drugs is an important operation without which it is not possible to produce the Elixir. The art of printing figures on cloth is similar to the Art; for in both of them, the appearance of colours plays an important part. Music resembles the Art; for in the course of the operation very agreeable tunes are produced, such as the sound of dripping water in distillation. Commerce, carpentry, building, in short every kind of craft, art, or profession resembles the Art in one way or another and is, therefore, included in it "potentially, or actually, or perceptibly, or virtually."

Referring to the words of Sergius that "the wise know it (the stone) and honour it, while the ignorant fools despise it," Jildakī says that here the stone does not mean gold, which is honoured by all people, wise as well as ignorant. In this connection he quotes a passage from Dun-Nūn al-Misrī, in which the latter says that the Sages are in the habit of giving the name stone to various drugs

used in the preparation of the Elixir or even to a certain part of the stone. The reader, comments Jildakī has to find out for himself what the term stone implies in different contexts.

(1)
Sheikh: "And these things are many. [And these names], they mention them in their books and make mention thereof on their volumes.

"Have you not considered the sperm and its change into blood, then into a tiny piece of flesh, then into the embryo, and then into form after form until it becomes a complete man? Yet that which would explain its growth and properties is not seen until it has attained its final stage.

"Of the same sort are lead and wheat and milk, and many other things - they are all one thing at first, and then are changed by treatment and given many new colours and names and natures" (2)

The Sheikh, explains Jildakī, wanted us to understand the secret part of the Art, not, of course, by describing that part in plain words, but by giving us examples, by explaining for us the laws of philosophy, and by way of comparison. He drew a parallel between the gradual development of the sperm into man and the progressive conversion of the raw material into the Elixir. After repeating the Sheikh's statement concerning the consecutive forms into which the sperm gradually develops, Jildakī adds that, while the child is in the womb it is fed on menstrual blood, but after its birth this blood transforms in the breast of the woman into milk, which constitutes the sole food of the young. Man, continues

1. Pt: وهذه الاشياء كثيرة ; Es. وهذه الاسماء

2. Tr., pp. 34-5; Es., Vol. II., p 27.

Jildakī, is potentially present in the sperm, and so is the Elixir in its raw material. The prime matter of the Elixir, its raw material, is operated upon until an extract resembling the sperm is derived from it. This 'mineral sperm' is then placed in a vessel which acts as a womb, and at every stage of operation it changes its shape, colour, taste, smell, in short, all its properties and is accordingly given different names, until in the end it develops into the Elixir. "Every thing which is born",⁽¹⁾ such as lead, wheat, milk, undergoes a similar process of transformation and passes through analogous stages of development, changes its shape, colour and all other properties, and finally reaches its predestined state.

Sheikh: "And Ares said to Caesar: 'O Caesar, the first thing which caused men to fall into error was the multitude of names, but as for him who knoweth that (these names) referred to colours which appear, verily he will not go astray from the path.' He asked him also and said: 'Expound unto me concerning these colours which change from colour to colour; are they from one compound or from various compounds?' He said: 'Nay from one compound and one thing; and as often as the fire gives it a new colour we give it a new name' " (2)

The multiplicity of names, explains Jildakī, is indeed confusing, but this does not appear as an insurmountable obstacle to an intelligent person, though it leads astray the ignorant fools. "There is no doubt that the operation of the Sages is one", but there are different stages in it.

1. جميع المولات : All things.

2. Tr., p. 35; Es. Vol. II., p. 29.

The consecutive stages of the operation are "decomposition (or dissolution), separation, combination, dissolution, and coagulation".

Here Jildakī quotes a couplet from Ṣāhib:

"There are two coagulations, so there need be two dissolutions,
Therefore, dissolve it and coagulate, then dissolve it and coagulate again"

The first coagulation, comments Jildakī, which was not mentioned above, takes place before the first dissolution; it precedes 'the first blackness'. Further, there is another dissolution, which is included in 'the first concealed operation' and takes place prior to the first coagulation. In another couplet quoted from Ṣāhib it is said that there are 'two blackenings' and 'two whitenings'. Jildakī adds: "Know that every blackness is followed by dissolution, and every dissolution by whiteness".

Sheikh: "Zosimus said to Euthasia: 'I would cause thee to know that the Sages did not make their speech obscure and the operations manifold except to repel the ignorant. But those of them who are familiar with the multitude of operations which they mentioned and described in their books do not need more than one operation, one work and one way. It is thus with all the sayings of the Sages; although they diversified the names and descriptions, they nevertheless meant thereby only one thing, one way and one operation. So ask not for further proof after this. For indeed, the Sages mentioned compositions and operations and weights and colours in profusion, rendering them obscure in order to mislead men; but they lied not' " (1)

Jildakī begins here by saying that to him has fallen the task of explaining in detail what other Sages expressed in general terms. He has, therefore, tried to subject the words of the Sages to a sort of winnowing process, retaining what is worth having and disposing of what is useless. This he has done with the intention of saving the readers of his books from suffering heavy losses of time and property. Contrary to the other Sages who, he says, in order to deter the ignorant

1. Tr., p. 35. Es., Vol. II., pp. 30-1

fools, gave only a partial proof of their arguments, he has supported all his statements with irrefutable and complete proof.

The reason why, Jildakī goes on, the Sages described so many operations was that in the first place they wanted to give their readers as much information as possible concerning the properties of the substances used in the Art. And secondly, in every description of an operation they included a true proposition, which, if understood, would take the reader one step nearer to the heart of the matter. Anyone who is not familiar with the language of the Sages finds plenty of contradictions in their statements. He observes, for example, that the stone is at one time said to be mineral, at another time vegetable or still at another time animal. So, in order to avoid heavy losses of time and property, one has to keep always in mind the Sages' words that "We are the inhabitants of a town which no one may enter without knowing our language". Here Jildakī quotes a quatrain from Ṣāhib, in which the latter asserts the same opinion and sounds a note of warning:

"You would solve the enigmas of our town,
And attain your hopes, if you were our brother;
Otherwise you shall not live in comfort in it, for it is a garden
Full of vipers for the explorers".

But the reader of Jildakī's book, The End of the Search, has no cause to worry; for, he says, he has not included in it any false or ambiguous proposition.

"And we say," Jildakī continues, "That the compound of the Sages of which the Elixir is born definitely contains the four principles: the solvent water, the unflammable oil, the active tincture and the stable body". To every one of these principles the Sages have given many different names. The following are some of the names given to 'the solvent water'; "The pure water, the salt water, the natron water, the alum water, the spring water, the sea water, the divine water, the sword water, the qilī water, the sharp water, the distilled vinegar, the head water,⁽¹⁾ the white mercury, the sea physician, the sal ammoniac water, the borax water, the lime water, the hair water, the eternal water, the western mercury, etc. With regard to the unflammable oil, the Sages have called it: the conciliator⁽²⁾, the distilled olive oil, the oil of sheep trotters, the curdled milk, the oil of artichoke,⁽³⁾ the milk of euphorbia, the oil of the tree of love, the pure oil, the white gum, the oil of hair, the oil of yolk, the oil of salammoniac, the oil of sulphur, the mastic sulphur,⁽⁴⁾ the oil of arsenic, the suet of goats' kidneys, and the like. As to the tincture, it is called: the fire, the stone which cleaves the head,⁽⁵⁾ the blossom, the carthamus tinctorius⁽⁶⁾

1. Potassium carbonate.

2. ماء الرأس

3. المؤلف

4. دهن الحرشفلا

5. الكبريت المصطكاوي

6. الحجر الذي يشبع الرأس

(the bastard safflower), the saffron, the spirit, the sulphur, the arsenic, the red copper, the saffron of iron ($\text{Fe}_2 \text{O}_3$), the verdigris, the manure, ⁽¹⁾ the fixed cinnabar, the reduced antimony, ⁽²⁾ the prepared tuty, ⁽³⁾ the yolk, the red-lead, ⁽⁴⁾ the vitriol, the Šahīra, ⁽⁵⁾ the tincture of gold, the coral, the celandine, and the like. As to the stable body (it is called): the animate body, the raw body, the litharge, the calx, the bone black, ⁽⁶⁾ the calcined silver, the calcined gold, the reduced calcined iron, ⁽⁷⁾ the white lead, the shadeless copper, ⁽⁸⁾ the white earth, the elephant's tusk, the heavy body, the man, the foliated gypsum, the pure sulphur, the coagulated mercury, the crouching lion, the sun, the moon, the son, the baby, the old man, the child, the young man (or, the young slave) the red sulphur, the pargeting arsenic, ⁽⁹⁾ the molten oil, the thirsty earth, the fetter, ⁽¹⁰⁾ the rock, the whetstone, and the like. If you consider the names to be too many, keep those four ⁽¹¹⁾ and leave

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1. السبرقون
 2. الروسخنح المستنزل
 3. التوتيا المدبرة
 4. حمرة الامرج
 5. الشحيرة : شخيره : Ashes of which soap is made.
 6. كلس المظام
 7. الحديد المكلس المستنزل
 8. النحاس الذى لا ظل له
 9. الزرنينج المورق
 10. القيد
 11. Water, oil, tincture and earth.

the rest" ⁽¹⁾ The four principles, namely, water, oil, tincture and earth are the constituents of all things in the three mineral, vegetable and animal kingdoms. It is therefore, to these principles that all the substances are reduced on decomposition. But it must be remembered that there is a great difference between "the boracic waters, the inflammable oils, the unstable ⁽²⁾ tinctures, and the crusty earths" on the one hand, and "the heavy, penetrating, thick waters, the pure unflammable oils, the wonderful, strong, effective tinctures, and the animate, eternal bodies" on the other. The former do not combine with one another and no benefit is derived from them, while the latter are capable of combination and yield the desired result, no matter from what material or by which method they have been produced.

Jildakī now turns to describe the properties and the relative importance of substances in the animal, vegetable and mineral kingdoms.

Beginning with the animal substances, he says that there is no 'life and stability' in them. Their waters are boracic, their oils inflammable, and their tinctures unstable. The most a Sage could do is to render the animal oils and tincture waxy, fusible and unflammable, by successive distillation, after which they become 'either white or red'. There are two benefits which may be reaped

1. Es., Vol. II., pp. 33-4

2. مستحيلة

from this. Firstly, it is possible to employ the animal oils and tinctures thus prepared in the production of pure and soft bodies capable of being used "in the projection of the Elixir and in the science of the Balance". Operations involved here are pounding, moistening, reduction⁽¹⁾ and ablution. Secondly, these oils and tinctures may be combined with pure mercury and sulphur and then united with a stable body, "producing an effective, tinctorial, and beneficial, external Elixir". But from animal 'bodies' it is not possible to produce any kind of elixir. Certain parts of animals are used in "ablution, purification, softening and fusion". The Elixir produced by the combination of animal and mineral substances is not solely 'external', it is also to some extent 'internal'.⁽²⁾ This Elixir is very much like the 'real Elixir', and if it is carefully produced it will resist the refining fire. "The calx of the egg's shell, the water of egg, the oil of yolk" are among the animal substances used in the Art. If the eggshell is treated with 'the white water', it will soften and

1. تشوية

2. Jildakī does not make it clear what he means by the terms 'external' and 'internal'. Probably by 'external' Elixir' he meant the one which tinctures only the surface of the metals.

finally dissolve the latter, making it acrid. Some of the animal parts which are employed by the Sages are: "hair (its sal ammoniac, its oil, and its tincture), gall-vesicle, skull, hoof, urine, human excrement, horn, brain, liver, spleen, semen, bone, skin and the like," all of which include "water, oil, tincture and sediment". Jildakī once again emphatically asserts that 'the real stone' is not to be found among the animal substances because these bear only a remote relation to the stone, and moreover they do not include any 'stable body' in which the spirits could settle.

Jildakī then goes on to describe the use of plant products in the Art. Some of the vegetable substances, he says, react on minerals and are used to asst^{is} "purification, decomposition, (1) coagulation of the volatile, whitening, and reddening. From vegetable substances it is possible to derive sharp, boracic waters, excellent oils and also tinctures, but instead of earths they have ashes which become useless after the extraction of their salts". The salts derived from vegetable ashes are used for purification, and when they are treated with vegetable waters their sharpness and their purifying property intensify and they become capable of rendering the vegetable oils fire-resisting. Certain animal extracts, when combined with appropriate mineral substances, are used in the

1. Dissolution is considered by Jildakī to be a kind of decomposition.

science of the Balance and help to cure the diseased metals. "No one doubts that the water of the tree of love coagulates the volatile, and the same is true of mezereon and the milks of euphorbias. And all the unflammable oils, such as the distilled and stable olive oil, the distilled and stable sesame oil, even the oil of walnut, almond, hazel-nut, pistachio, terebinth, safflower seed, linseed, in short all vegetable oils, when rendered unflammable by being mixed with boracic, calcined salts and by successive distillation until they become pure white or pure red with no streak of blackness, assist the fusion, purification, removal of accidental qualities and refining of the essence of everything made up of sulphur and mercury; they also assist the coagulation of the volatile, be it malleable or brittle; they assist too the purification, moistening, softening, fusion, and tincturing of imperfect bodies". "There is no denying", Jildakī goes on, "the action of qilī salt on sulphurs and oils, or the action of the pulp of pomegranate on iron, or that of the juice of leek and salt of myrtle on the two leads, or that of the water of garlic on asbādariya".⁽¹⁾ But in spite of all this the stone of the philosophers is not to be found among the vegetable substances.

Jildakī now turns to the mineral kingdom. Minerals, he says, include everything on earth except animals and plants. He arranges minerals in different groups, describing each in turn, without, however, numbering them or mentioning their total number. The following are

1. اسبازرية : asbestos, or asafetida?

the various classes of minerals in order of precedence as described by Jildaki:

1., Rocky stones, such as rocks, flint, tufa (or pumice)⁽¹⁾ and the like. These are not used in the Art, but they have their uses in building and construction.

2., Dusts and clays. Some of these are used in the construction of furnaces, bellows,⁽²⁾ ovens, and crucibles. For further information in this connection, Jildakī recommends the reading of one of Jābir's books called K. al-'Atyān (The Book of Clays).

3., Sands, which are used in glass making.

4., Gypsum and talc. "They include mercuric souls and adhesive moisture". If gypsum and talc, as well as glass, are calcined, kneaded, moistened, and finally dissolved, they would assist the 'coagulation of the volatile'.

5., Salts. They are of different kinds: "oil^y, not-oily, pungent, bitter, and those which lie in between". Some of these after being dissolved, coagulated, calcined and refined, become capable of coagulating the volatile, and purifying the sulphurs, arsenics and imperfect bodies. And if the dissolution of these salts is completely achieved, they would also become capable of assisting the dissolution, fusion, purification and combination of the substances mentioned

1. كدّان or كدّان

2. منافع

above (i.e., sulphurs, arsenics and imperfect bodies). The salts exhibiting these properties are: sal ammoniac, tinkar, camphor, naphtha, nitre, boraces, alum, qild̄ and the like. They are first added to the substances under treatment and then removed at a later stage, leaving no residue behind. For the smallest amount left behind would stick to the souls and prevent them from combination.

6., Pearls, transparent mineral stones and the like. They are of no importance in the Art, that is, nothing is produced from them. For their decomposition always ends in corruption. Nevertheless, if a pearl undergoes a 'natural dissolution', it will often coagulate the volatile substances; "for it was originated itself by the coagulation of water inside the animal".

7., Jasper⁽¹⁾ and turquoise. They possess a tinctorial power similar to that of the verdigris, and are therefore capable of assisting purification and tincturing of other substances, particularly copper and silver. But before they are used they must be dissolved and also cerated; for, in contrast with other hard, transparent stones, they are easily soluble.

8., Carnelian, coral, sea-shell, snail-shell and the like. They are used in calcination, softening and purification.

1. رهنج

9., Unmalleable, crumbly bodies, such as tutia, marcasite and magnesia. "They may not be decomposed except by the addition of something dissimilar to them". And after they have been decomposed and purified, they are used in the preparation of stable tinctures. Jābir, according to Jildakī, has described in his books the method of handling these bodies. Excessive heat and dryness have a corruptive effect on them. Now, if their sulphurs are first extracted and then, after the cleansing of the remaining parts, added again in a certain measure so as to establish an equilibrium of natures, these crumbly bodies become capable of combination with metallic bodies, turning the red ones white and the white ones red. Crumbly bodies are of great benefit in the Art, for they are closely related to metals. In fact metals and crumbly bodies are originated from common materials, so that the difference between them is due only to the affliction of the latter groups with accidental qualities. Therefore, when the accidental qualities of the crumbly bodies are removed, the difference between them and metals disappears and they combine permanently with the latter, with no possibility of separation.

10., Malleable, fusible bodies. These are the principal substances with which the Art is concerned, "and we will mention here", says Jildakī, "the special properties of each one of them"

- a) Gold It is the king of metals, just as sun is the king of stars. But, like other metals, it is liable to corruptive calcination, and for this reason its colour may not be

considered as perfect. If a certain amount of heat and moisture is added to it, it will transform into the Elixir, whereas the addition of litharge, lead, black lead, minium, or some impure substances, has a corruptive effect on it. When melted upon a plate (ceration) it becomes like molten wax, and may be formed into any desired shape. Proper melting endows the gold with the qualities of a perfect principle. And when it is moistened with "the divine water, or the saliva of vipers, or the water of the two gums, or the substance formed by the combination of the soul with the unflammable oil, or the substance formed by the combination of the two healthy sulphurs, it will transform on refining, into a perfect Elixir", and its colour will turn from yellow to purple; this is the proper calcination of gold. Jildakī warns the reader against mixing gold with impure substances and also against its improper calcination.

- b) Silver. The Sages, says Jildakī, have described the proper way of calcining silver, so that it would not be mixed with 'unlike' and impure substances. Melting of silver upon a plate (ceration) transforms it into a 'perfect principle', ready to be mixed with the spirit and the soul, forming a dough from which the Elixir of Whiteness is produced.

'The water of the two gums', and also the compound produced by the combination of mercury and arsenic, may be used in the calcination of silver. The metal is many times treated with either of the two solutions just mentioned, or with any other having the same properties, until it attains equilibrium.

c) Copper. It is an impure body from which no benefit may be derived unless it is calcined and its impurities and sulphurs are removed. In the course of this cleansing operation it changes its colour, becoming yellow, then white and finally red. If the red copper, like gold, is first cerated upon a plate, melting with a small quantity of heat, and then moistened with 'the soul-spirit compound', it will transform into the Elixir of Redness. The white copper, on the other hand, if it is first cerated and then moistened with 'the soul of the two gums', will transform into the Elixir of Whiteness. Purified copper is actually considered as one of the four principles: the white one combines with the moon (silver) and the red one with the sun (gold), forming permanent and homogeneous compounds.

d) Iron. Its 'action' is similar to that of copper, and its decomposition ⁽¹⁾ is generative and not corruptive. On

removing its impurities and sulphurs, it becomes either white or red, according to our desire. It is then cerated upon a plate in the usual manner, whereupon it rises to the rank of a 'perfect principle of the Elixir'. The cerated white iron, after being treated with three times its weight of 'the soul of the two gums, and the yeast', becomes capable of transforming imperfect metals, such as pure tin, into pure silver, and of forming a permanent and everlasting union with the latter. The red iron, on the other hand, after being cerated and calcined in the same manner as the white one, tinctures the silver and transforms it into gold 'on suspension'⁽¹⁾

But if iron, when purified, acquires the colour of saffron, an excellent Elixir of Redness may be produced from it. This will impart to silver the perfect and stable colour of gold, and will combine with the latter, forming a permanent union.

e) Tin. When all its impurities and sulphurs have been removed, it unites with silver, forming a perfect compound. And if purified, cerated, calcined, white iron (i.e. the Elixir of Whiteness produced from iron) is projected upon it, it will transform into pure silver, and will combine with the latter, never to be separated from it. Purified tin after being

1. علي التعليق: Apparently a form of heating.

cerated upon a plate and calcined with 'the soul of the two gums, and the yeast', may be used, like iron, for the production of the two Elixirs.

- f) Lead. Like copper, iron and tin it needs to be purified, and as a result of purification it will become either white or red. By the action of the 'water of the two gums, together with sal ammoniac', the white one transforms into the Elixir of Whiteness and the red one into the Elixir of Redness.

The volatilization of the malleable bodies is beneficial only in two respects. In the first place, it purifies them, and in the second, it facilitates their combination with the soul. And of course soul and body do not combine with each other unless they are helped by pure spirit which plays the part of an intermediary. After their ascension to the top of the vessel, soul and body descend to the bottom and combine with each other, forming a homogeneous and easily fusible substance. If a white metallic body (i.e. a metallic body which has been made white by purification) is used, the resulting substance will be the Elixir of Whiteness. And if a red metallic body (i.e. a metallic body which has been made red by purification) is used, the resulting substance will be the Elixir of Redness.

Now a metallic body, continues, Jildakī, which has got rid of all its impurities and has undergone a generative decomposition, is of the same rank as the new body at the beginning of combination.

And know that the water of the two gums, used in the External and Internal operations, is the divine water to whose rank nothing may be elevated except combined mercury and sulphur after complete purification". The gold of the philosophers is different, says Jildakī, from ordinary gold; and the same is true of other metallic bodies. In this connection, he gives a quotation from Kutub al-Mawāzīn of Jābir: "The bodies of the philosophers are not ordinary bodies, for ordinary bodies are different from the bodies of the philosophers".

Jildakī then goes on to tell us something about mercury, sulphurs and arsenics. From mercury alone, he says, no elixir may be produced, no matter whether it is the mercury of the philosophers or the ordinary one. The latter is impure, and the only way to purify it completely is by volatilization, which has the same effect on mercury as proper calcination had on metallic bodies. Again, it must be remembered that the volatilization of the philosophers is different from the ordinary one. After mercury has thus been purified, it rises to the rank of a principle, but "requires an adhesive moisture to unite with and a body in which to settle". In this way mercury is transformed into the Elixir of Whiteness, if it is white, and to the Elixir of Redness, if it is red.

As to the sulphurs and the arsenics, because of their excessive dryness, they are combustible. Nevertheless, since they are related to the metallic minerals, if they are made fire-resisting by the

isolation of their healthy component and the removal of the rest, they would rise to the rank of pure principles, capable of being perfectly combined with pure mercury. Here again, Jildakī is quick to point out that the sulphurs and arsenics of the philosophers are different from the ordinary ones. Failure in the Art results from misunderstanding the real intentions of the Sages: "Do not be suspicious of the operation of the Sages and their stone!" Jildakī then quotes the following passage from K. al-Aḥjār (The Book of Stones) of 'Aristotle' ! "Sulphur", says the latter, "is used to redden the white and to calcine the gold on melting with it. And after gold has been calcined, if a little of the boracic stone is projected upon it, it becomes gold again. All bodies and stones, when they encounter fire, burn until nothing remains of them" It is only the pure sulphur, comments Jildakī, which exhibits these properties. He quotes here a poem of Ṣāhib, in which the latter describes how ignorant fools are misled by their superficial interpretation of the Sages' words, To illustrate this point, Jildakī gives a very interesting example, showing how the Sulphur-mercury theory of metals is misunderstood by 'stupid people'.

According to the Sages, says Jildakī, metallic minerals originate from sulphur and mercury. Not understanding the real intention of the Sages, who on purpose, Jildakī goes on, did not wish to be explicit, the stupid people start mixing sulphur with

mercury in the hope of producing metallic bodies, and, of course, they fail in all their attempts. Metallic minerals originate from sulphur and mercury when these are still in the state of formation and have not yet coagulated completely. In other words they originate from sulphur and mercury 'before sulphur becomes sulphur' and 'mercury becomes mercury'. "Moreover, sulphur originates in an earth different from that in which mercury is produced. Fusible bodies do not, in fact, originate from these coagulated sulphurs, nor from that quivering mercury. Mineral bodies originate only from the steam and the smoke, from uncoagulated mercury and uncoagulated sulphur, or, to tell the truth, fusible, mineral bodies originate from nothing but the water and the oil. In the blind (hollows of the earth) the gentle (natural) heat causes the water to ascend to the top, carrying the oil with it. There, because of proximity to coldness, it cools down and descends, alighting on the part remaining at the bottom. So the natural heat matures it, and it constantly moves up and down, part of it tumbling over the other. Then it gradually becomes more and more gummous, thick and hard, until it appears as a molten, malleable body". At first, continues, Jildakī, only a small part of the oily water coagulates, and this then acts as a leaven which gradually grows by feeding upon the remaining part. "The molten malleable body" hardens

little by little, developing into an actual mineral body, which would be gold if the earth from which steam and smoke emanated has been pure and if there has been a 'moderate heat'. With pure earth and deficient heat, silver is produced.

We remember that in the first volume of his work,⁽¹⁾ Jildakī supported the opinion of the Sheikh that lead is found in silver ore, and silver in gold ore. But here he withdraws his approval, saying that he had not then opposed the Sheikh, whose view is shared by other Sages, because he believed that initiation in the Art must be gradual. Lead, he argues, is produced from impure earth, and for this reason its occurrence in silver ore is impossible, "considering that it lacks the power of rejection". The so-called lead found in silver ore is nothing but silver which is not yet completely matured and, therefore, melts like lead with a lesser amount of heat. And, if the Sages had examined the so-called lead more carefully, they would have found it to be free from impurities. There might be a little 'blackness' in it, but then silver is not completely free from blackness; for, after all, the sulphur and the mercury which go to make up silver have small streaks of blackness in them. Now the same thing may be said of the so-called silver found in gold ore. Jildakī then somewhat apologetically states that his criticism

1. See p.p. 7, 8, 10 above.

of the Sheikh in particular and of the Sages in general does not in the least injure their high reputation. He adds that the Sages are not annoyed when their mistakes are pointed out to them. Subsequently he gives another quotation from K. al-Ahjar (The Book of Stones) of 'Aristotle':

"As to the Arsenic", says pseudo-Aristotle, "it is of different kinds: the red one called sandarac, ⁽¹⁾ the yellow one, the arsenic, and the dust-coloured one. Anyone who calcines one of the two kinds, i.e., the yellow and the red, until it becomes white, and then projects it, together with some borax, upon the red copper, will make the latter white and nice to look at, getting rid of its stinking odour" ⁽²⁾

It is to explain this passage that Jildakī enters upon a long and rather important discussion concerning the constitution and the properties of arsenics, as well as sulphurs and mercury. Leaving out the numerous repetitions, the account which follows includes all he had here to say on the subject:

Stupid people believe that calcination of arsenic is the same as their own volatilization, which a careful examination would show that this is not true. Interpretation of the words of the Sages by ignorant fools is always erroneous. As a matter of fact, "Jābir has said in many of his books that volatile substances are all corrupt", and that

1. Red arsenic, sulphide = realgar.

2. Es., Vol. II p. 54: **وأما الزرنيخ فهو أنواع الأحمر المسمن السبدرج والأصفر والزرنيخ والأغبرو**

من كل واحد النوعين من الأصفر والأحمر حتى يبيض وألقى معه شيء من البورق على النحاس الأحمر ليضه وحمته وحسن منظره وذهب برائحته المنتنة .

only some of them are tinctorial, and even then their tinctures are not permanent. "We explain for you the cause of this corruption (i.e., combustibility), and say, that sulphurs and arsenics are combustible and combustive, because they contain an excessive amount of inflammable oil". Minerals are formed in the mines by the combination of 'moisture' and 'dryness', or more precisely, 'watery moistness' and 'adhesive oiliness'. It is the excess of the latter component which results in the formation of sulphurs and arsenics. So in both sulphur and arsenic, oiliness is in excess of earthiness; "but oiliness of sulphur is more than that of arsenic, while its earthiness is less". Each of these, i.e., sulphur and arsenic, contains a sound and healthy component, which may be oil, or tincture, or earth. And anyone who succeeds in decomposing sulphur and arsenic in such a way as to isolate their 'sound components' will understand 'their secret'. Sulphur and arsenic have, of course, their uses in the Art, but there is a limit to their powers. It is said, for example, that "sulphur reddens the white", but this does not imply that it is capable of, say, transforming silver into gold. Not everything that has a reddening effect necessarily exerts the same influence as the Elixir of Redness. So it is with arsenic: its whitening effect is not the same as that of the Elixir of Whiteness. And, in fact, 'Aristotle' did not say that "arsenic when whitened by special calcination"⁽¹⁾ transforms copper into silver. He said

1. The Greek alchemist, Olympiodorus (5th Century A.D.) obtained white arsenic, As_2O_3 , by roasting arsenic sulphide. See P.E.M. Berthelot, Collection des Alchimistes grecs, Paris 1887-88, pp. 69-105 (Text grec).

that it whitens the copper and gets rid of 'its stinking odour'. What he actually meant was that white arsenic removes part of the impurities contained in copper, and by so doing brings it nearer to silver. Complete transformation of copper into silver, however, requires the use of "soul to nurse it, and spirit to tincture it, and salt to complete its purification". And it was for this reason that 'Aristotle', in order to obtain a better result, recommended the use of some borax in addition to white arsenic. "And know that both sulphur and arsenic contain oil, tincture, earth, and a little water". And since heat is predominant in their constitution, they have a fiery colour, and when brought near fire they start burning. But if they are handled gently in the manner of the philosophers, their fiery component may be extracted and softened until it turns into a 'watery, inflammable oil'. So there is an essence in both sulphur and arsenic which may be extracted and made fusible, malleable, ductile, fire-resisting, and capable, like coagulated mercury, of combination with metallic minerals. "There is no doubt that both sulphur and arsenic originate, like mercury, from steam and smoke". It was mentioned before that mercury, after being purified, fixed, and coagulated, may be transformed into silver or gold, according as it was made white or red in the course of purification and coagulation. Now silver obtained from mercury is actually heavier and more powerful than ordinary silver; for, contrary to the latter, it is capable of transforming purified, imperfect metals into silver. And mercury

when transformed into gold becomes capable of uniting permanently with the latter, and it often imparts to silver a yellow colour which is not exactly the colour of gold. But silver tinctured in this manner becomes perfect gold when combined with it. " A good example is pure, stable cinnabar which tinctures silver and combines with gold". Now sulphur and arsenic also, when their 'light, ashy part' is removed and they are made fusible, pure and heavy, become capable of transforming copper into silver, or silver into gold, according as they were made white or red". "And this is what the philosophers imply by the word 'tanqīr' (transforming into silver)". The mercury which forms one of the two component parts of metallic minerals is usually referred to by the Sages as 'the soul'; the other component, sulphur, is called 'the spirit'. Ordinary mercury and sulphur, as well as arsenic, contain 'soul' and 'spirit' in addition to 'body'. The difference between ordinary mercury and 'the soul' is that in the former 'watery moisture' predominates and from that it takes its name. For it is a common practice among the Sages to give to a substance the name of its predominant component. For example, substances in which 'the oily moisture' is predominant are referred to as arsenics, or sulphurs if it is still more preponderant. "And if you pay more attention you will find that all minerals are from one thing, and that the differences in their properties are only due to their being afflicted by accidental qualities". The

central theme of the Art is the removal of these accidental qualities, and this would not be possible unless the constitution and the properties of all substances, as well as the means and methods of operation, were fully understood. For example, to extract the healthy component of sulphur, or arsenic, it must be first moistened with pure water and then pounded well. If it is not moistened before pounding, and 'dryness' is added to it instead, it will ignite on pounding and corruption ensues. After moistening and pounding it is left to dry, and subsequently it is dissolved in an appropriate acrid and solvent moisture. In this way its soul, its spirit and the soft part of its body will dissolve. The coarse part of its body precipitates at the bottom of the vessel and is rejected. Then by heating the solution with a gentle or strong fire, the healthy component of sulphur, or arsenic, is obtained. "And know that sharp waters, because of their quickness in action, have numerous uses in the Art and produce astonishing results. And if the able man were able to prepare a solvent, sharp water which dissolved and disintegrated the souls, the spirits, the bodies and the filings thrown into it, he would be capable of extracting their healthy part and removing their corruptive, accidental qualities in no time. Now that we have reached this stage of our instructions, we pass on to support our words with quotations from the first book of The 112 Books of the great master Jābir, may God have mercy upon him! " There follows a chain of

quotations from Jābir, from each of which an account is given below in order of precedence. Repetitions are omitted and translations are given of the more important passages.

Jābir: "The subjects of this perfect science are three: the first is the science of ^{the} Balance, the second is theory together with practice and skill - these two subjects are of great importance - and the third is Interior-Exterior, i.e., experiences and comparison"⁽¹⁾

As to the science of the Balance, it deals with the natures, with the quantitative relations, and with similarities and diversities of different things. The four maternal qualities ⁽²⁾ or natures are hotness, coldness, moistness, and dryness. From these natures originate, by 'motion and rest', the four elements, i.e., fire, air, water and earth. In the animal kingdom, besides the four natures, there are four humours: yellow bile, blood, black bile, and phlegm. The motions of sun and stars, the sequence of the four seasons, as well as the properties of things, have to be studied by the Sages. They must know, for example, whether a substance is coarse, soft, ugly, beautiful, sweet, sour, salty, insipid, greasy, fusible and malleable, fusible and crumbly, infusible and crumbly; how many spirits, souls, bodies and waters it contains; what the properties of each of these are, and what effects they produce when they combine together.

1. Es., Vol. II. p. 61: ان مطالب هذا العلم التام ثلاثة الاول علم الميزان الثاني العلم والعمل والصناعة و هذان المطلبان شريفان والثالث داخل خارج وهو التجارب والقياس

2. امهات

Jābir: Hotness is the opposite of coldness, moistness is the opposite of dryness. "Hotness and coldness are active in form, moisture and dryness are passive in matter, i.e., hotness and coldness break up the things into their essences while they themselves undergo no change; moistness and dryness, on the other hand, transform into things themselves and do not cause transformation of other things unless they are greatly predominant".⁽¹⁾ Excessive predominance of moisture and dryness, in fact, gives rise to far-reaching results in all the three kingdoms.

Jābir: "Souls and spirits fall into the same category, and bodies into another. But as to the water, its position is doubtful: some people say it falls into the category of soul-and-spirit, because it is affected by fire, volatilizes and undergoes transformation; others say it must be counted among bodies, because of its solidification, permanence, slowness of motion, and conversion into earth and stone; still others say that water is the root of fusible and infusible stones, as well as of souls and spirits. The last opinion is true: water is the root of the roots,⁽²⁾ and its compounds are not equal to it"

Jābir: "There is no way of understanding this science (lit: world) except by knowing the action of the stones over one another,

1. Es., Vol. II., pp. 62-3: فان الحرارة والبرودة فاعلان بالصورة واليبوسة والرطوبة
منفعلان بالمادة وذلك ان الحرارة والبرودة تحيل الاشياء الى ذواتها ولا تستحيل الى شئ منها
وان الرطوبة واليبوسة تستحيل الى الاشياء ولا تحيل الا بالقبلة العظيمة .
2. Thales (640-546 B.C.) regarded water as the cause of all things.

the extent of their effects, the receptibility of the recipients among them, and the refusal of the refusers; these are the minimum requirements".

Jābir: "External-internal things ⁽¹⁾ originate from sulphur and arsenic, and from sal ammoniac and mercury, silver, gold, black lead, white lead, glass, salt, depilatory paste, and green vitriol. These are, at the beginning of the operation, External, but later become Internal".

Jābir: "The Internal-external things originate from iron, copper, talc, lead, black-lead, salt, depilatory paste, calx of bone, mercury, green vitriol, copperas, and all vitriols. These originate as Internal and then transform and become External".

Jābir: "Things which are only External, originate from sulphur alone, or from arsenic alone, each one separately, or from sal ammoniac alone, or from silver together with other things which have a weakening effect, and from gold together with other things which have a weakening effect".

Jābir: "Among the things which are only External, there are those which are lifeless, like mineral bodies, and there are those which

الإشياء البرانية الجوانية. 1. Cf. Kraus, Jābir ibn Ḥayyān, Vol. II.,

Cairo, 1942, p. 228.

are animate, like souls and spirits; and there are those which are stable, i.e. they do not burn with fire; and there are those which are unstable, i.e. they burn with fire.

"Souls and spirits are six only. If they are said to be Internal, it means that they are generally from the animal and exceptionally from the vegetable kingdom; for animal substances are more succulent and active. As to the stony substances, they are generally External, but the soul is External at the beginning of the operation, becoming Internal later on".

Jābir: "According to the Sages, the soul, when Internal, is water, and, when External, is mercury. As to the spirit, it is oil, when Internal, and it is arsenic and sulphur, when External. As to the augmentative things ⁽¹⁾, they are among the Internal, as well as External (substances); those among them which act like soul are two: sal ammoniac and camphor. And it is possible to define everyone of these in such a way as to make it distinct from others. Three of these are souls; they are combustible and, when they clothe other things, they make them combustible too; these are:- arsenic, sulphur and oils. And three others are spirits; they are not combustible, neither they make other things combustible when applied to them; these are:- mercury, sal ammoniac, and camphor. And these (six) are all (the souls and spirits)

that exist in the world. Three of these souls-and-spirits are very useful in operation, they are the roots of the Elixir. Nevertheless, they are Internal: oil alone, and External: mercury, sulphur and arsenic. They are only three and not four in number, for arsenic and sulphur are, in fact, one? (1)

Jābir: Things may be similar or dissimilar to one another. They may be similar in one respect and divergent in another. Constitution, i.e., the relative amount of natures present in a substance, usually forms the basis of comparison, and that is why the Sages consider the different individuals of a single species to be similar. But, of course, shape or any other quality may form the basis of comparison. "Gold, Silver, and copper are similar in essence and in accidental qualities which afflict them. Gold excels silver only in yellowness and heaviness; and silver excels copper only in whiteness and heaviness. And so it is with the rest of the fusible bodies. But the principles in this Art are those which, so far as the Sages are concerned, are irreplaceable, they are: arsenic, sulphur, mercury, and sal ammoniac only." Mercury is the root and the raw material of fusible bodies. The latter originate from mercury, just as animals originate from sperm, or plants from seeds, or stones from the water. "As to arsenic and sulphur, they play the part of an intermediary between bodies and souls, prevently the latter from volatilization..."

1. Cf. the three principles of the Latin Geber: Hg. S. and $As_2 S_3$
(E.J.Holmyard, The Works of Geber, London, 1928, p.58)

As to the aetites,⁽¹⁾ it is the cleansing stone."

Jābir: It is said that the Elixir originates 'from one thing', and it is also said that 'it does not originate from one thing alone'. It is like saying that 'Zayd is seated' and then adding that 'Zayd is not seated'. Now, the apparent contradiction would disappear in the given example if it is pointed out that Zayd who 'is seated' is not the same person as Zayd who 'is not seated'. When it is said that the Elixir 'is from one thing', by 'one thing' is meant 'the principle' which, after being divided into parts and having passed through different states, 'becomes one thing again in the end'. And when it is said that the Elixir 'is not from one thing alone', it is meant that the raw material of the Elixir does not possess all the qualities required, and that the aim of the operation is to bestow upon it the qualities it lacks. The two statements are thus reconciled and the contradiction is removed. But it must be mentioned here that the possibility of the existence of a natural Elixir, as distinct from that produced by operation, cannot be ruled out. After all, Nature has been capable of producing a perfect animal like man, a perfect plant like a palm-tree, a perfect stone like gold, and many other perfect entities. "In fact, our method of operation is not as perfect as that of Nature. We only try to imitate the processes of Nature; for Nature is the greatest physician and the

1. المناب : Most probably by 'aetites' Jabir meant sal ammoniac.

most able artisan" (1)

Jābir: Two things may be similar in certain respects and different in others. They may also be similar, or different, in all respects. In the latter case, they are said to be opposites. Now when it is said that the Elixir is "from two things, or similar things, or different things", it must be noted ^{that} by 'different things' is not implied 'opposite things', i.e., things which are different in all respects. By 'different things' is implied things different only in certain respects and similar in others, like silver and gold, honey and sugar, man and ass, palm-tree and olive-tree, etc. The combination of completely different things, i.e., opposites, often results in corruption.

Jābir: Objects of comparison may be individuals of a single species, or they may belong to different species. If we take, for example, uprightness of stature as the basis of comparison, a class is formed which includes all human individuals. On the other hand, if we take blackness as the basis of comparison, a class is formed which includes many diverse things, such as pitch, ebony, 'black heart' negroes, black eyes, crow etc. Now, so far as the Art is concerned, our comparisons are mainly confined to the individuals of a single species. This implies that the things compared, besides the point of resemblance which forms the basis of comparison, have other properties

1. Cf. E.J. Holmyard, The Works of Geber, London, 1928, p.36

in common. For example, when two things are said to be 'hot', it is evident that there are other points of resemblance between them, such as similarity of action; for it is impossible to imagine two 'hot' things behaving in different ways. The same thing may be said of things possessing one of the three other qualities, namely, coldness, moistness and dryness.

Jābir: "Things between which there is affinity will combine together" Bodies do not combine with souls if there is no affinity between them. The cause of affinity is the moisture contained in substances. Yet two things do not combine unless they possess the same kind of moisture. Things which contain no moisture whatsoever do not enter into combination at all. When bodies combine with souls, their tinctorial power is increased. Alum, salt, talc, egg-shell, combustibile substances, ashes, dusts, and the like, do not coagulate the souls unless they are purified and moistened. The raw material used for the production of a substance must have a constitution similar to it; otherwise the operations involved will be complicated and often produce no result. "Things which are used for reconciliation and unification of bodies and souls" ⁽¹⁾ must, like the substances they help to combine, undergo a series of operations designed to improve their qualities and make them capable of performing the functions with

1. Es., Vol. II. p 75:

الاشياء التي يكون بها تأليف واجتماع الارواح والاجسام .

which they are charged. The 'nearer' the constitution of two substances to one another, the greater their affinity for combination with each other. And that is why substances which readily combine with one another are said to be one. "The seven fusible bodies originate from sulphur and mercury"; and to the extent that they contain mercury in their constitution, they are similar to it and combine with it, and so it is with sulphur. Similarly, sulphur resembles oil, water, earth, and fire to the extent that it contains each of these in its constitution. Therefore, substances which resemble one another in every respect are one and the same thing. (1)

Thus comes to an end the chain of quotations from Jābir, included in Jildakī's explanation of the last quoted excerpt from Al-Muktasab.

Jildakī praises Jābir and agrees with his views. Referring, for example, to the statement of Jābir that the raw material used for the production of a substance must have a constitution similar to it, he says "it is sheer stupidity", when there are two ways of achieving the same end, to choose the one which is longer and more arduous. To make the point clear, he cites an example. Suppose, he says, a person wanted to get rid of his excessive black bile. The proper way of doing so is to take black myrobalan or epithem or similar things. Now instead of using these, it would be foolish, he argues

1. Cf. E.J.Holmyard, The Works of Geber, London, 1928, pp. 56-8.

to choose scammony, which is normally used against the excess of yellow bile, and, in order to make it capable of curing the excess of black bile to try to bestow upon it, by operation, the quality that it does not intrinsically possess.

Once again here Jildakī underlines the importance of his present book. "Be thankful to God", he says, "who has let you possess this book which has no parallel among the rarities of the world, except for some of our lengthy works, such as Ġāyat al-Surūr Ṣams al-Munīr, and Ṣarḥ K. al-Rāha (Commentary on the Book of Repose)."

Jildakī then passes on to tell us about the views of the amalgamists and the effectiveness of their methods. "Those", he says, "who favour amalgams are more likely to achieve success, so far as the External things are concerned, than those who favour External principles. Mercury, in fact, when amalgamated with gold and continually washed until it gets rid of its blackness, and moistened with pure oil of sulphur until it coagulates, reddens like cinnabar, and becomes stable, will combine with gold (to form a permanent and homogeneous compound which is not different from gold) and will tincture silver. Similarly, when it is amalgamated with silver and moistened with the oil of arsenic, it will combine with silver and will tincture copper. But from other bodies when amalgamated, no benefit is derived, unless they are first cleansed and purified completely. As to the External principles it is not right to combine them before they are completely and perfectly dissolved.

If they are then coagulated in due measure, they will produce a result, white or red, according to their strength. Nevertheless, the body upon which they are projected must be approximated⁽¹⁾ to the desired thing beforehand - by purification,⁽²⁾ if it were copper and by exaltation,⁽³⁾ if it were gold. Everything save what we have mentioned and what is different from what we have described is false and contains no element of truth. Furthermore, this is perhaps the most difficult of the right methods, and that is why the Sages pay no attention except to their desired stone, their established measures and their balanced combinations. And so the ignorant fools turn away from them and engage themselves in performing impossibilities."

Sheikh: "And Ares spoke to Theodorus the King a parable concerning the description, and said, Agathodemon the Great had seven children. Two of them were girls, namely, Phoebe and Dhatu'l-Qarnain. The chief of these seven was Hermes, for he originated the operation and was the first to employ the materials. He gathered together his brothers and sisters unto him, and said: Verily I have looked into my affair and your affairs, O assembly of my brethren, and I saw no one with a better claim to the lordship than thee, O Sun. So I have entrusted the kingdom to thee. Rule thy kingdom well, therefore, that the subjects may be prosperous for thee and that thy goodness may be made manifest unto them"(4)

"Agathodemon the Great", explains Jildakī, "is Adam in relation to mankind, the celestial sphere in relation to the elements, Nature in relation to beings, and primordial matter in relation to minerals.

1. تقريب

2. تنقية

3. تعلية

4. Tr. pp. 35-6; Es., Vol. II. p. 81.

The four children are the four natures and the four elements. The two girls are the two passive natures, and the one called Dhatu'l-Qarnain (the essence of the two horns) is the moisture, for it is a medium between the hotness and the coldness. As to the seven, they are the seven planets and the substantive minerals which are related to them, and which form the materials of this Art".

Hermes is regarded, Jildakī goes on, as the chief of the seven children, because he was the first teacher of philosophy. Moreover, the planet Mercury, the chief of planets, is often called Hermes; and mercury is the mineral from which the fusible bodies originate.

The Sun, to whom Hermes, i.e., mercury, entrusts his kingdom is gold.

Sheikh: "And know, O Sun, ⁽¹⁾ that I am the most just of thy brothers to thee and the most affectionate of them, although I know that thy fieriness, O Sun, will destroy me and cause my beauty and splendour to vanish. The Sun said: Thou hast spoken truly, O Hermes; thy justice towards me and thy love for me are only on account of thy delight in killing me, but thou shalt not obtain the mastery over me, although thou wilt destroy my splendour and extinguish my beauty and my light. Hermes said: Verily, if I do that, O Sun, Allah (may He be exalted!) will make manifest in thy offspring such brilliance and abundance that thereby he will increase thee in honour among thy subjects and make their love for thee greater" (2)

Brotherhood, explains Jildakī, implies relationship and affinity.

Hermes is the feminine, cold and moist substance, which has a soft,

1. The dispute between Hermes and Sun continues almost to the end of the present section of Al-Muktasab.

2. Tr. p. 36; Es. Vol. II., p. 83.

flexible and beneficent nature. The Sun is the masculine, hot and dry substance, which has a hard, inflexible and unfeeling nature. Neither of these, i.e., Hermes and the Sun, would attempt to destroy the other completely; for complete destruction of one results in total annihilation of the other. Instead they marry each other and both of them undergo a generative, partial decomposition; they bring forth a child in whom rests the prosperity of the world - it is called the Elixir.

Sheikh: "The Sun said: O Hermes, verily thy brethren are all obedient to me and submissive to me except Ares, and he is averse to me, and yet he is a good brother to thee.

"He said: His Aversion is only on account of the badness of the mine (in which he originated) and his abundant earthiness. I will command him that he shall drive out from him that to which thou art averse in him, so that his metallic nature may become correct for thee. And I will rule his behaviour until he obeys thee and agrees with his brethren.

"He said: And how wilt thou do that, O Hermes?

"He said: My coldness when mixed with his fieriness will subdue his impetuosity and will mix with his earthiness, which will be made good. Thus Ares will be rectified, and as for the rest of my brethren, they are all obedient to me and submissive to thee? (1)

Some of the Sages, explains Jildakī, have said that Ares is fire, and some others have considered it to be Mars, and still others Jupiter. But it is sufficient to know that Ares is a hot, dry, fiery substance "included among the mineral brothers". And as it

1. Tr. p. 36., Es. Vol. II. p. 85.

has the same nature as the Sun, their combination would result in extreme dryness and finally corruption. Therefore, Ares, before being combined with the Sun, must be treated with Hermes, which is soft, cold and moist. This, indeed, will make it pure, lenient and obedient. Here, in support of his explanation, Jildakī quotes a poem from Ṣāhib.

Sheikh: "The Sun said: Dost thou not understand, O Hermes, that if thou departest from them for the twinkling of an eye they will quarrel, and knowest thou not that thou wouldst then be corrupting my kingdom for me and causing a breach between me and my brethren? And I swear to thee, O Hermes, that if thou art absent from me for the twinkling of an eye I will surely kill thee the first of them.

"Hermes said: Be not so quick to evil thought, O Sun, for it is incumbent upon me to draw thee and thy brethren together and to unite them and make firm their union.

"He said: If thou doest that, thou doest well, but if not, then beware of the fiery sword behind thee.

"Hermes said: Since thou hast sworn that which thou has sworn I will take a yet more solemn oath: that I will not leave thee nor thy brethren until I have made them spiritual like myself.

"The Sun said: And I will swear an oath that if thou doest that with me and my brethren, I will not leave thee until I convert thy spirituality into earthiness, and thou shalt be with me.

"He said: Yes, I am satisfied. It is right that thou shouldst be the first to the kingdom before us all. And the brethren and the two sisters said: O Hermes, we give thee our obedience on account of thy just dealing among us and thy disputation with the Sun concerning us and thy justice to us" (1)

"Know", explains Jildakī, "that the watery soul is cold and moist; it is the key to this Art; it is the spiritual vinegar; it is

1. Tr. pp. 36-7; Es., Vol. II., pp. 87-8

Hermes; it is the hot water; and it is the sea physician. So understand, it has numerous names." The action of Hermes on his brothers, continues Jildakī, is the same as that of moisture on dryness, which the Sheikh, we remember, resembled to "the action of fire on wood" in connection with the preparation of the food-stuff. A poem of Sāhib, describing the same theme is quoted here.

Sheikh: "Hermes said: Know O assembly of my brethren, that I am acquainted with the obedience and assent to that which I desire, of you all except Ares.
 "The brethren said: Verily, the fiery sword will suffice thee for that which thou fearest from him.
 "Hermes said: But I say unto you, O Sun, a saying for which thou must pardon me and not blame me: know that all thy brethren have agreed upon volatilization.
 "He said: Why? By Allah, volatilization was none of their business, and they knew nothing thereof, but that is thy work, O Hermes; thou art the volatile and thou hast taught them that, and hast opened to them the Gate of Volatilization. And know that if thou volatilise and they volatilise with thee, thou wilt have destroyed my kingdom and made mine enemies to gloat over me; and thou wilt have cut off my seed whence is the means of subsistence of the husbandmen." (1)

Only a Sage, explains Jildakī, could properly handle the raw material of the Elixir, and produce the desired result. An ignorant fool, even if he obtains the raw material, does not know what to do with it, and he always fails in his attempts to produce the Elixir. Ares, in the above quotations, represents, continues

1. Tr., p. 37; Es. Vol. II. pp. 89-90.

Jildakī, the ignorant fool.⁽¹⁾ By 'the fiery sword' is meant the generative action of fire, which "unites likes and separates unlikes". By 'volatilization' is meant "the dissolution of the components of the stone in the water, which takes place before the first marriage and combination, and which constitutes a part of the first, concealed operation: the domination of the spiritual moisture over the earthy dryness and the elevation of the latter to the rank of a volatile". Hermes is mercury, and his brethren are the hard, dry, metallic bodies which are amalgamated with three times their weight of mercury. By the volatilization of the metallic bodies, the Sages imply their purification: the removal of their accidental qualities with the help of mercury.

Sheikh: "Hermes said: Rely upon that which I order thee, O Sun. Make for everyone of [all] thy brethren a coffin, then gather them together to thee, and seal the locks of the coffins [coffin]⁽²⁾ and put me in with them. And order thy guard to keep good watch over us and forget us not or we are all destroyed. And it will be due to thee from me that I cause to come out to thee the spirits of thy brethren, O Sun, and that I make them for thee a crown the like of which was never seen; and that I cause thee and them to be within me, and I will make thy kingdom vigorous and will exalt thereby thy name among those who precede thee and those who come after thee, that peace and blessing may rest upon thee and upon us with thee."⁽³⁾

1. In the course of a parable the same names need not consistently imply the same things. For example, Ares is a mineral on one occasion, and an ignorant fool on another.

2. (نواويس) (pl. ناووس)

3. Tr., p. 37., Es., Vol. II., pp. 92-3

In the above quotation, explains Jildakī, there is a gentle hint concerning the first, concealed operation; separation of the moist part from the dry part, and, then, domination of the former over the latter. The Sun is the dry part, and the brethren are the components of the moist part. Coffin is the vessel into which the dry part and all the components of the moist part are placed. The word 'guard' has here two meanings: the Sage and the fire. The 'crown' is 'the transparent essence', which is formed by the coagulation of the spirits of the brethren. Hermes said "that I cause thee and them to be within me", which means that he is capable of carrying "the spirit" and the oil within him", performing the action of the 'stick of Moses': taking the brothers of the Sun from the Mount Sina which has the rank of gold to the Mount Sina which has the rank of the Elixir. A poem of Ṣāhib is quoted here, which includes the following verse:

"He obtained the treasure with which Jābir,
Used to fleece Ja'far and Bermecides"

Sheikh: "(Ares said to Theodorus the King) Ostanēs said:
Save me O my God, for I stand between two exalted
brilliances (essences) (1) known for their wickedness,
and between two dim lights; each of them has reached
me and I know not how to save myself from them. And
it was said to me, 'Go up to Agathodemon the Great and
ask aid of him, and know that there is in thee somewhat
of his nature, which will never be corrupted'. And when
I ascended into the air he (it was) said to me, 'Take
the child of the bird which is mixed with redness and

spread for the gold its bed which comes forth from the glass, and place it in its vessel whence it has no power to come out except when thou desirest, and leave it until its moisture has departed". (1)

"Ostanes", says Jildakī, "is the generic sal ammoniac", and 'the two exalted essences known for their wickedness' are the ashes of the two sediments: the impurities of mercury and sulphur. "And the two dim lights are the divine water which is not possible to fix or make it stable by either ash or Ostanes". And Agathodemon the Great is the element of fire, the first essence, for it is the noblest and the most important element, it is the simple essence which never corrupts. Water, in fact, is liable to corruption, and the earth corrupts when mixed with the unlikes." A poem of Sāhib concerning the action of fire is quoted here. Jildakī adds that Ostanes is "the garland of victory (or the crown of victory), the generic sal ammoniac, the salt of the mountain, the thing derived from manure". 'The child of the bird' is the divine water, with which Ostanes mixes on volatilization. It is a compound of 'the extract of animate mercury and uninflamable sulphur'. The golden bed is 'the new body' which must be dissolved, coagulated and fed.

VOL. II. BOOK I.
CHAPTER II.

Explanation of the second section of the fourth part of al-Muktasab, upon evidence concerning the first, concealed, quantitative part.

Sheikh: "Gregorius the Sage, of the company of Pythagoras, said: 'O assembly of seekers after this knowledge, know that in addition to the ten parts some of which are moistness and some dryness, whether they be raw or properly matured, there is another thing in this Art, and that which ye wish to know thereof ye will never see in the books' ". (1)

There is no doubt, explains Jildakī, that maturing is carried out by the help of the fire and the water. And one who does not know how to extract the earth from the water and the water from the earth will never be successful,"and to this Ṣāhib al-Ṣudūr has referred in his poem rhyming indāl."

Sheikh: "Theophilus said: 'It is a varying essence of varying qualitative composition', but he meant thereby quantitative only. Know, O assembly of seekers after this knowledge, that the beginning of the operation is the mixing or perfect combination, and the sign by which ye know that ye are on the right path is the union of the moistness with the dryness, the mixture of part thereof with other parts, and the appearance of blackness in them. The second stage is the putrefaction until the substance becomes white or red, and the third stage is albification; for this it is necessary to mix therewith a little of the red or white water. The fourth stage is ablution of the substance seven times in (the appropriate vessel); the fifth stage is the combination of the moistness with the dryness, that is, the ashes. (The sixth stage is the first leavening of the substance as it is, and the seventh, putrefaction till it becomes white or red) (2). The eight (sixth) stage is the fourth leavening, which is the tinctorial poison. The ninth (seventh) stage is the formation of the tincture and appearance of the colours, and the tenth (next) stage is the leavening for 42 days and 3 hours. After that it is as is said by the Sages, "leave it, for it is now fixed." (3)

1. Tr., p. 38; Es., Vol. II. pp. 97-8

2. The part between parentheses does not appear in Es.

3. Tr., p. 38., Es. Vol. II., pp. 98-9

In the first stage of operation, explains Jildakī, one part of dryness, or earth, is kneaded with one part of moisture, or water. The compound is then left to mature, and at the completion of maturing, its colour becomes black - a sign of healthy combination. At the completion of the second stage, the outward colour of the substance remains black, but its inward colour becomes white or red. At the completion of the third stage, the white, or red, colour comes into the surface. The fourth stage is distillation of the water on a gentle fire, seven times in seven days. After distillation the water gets rid of all its oily contents. In the fifth stage the moisture completely unites with the dry part, which is referred to as 'the ashes' because of the smallness of its particles. At the end of the sixth stage the formation of the Elixir of Whiteness is complete, and at the end of the seventh stage the Elixir of Redness comes into being. The Elixir thus produced is then left for 42 days and 3 hours, during which time the volatile souls settle down permanently in their respective bodies.

Sheikh: "And one of them asked a Sage, 'What led you to say that magnesia is two?' And he said: One of them is stable in the fire and the other is not, but this volatile one also when it is mixed with

the former and joined therewith becomes fixed and stable in the fire. They are therefore two and they are those concerning which the Sages said 'The sulphurs are fixed by the sulphur'.

"A Sage of the company of Pythagoras said, 'I tell those who come after me that the 10 colours which the Sages called colours are not colours, but they are in Magnesia' ."(1)

The term magnesia is here employed in a metaphorical sense, explains Jildakī, It is, he says, an indication of the blackness of a substance. Moreover, magnesia is itself a compound having two componenet parts.

Sheikh: "A certain Sage said: 'O teacher, those who were before us gave the names of operations for these ten, and made that which was of the nature of copper distinct from that which was of the nature of lead, and the rest similarly'." (2)

By 'these ten' the Sages meant, according to Jildakī, the four natures plus the four elements, plus male and female. The Sages are in the habit of giving a new name to the substance whenever it changes its colour. Zosimas in his Muṣḥaf al-Hayāt (The Book of Life) has said, continues Jildakī, that "The beast of the Sages is that which they make of diverse things. At first it becomes a worm, then a viper and subsequently a dragon,

1. Tr. p. 39; Es., Vol. II. p. 102

2. Tr., p. 39; Es. Vol. II. p. 103

that is, at the beginning of the operation it (i.e. the material of the Elixir) is white like silver, then it takes the colour of chestnut, then the colour of gold, and then it becomes red like minium. The things originating from 'Ābār, ⁽¹⁾ namely, litharge, 'ibṣamīt, ⁽²⁾ and minium, ⁽³⁾ are proofs of our words. It (i.e. 'ābār) is one thing, but develops into different things with different colours, and at the beginning of this operation it is called 'ābār nuḥās". ⁽⁴⁾ Jildakī then gives a quotation from K. Muḥaj al-Nufūs (The Book of the Inmost Recesses of the Souls) of Jābir. "The Sages said", Jābir says, 'Our lead is not ordinary lead, nor our copper ordinary copper, nor our mercury ordinary mercury, nor our volatilization ordinary volatilization, nor our distillation ordinary distillation, nor our calcination ordinary calcination', and they were right." Jildakī, like Jābir, confirms the opinion of 'the Sages' and, as an example, compares 'the ordinary calcination' with 'the calcination of the Sages'. The former, he says, is corruptive and deprives the substances of its moisture, making it incapable of combination. The latter on the other hand, is generative and does not destroy the moisture of the substance.

1. See p. 261 above.

2. الإبشمت ؟

3. مبلقون : مبرقون

4. ابار نحاس

Referring to the plurality of names in the Art, Jildakī says that the Sages gave the name 'copper' to one of the ingredients used in the first combination, and also to one of the ingredients used in the second combination. But the two 'coppers' are not identical. "The copper" of the second combination, though derived from that of the first, is more perfect than the latter. Another ingredient, 'that is, the first magnesia' which is used in the first combination, is called 'the lead'. And there is also an ingredient used in the second combination, which has the same name. But, again, 'the lead' of the second combination is more perfect than that of the first: it is heavier, purer, and smells like musk. "And since the Sages in their true operation use copper, lead, white lead, silver, iron, gold, mercury, sulphur, cinnabar, tutia, magnesia, minium, litharge, arsenic, talc, salt, sal ammoniac, natron, saltpetre, vinegar, water, oil, tincture, spirit, soul, and body, so they gave each of these names to a separate operation by way of simile and with the intention of leading astray the ignorant fools".

Sheikh: "One of these Sages said, 'Even if he gave various names thereto in the combination he included them all in one name which he said Magnesia'.

"A certain Sage said, 'Whoso enters this Art, when he reads of the ten things which are not named with their proper names, must know what thing there is in Magnesia'".

"Their chief said, 'The ten things have not been given their true name', so one said to him, 'Name them, then, O Teacher'. He said, 'If I do I shall reveal this secret'. They said 'Nevertheless, do so' He said, 'Hermes both concealed and manifested when he said, The things contained in Magnesia are many, but we name them all by one name when we say, Take Magnesia'.

"A Sage among them said, 'I will say of Magnesia a saying, and look ye therein'. Their chief said 'Speak'. He said, 'I tell those who come after me that in Magnesia are the tincture and the tinctured and the male and the female'. Their chief said 'Thou hast done well and spoken truly,

and though thou hast not named the things by their names
yet thou hast explained of how many things Magnesia is
composed' " (1)

The statements of the Sages concerning Magnesia are very enigmatical and extremely difficult to understand, says Jildakī. Only a learned man, he goes on, could comprehend their meanings, "and we will explain for you the truth of this matter in the nearest possible way". Magnesia explains Jildakī, is a black, shining, brittle, crumbly, heavy mineral substance. It contains in its 'interior' eight different colours, namely, sorrel, red, yellow, green, blue, white, dusty and dark. Magnesia originates from steam and smoke, and its brittleness and dryness are due to the predominance of the latter component. It possesses an 'adhesive moisture' and smells like sulphur.

Now as to the eight colours contained in the 'interior' of Magnesia, the white is the colour of water from which the steam emanates. The sorrel is due to the combination of steam with the light part of the smoke. The yellow results from heating the oily constituent of Magnesia on the maturing fire. The blue, as well as the dusty and the dark, result from the burning of certain oily parts of Magnesia, and from predominance of 'the watery moisture' in it. The green originates from 'the thick oil', i.e., from its prevalence over 'the watery moisture'. The red originates from the oily constituent of magnesia when it is strongly heated. As to the black colour, it is concentrated red, and it dominates other colours when Magnesia is mixed with 'earthy parts'. Now, continues Jildakī, that we have learned how to extract the

colours of Magnesia, we have enough reason to believe that it is a component part of the material of the stone. "When mercury is solidified in the body of Magnesia, the first compound of the Sages is produced, that is, the moist parts of the stone are combined with its dry parts". It is, therefore, right to say, Jildakī goes on, that Magnesia is different from the mercury, though it originates in part from the latter and is to some extent similar to it. "Mercury is the soul of Magnesia, while the substance of fire is its body. And if you combine the water with the fire you will obtain the Magnesia of the Sages". It is no use putting the blame on the Sages when one fails to prepare Magnesia; for the cause of failure is the erroneous interpretation of their words. In order to be successful in the preparation of Magnesia one has to know, in the first place, its ingredients. To these one must then add 'the water of sulphur' and heat the mixture until it 'rusts'. The compound thus prepared is subsequently washed 'with the dew and the sun', in order to give it a more agreeable and pleasant appearance. All the four elements are represented in the constitution of Magnesia: "fire is the tincture, air is the viscous oil, water is the soul, and earth is the new body". There are two kinds of Magnesia: the brittle one and the tough. The production of the former is complete at the end of the first combination, and one of the substances used in this operation is 'the powdery talc' (1)

1. طلق المنسحق

The other kind of Magnesia is obtained at the end of the second combination, and here 'the laminated talc' (1) is used, instead of 'the powdery talc'. The preparation of the brittle Magnesia was described above. And now for the preparation of the tough Magnesia, the brittle Magnesia is treated with 'the divine water and the unflammable oil' until it toughens and "manifests the colour and the smell of musk. It then whitens (white Magnesia) and subsequently reddens, and by then the operation is complete and the Royal Magnesia, the material of the talisman, is produced".

Jildakī then gives two quotations from 'a certain Sage' and two others from Zosimos concerning Magnesia. But these quotations, as well as Jildakī's explanation of them, are very obscure and unintelligible. Jildakī concludes his explanation of the above excerpt from al-Muktasab with these words: "We explained for you their abstruse secrets, the understanding of which was difficult even for a person like Al-Ra'īs abī 'Alī ibn Sīnā, and for others. Verily, the statements of the Sages on this matter (i.e. on Magnesia) are contradictory and obscure".

Sheikh: "And of the evidences of the modern philosophers on this point (2) is the saying of the author of The particles of Gold (3) in his ode rhyming in tā':"

"The constitution of (him who is sick of a) quartan fever changes to its opposite as his moans ascend
To Jinn-like, human, kingly, aery, fiery; and his
breaths (aery; and his breaths are fiery)
And [it is] southerly, westerly, easterly and northerly -
every direction is the direction thereof" (4)

1. طلق المنح Perhaps laminated gypsum.

2. On Magnesia.

3. Sāhib al Šudūr

4. Tr., p. 39; Es., Vol. II. p. 114.

Before explaining the true meaning of the above oda, Jildakī gives a short account of the different types of fever. He observes that this is not the proper place for dealing with fevers, and that his account is, therefore, very brief.

Fever, he says, is an injurious kind of natural heat which emanates from the heart and spreads to other bodily organs. There are three main types of fever:

1. Quotidian fever, ⁽¹⁾ which concerns the spirits contained in the body.
2. Inflammatory fever, ⁽²⁾ which is caused by the excess of natural heat only.
3. Putrefactive fever, ⁽³⁾ which is caused by the putrefaction of bodily humours. This fever is either simple, ⁽⁴⁾ caused by the putrefaction of only one humour, or complex, ⁽⁵⁾ caused by the putrefaction of two or more humours.

Simple fever is of four kinds.

1. Caused by the putrefaction of blood, ⁽⁶⁾ This comprises three distinct forms of fever; a) augmentative, ⁽⁷⁾ b) contradictive, ⁽⁸⁾ a mild fever; and c) equable ⁽⁹⁾.
2. Caused by the putrefaction of yellow bile ⁽¹⁰⁾. This is called tertian ague and includes three forms of fever: a) hectic tertian (or consumption) : putrefaction ⁽¹¹⁾ ⁽¹²⁾

1. حمى يوم	5.
2. موناخس = مونوخوش = Gr. μόνος	7. متزاهدة
3. حمى العفنية	8. متناقضة
4. بسيطة	9. متساوية
5. مركبة	10. صفراوية
6. دموية	11. حمى القلب
	12. غيب اللازمة

(1) takes place inside the bodily vessels; (2) b) burning tertian:
 putrefaction takes place near the heart; (3) c) recurrent tertian:
 putrefaction takes place outside the bodily vessels. (4) 3. Caused
 by the putrefaction of phlegm. (5) This is called intermittent
 fever (6) when putrefaction takes place inside the bodily vessels.
 4. Caused by the putrefaction of black bile. This is called
 (7) quartan fever and comprises two forms of fever: a) hectic quartan: (8)
 putrefaction takes place inside the bodily vessels - this is the
 fever to which Şahib refers; b) recurrent quartan (9) : putrefaction
 takes place outside the bodily vessels.

But of course Şahib's reference to quartan fever, continues
 Jildakī, was only metaphorical. By 'fever' he meant soul from one
 point of view, spirit from another, and Magnesia from the third. (10)
 As to the soul, it is simple, cold and moist. But after being
 treated with the hot and dry spirit, its constitution changes, 'by
 the heat of putrefaction', and it becomes hot and dry. The spirit,
 on the other hand, is simple, hot and dry. But after being properly
 treated with the soul which is cold and moist, its constitution
changes, and it acquires the qualities of the latter. As to Magnesia,
 "it is the first compound of the Sages", and in order to become

1. داخل العروق

2. غب المحرقة

3. غب الدائرة

4. خارج العروق

5. بلغمية

6. النابتة

7. حمى الريح

8. ربح اللازمة

9. ربح الدائرة

10. اما الوجه الاول من قوله محمومة بلفظ

التأنيث اشارة الى الروح بوجه والى النفس بوجه والى الغنيسيا بوجه .

more suitable for operation, it must undergo a change of constitution, i.e., its blackness must be replaced by whiteness. Thus is explained the change of the constitution of the quartan fever. The moans of the quartan fever imply the supersession of qualities by one another in the soul, spirit or Magnesia.

By 'Jinn-like' is implied 'the impure spirit', which must be purified before it is used in the operation, so that it may not have any corruptive effect. By 'human' is meant the soul which supports life, growth and reproduction. By 'kingly' is implied the purified spirit. 'Aery' refers to the tincture of the spirit, which, like air, is hot and moist. By 'fiery breaths' are implied the effects of the soul, spirit, or Magnesia on bodies; for the smallest amount of each of these three is capable of exerting a strong influence on a large amount of the substance with which it combines. It is like the effect of, say, a tiny spark on combustible substances.

'Southerly' refers to the element of air, i.e., the oil which is a component part of Magnesia. 'Westerly' refers to the element of water, 'easterly' to the element of fire, and 'northerly' to the element of earth. Therefore 'every direction', i.e., every element, is represented in the constitution of 'the quartan fever', that is, soul, spirit or Magnesia.

Jildakī describes in detail the points of resemblance between the quartan fever on the one hand, and the soul, spirit or Magnesia on the other. But his comparisons are poetical and idyllic rather

than scientific and actual. He quotes from Ṣāhib another verse, (1) which he believes conveys the same meaning as the above ode. He explains the similes employed in this verse, but for complete understanding of this couplet in particular and the poems of Ṣāhib in general, he refers the reader to his book Ġāyat al-Surūr.

Sheikh: "See how the ancients and the moderns agree in meaning even though their words differ. Khalid ibn Yazid said in the section of his poem rhyming in qāf:

1. Whiten thy copper with the water of the mercuries, and thou wilt attain to abundance of provision with no need for a provider (with the grace of Provider) (2)
2. And combine the lightness of the water, if thou be wise, with the softness of the air concealed within the Zones.
3. This is that which the people of this Art called 'ābār, (3) if thou wast ignorant thereof, and 'a copper whose water is in the muhāriq' (4) (a fixed copper in the bare deserts)(5).
4. In their allegory it is the shining moon, and a sun whose course is not measured by minutes.
5. This is the female whose male is illustrious; she is specially chosen for marriage to the boy near virility.
6. They call her 'The West' in the allegory of their books, and speak enigmas in which they call her mate 'The Eastern'
7. This is that which they concealed and then aided one another in veiling that which was in it; they agreed upon deceit.
8. Combine (6) in it the four natures by coction in the fire, and fear not the misfortune of accident.
9. Then apportion it the known portion of the spirit, and understand the saying of the expert.
10. The number thereof in the books is six and four altogether; there can be no diminution for him who would hurry.
11. Now will 'o'erspread it blackness, and verily it is blacker than the shades of all other blacks; (7)

1. الذئب : واسود مبيض الذئب من فضل رازق
 2. Pt. and Es. :
 3. بيض الذئب من زئبق المجائز
 See p. 261 above.
 4. مهرق (muhraq): bare desert
 pl. مبارق (mahāriq)
 5. Pt: ونحاس ماوه في المبارق
 Es: ونحاس منبنا في المبارق
 6. Lit. Marry
 7. See p. 727 below.

12. And that is the meaning of their saying, 'verily, one will overcome nine of the Daughters of the Commanders'.
End of the Evidences on the first quantitative part,
by the favour of Allah the Exalted" (1)

"Know", explains Jildakī, "that the copper referred to as the ordinary copper is hot, dry, red, fusible, malleable; and there is in it blackness, latent whiteness, greenness, yellowness, blueness, hardness, softness, roughness, sharpness, saltiness, bitterness, acidity, and stench; these are its qualities". Its blackness, Jildakī goes on, is in its body and not in its soul, its whiteness is latent and becomes visible only by operation; its blueness results from the combination of its blackness and whiteness; its yellowness is brought to view when its redness is purified by operation; its greenness is shown in its verdigris; its hardness is displayed on melting; its softness manifests itself under the hammer; its roughness is in its body; its sharpness is caused by the domination of the fire; its saltiness is the result of its being mixed with salty substances; its bitterness results from the burning of oily substances contained in it; its acidity is due to the combination of its salty components with its soul; and its stench is caused by the burning of its putrid oils (2).

The copper of the Sages has all the properties of ordinary copper with the exception of one. And if one comes across a substance which possesses all the above mentioned properties save one of them,

1. Tr. p. 40; Es., Vol. II. p. 124.

2. The properties of a substance were not only those which were immediately manifest, but also those which it displayed after being combined with other substances.

he will be in possession of the philosophers' copper. Copper is considered by the Sages to be of four kinds: 1., the ordinary copper; 2., 'ābār nuhas,⁽¹⁾ which is an imperfect copper; 3., 'garland of victory', a name sometimes given to iron; 4., 'the plant-seedling and the nursling of the Art'. Some of the Sages gave the name copper to uninflamable oil; for the latter is pure like Venus, the heavenly prototype of copper.

The name copper is also given to anything which is hot, dry and fiery.

The copper to which Khalid refers is the ordinary copper and it therefore requires to be whitened. This is done by successive addition of appropriate moisture accompanied by the action of fire, until the copper becomes soft and white. The appropriate moisture referred to must not be from the animal kingdom, neither from vegetables incongruous to the nature of copper.

Jildakī then takes in succession each verse of the above poem of Khalid and tries to explain its meaning.

Verse 2: 'The lightness of the water' is 'the light water', and 'the softness of the air' is 'the hot and moist oil which has the nature of the air'. When the water is combined with the oil, the latter becomes 'thicker than the boracic waters'. There are many different kinds of waters, such as well waters, spring waters, sea

1. See p. 314 above.

waters, running waters, and the waters which contain sulphurs and salts. These waters are similar to one another in certain respects and different in others. Some of them are heavy, others are light, and each one has its own particular effect on other substances. 'The light water' to which Khalid refers has an unmatched, pure colour, and it is transparent and shiny. It is heavier than the oil, and when the two are combined they form a homogeneous compound. Jildakī quotes here a number of verses from Ṣāhib, describing the properties of the water and the oil.

Verse 3: "By 'Ābār he means one of the two parts into which the substance is divided in the first operation; namely, the part which remains at the bottom of the vessel. And the Sages give the name 'Ābār to the body which contains removable impurities; and they call it copper on account of its possession of the above mentioned colours".

Verse 4. : "Know that the Sages refer to the male part at this stage as 'the shining moon', on account of its whiteness, and they call it 'the sun' because of its masculinity".

Verse 5: By 'the female' is meant the second part of the substance in the first operation; namely, the part which ascends to the top of the vessel. The male part is that which remains at the bottom of the vessel, and it is likened to 'the boy near virility', because its masculinity is not yet complete at this stage of the operation.

Verse 6: "It is well known that the Sages refer to the female as 'The West', just as they refer to the male as 'The East'".

Verse 7: "That which the Sages concealed is the secret of the male and the female and the moment of their appearance in the world of the Art. For they are hidden in the matter just as the air and the fire are hidden in the water and the earth". 'The male' and 'the female' are potentially present in 'the matter', and it requires the skill of a Sage to make their presence actual.

Verse 8: This verse implies that the first stage of combination is not called 'marriage'. 'Marriage' begins after the application of fire; and the subsequent appearance of the black colour indicates 'fertilization' and 'pregnancy', which result from the combination of the four natures with one another.

Verses 9,10: After the conclusion of 'the first putrefaction' and establishment of equilibrium between the four natures of 'the compound', ten portions of 'the soul' are added to it. Four of these are 'wives', ⁽¹⁾ and the remaining six are 'young girls' ⁽²⁾. And some of the Sages have advocated, as mentioned in the first volume of this book, the addition of seven portions instead of ten.

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1. زوجات
 2. جواری

Verse 11. (1) "Blackness remains apparent during the whole period of the revolution of Saturn"; and the reason for comparing the compound to a tuft of hair is its softness and flexibility.

Verse 12. "The heat of the male balances the cold of nine of the women with whom he combines". The male is the victor and the females are the vanquished.

Vol. II., Book 1.

CHAPTER III. Explanation of the third section of the fourth part of al Muktasab, upon evidence concerning the manner of the beginning.

Sheikh: "A Sage said, when asked by a pupil of his, 'Should any operation be carried out before the operation proper (before this operation)?' 'Yes! an operation which is not an operation! He said, 'What is it?' He replied, 'Thou shouldst send the water upon the earth that it may be permeated thereby, for by the water it is dissolved and putrefied'. A certain Sage said, 'Thy water is a sword for thy earth [stone] and thy vessel will separate it' " (2)

Jildakī begins his explanation of the above quotation by refuting those who, unaware of the pitfalls in the Art, claim that they obtained their stone from the animal or vegetable kingdom and were successful in their operations. In this connexion he quotes Buyūn al-Barhamī, who says that 'the matter', in order to be made capable of combination, must be reduced to 'the prime matter' - an operation which he considers to be very difficult.

The first concealed operation, says Jildakī, consists, like the unconcealed operation, of two parts. In the case of the latter operation

1. This verse is not exactly the same in Pt. and Es.

Pt.: لأحلك من ألوان سود المفارق هنالك بعلوه سواد وان

Es.: تحاكى من ألوان سود المفارق هنالك بعلوه السواد ذؤابة

"Now will o'erspread it the blackness; a tuft of hair, resembling in colours the black shades of the partings of the fore-tops"

2. Tr., p.40; Es., Vol. II. p. 133.

the two parts are 'decomposition and combination', and in the case of the former, they are 'purification and approximation'. The first part of the first concealed operation consists of the purification of the water and the earth. And this is the part that the Sages have particularly kept secret. Jildakī quotes here a quatrain from al-Ṭuḡrā'ī who says that the Sages begin their description of the Art from the middle, omitting the preliminary part. Now the second part of the first concealed operation consists, says Jildakī, of successive combination and separation of the water and the earth, until the water unites with a certain part of the earth, acquiring a second nature in addition to its own, and the earth unites with a certain part of the water, acquiring another body besides its own; and this explains what the Sages mean when they say that "the water has two natures and the earth has two bodies". At the end of this concealed operation, the moist part has performed upon the dry part the action of fire upon wood, and as a result of this the stone is divided into two parts; one part ascends to the top of the vessel and the other part appears in the form of a very fine powdery calx at the bottom. Therefore, as the Sheikh said, the water in the first concealed operation acts like a sword, cutting the stone into two parts which are then separated from one another by the action of heat and the use of an alembic.

"Jābir", says Jildakī, "referred to the two parts of the first concealed operation in his book called Al-Arba' (The Four) and also in The Five Hundred and many other of his books, but in such a manner that no one except a Sage could understand him".

Sheikh: "Zosimus the Jew in his opusculè 'Distinction of Religions' (wherein he mentions the reason why Persians worship the fire - another was the Closed Books which their ancient Sages composed and which they interpreted wrongly so that they went astray and led others astray) says 'This our Art is from one stone with no second thereto'; meaning the prime matter from which the Elixir is formed and whose like is the ultimate essential (real) animal species named the Species of Species, with the accidental qualities appertaining thereto.

"He said, 'It is found (meaning the stone) with that which it contains of moistness and dryness like the prime matter before the separation of things from it by Form (meaning the separation of the heavens and the stars and the planets and the Three Kingdoms). And when we wish to operate we extract its moistness, and that subtle part which is extracted is waterⁱⁿ appearance but fire in its nature, and therefore they say that its water is its fire'." (1)

The Sages, explains Jildakī, spoke in their books of 'the light' and 'the darkness'. By 'The light' they implied heavenly bodies, celestial spheres, and pure, transparent essences. And by 'the darkness' they meant the impurities present in their stone. The Persian Sages attributed the Light to Yazdān, (2) and the darkness to Ahriman; (3) and they spoke of motion and rest, and of the properties of the things which originate from Light and Darkness. The students of the Art considered the Light to be the divine water, and by the Darkness they implied 'the dirt of bodies'. All this, particularly the Persian books on the Art, contributed, according to Jildakī, to the formation of a false belief; the sanctity of the luminous bodies in the heaven. But heavenly bodies in spite of their supposedly strong influences on things and events here below, were out of the infidels' reach. Whereas

1. Tr., p. 40-1; Es., Vol. II. pp. 138-9.

2. Yazdām or Ormuzd: the principle of good.

3. The spirit of evil.

they had access to fire, and impressed by the immense value of fire to the conduct of human life, they started to worship it.

"The Light of the stone", according to Jildakī, "is its fire, its air, and its water; and its Darkness is in its earth".

Here Jildakī quotes two excerpts from "K. al-'Ihrāq (The Book of Combustion) part of the 500 Books of Jābir". One of these quotations concerns the effects of combustion. "Verily", says Jābir, "combustion is only the cause of refinement in both cases. If we consider it with respect to the body, it inflicts punishment upon it; for it creates pain inside it. As to the spirit, its effect is chastisement, or refinement. And when they have been thoroughly punished, they get rid of their impurities". Other Sages, comments Jildakī, expressed the same opinion before Jābir. And those who did not understand the real meaning of the words of the Sages, fell a prey to their own fantasies. They based their religion on the idea of the sanctity of fire. Many of them endangered their lives and burned themselves in the fire, with the intention of purifying their body and soul. The Magians, says Jildakī, are still found in certain parts of India.

The second quotation from Jābir is very obscure and comprises allegories and speculations concerning the letters of the alphabet, particularly the five consonant letters of the word 'ihra'q, namely, 'hr'q. Jildakī agrees that this quotation from Jābir is obscure and adds that, for a complete understanding of the contents of

1. أحراق combustion.

K. al-'Ihra'q, one has to read a number of other books of Jābir, namely: K. al-Arkān (The Book of Principles), K. al-Hajar (The Book of Stone), K. al-Hudūd (The Book of Definitions)⁽¹⁾, K. al-Taṣ'īd (The Book of Sublimation), and K. al-Taklīs (The Book of Calcination). Jābir, he says, scattered his material irregularly all over his books, and his references to any particular subject are dispersed in many different places. But one who could get hold of the present book of Jildakī need not read the works of other Sages, including Jābir, on the Art. For Jildakī claims that he has collected in his book Nihāyat al-Ṭalab everything relevant to the Art.

As to the five consonant letters of the word 'ihra'q, he says that ḥ, r, and q, are among the 'luminous letters'; for they appear at the beginning of certain verses of the Koran. But the position of the two alifs (') is not clear. There is no doubt, he argues, that alif as a consonant standing alone (i.e. when it is not included in a word) is considered by all to be a 'luminous' letter. But the Sages are not unanimous in their opinion concerning an alif which appears in a word, no matter whether it is followed by a vowel or not. Some of them say that an alif which constitutes one of the letters of a word is 'luminous', others say it is 'dark', others 'luminous-dark' and still others 'dark-luminous'. The Sages, continues Jildakī, wearied their minds with these arguments and from the 'motion' of consonants by vowels they passed on to discuss the notion of motion in general. Those who tried to find out 'the first cause' of motion were not successful; for they wanted to get hold of something which was beyond their reach. But those who turned to study the

1. lit: limits.

properties of things as they are attained their object. These successful Sages are divided into two groups; theologians, and the students of secular sciences.

The 'real' animal species' to which the Sheikh refers is, according to Jildakī, the genus which includes all the species of the animal kingdom. Jildakī refers to the first volume of his book where he defined 'real species' and 'relative species'. And finally, he rejects once again the idea that the material of the Elixir is from the animal kingdom, and contends that it is definitely obtained from the mineral kingdom.

He says that the above quotation from Al-Muktasab appears to be confusing, and there seems to be no connection between the consecutive statements contained in it. But a closer examination would show, argues Jildakī, that there is no incoherency in the above quotation, and that its ambiguity is only due to the use of allegory. He says that, if he took each word in this quotation and tried to explain its significance, his account would become unnecessarily long. He considers it sufficient to point out that the central theme of the quotation is the first concealed operation.

Referring to the statement of Zosimus concerning the prime matter and the form, Jildakī says: "Know that metaphysicians are divided into two groups. One of these advocates the doctrine of indivisible particles and contends that all things are made up of particles which cannot be separated into parts by imagination, or incision, or perception. The second group reflects the idea of indivisible particles and maintains that substances are composed of prime matter and form; this group further asserts that the prime matter may not be separated from the form

nor the form from the prime matter. The purpose of the first group is to substantiate combustion and cohesion, and to prove that the causes and the forces are all perceptible and Recent (hādīt). And what the second group means is that the forces are imperceptible and Ancient (qadīm). Now both these groups believe that God, the Exalted, is One and shares His Kingdom with none. But actually those who hold that forces are perceptible must necessarily deny the existence of God; for although they desired absolute inviolability, yet they erred with regard to the more intricate attributes of God. And those who entertain the idea that things are composed of prime matter and form must inevitably renounce combustion and cohesion; and to judge by their appearances, these two phenomena prove that the world is Ancient. The truth, therefore, lies between the two groups, and is yet hidden from them; for God wishes to perplex men's minds with regard to the understanding of that which precedes perception. Had they understood that the truth is in the two opinions, there would be no quarrel between them. For Ancient and Recent are inconceivable without reference to time, and time is not understood except by circular motion. Would that I knew what is beyond the celestial spheres, what surrounds them, and how things are created there! Those who believe that minds, spirits, and forces are Recent must necessarily hold that the birth of every spirit is dependent on the birth of its body, and, therefore, when the latter dies ^{it} and undergoes decomposition, the former follows suit. This amounts to the refutation of resurrection, contrary to what they ultimately aimed to prove. Though according to their principles the rejection of this is impossible, yet they never attempted to substantiate

resurrection except on the basis of fictitious and transient principles which are liable to be overthrown in different ways. It is sufficient for us to say that the spirits, minds, and souls emanate from the Source of Emanation. But to prove that they are Ancient or Recent, requires a lengthy discussion which, for the present, we shall not undertake. And if Zosimus had not referred to the prime matter prior to the separation of forms, it would not have been incumbent upon us to say what we have already said".⁽¹⁾ The stone, continues Jildakī, is said to be similar to the prime matter, but this comparison is only metaphorical. And just as the prime matter in general is the source of apparition of forms, so the prime matter of the Elixir is the source from which all the numerous forms in the Art evolve. The Sages have spoken of 'the three Worlds'. These are the Upper World, the Lower World, and the Middle World, which is the world of the Art. For the material of the Art occupies a position between the spirits, souls, forces, emanation, motion, which belong to the Upper World, and bodies, forms, growth, generation, corruption, and substantiation of the Oneness of God and resurrection, which belong to the Lower World. And just as prime matter exists prior to forms and their separation (i.e. their multiplication), so the stone (i.e. the prime matter of the Art) exists prior to the formation of the products of the Art.

Referring to the statement of Zosimus concerning the extraction of the moisture, which 'is water in appearance but fire in its nature',

1. Es., Vol. II pp. 154-6

Jildakī says that the stone contains moist parts as well as dry parts and the extraction of these is an indispensable part of the operation. But what is actually meant by the extraction of the moisture of the stone, and how it has to be carried out? What did the Sheikh mean when he said "...until the moisture has performed upon the dry part ~ the action of fire upon wood"? What did Zosímus and other Sages mean when they said "Its water is its fire"? What did Jābir and other Sages mean when they said "The water of the stone is water in appearance but fire in its nature"? Is it possible to extract the moisture by the action of fire alone, or must certain other substances be used? In answer to the last question Jildakī says that neither the action of fire alone nor the addition of another substance would produce any result. The Sages have been silent as to the manner of extraction. No doubt the prime matter, that is, the stone, should be purified and its moisture must be extracted; and these are operations which the Sages carry out with no difficulty. And anyone who intends to follow the example of the Sages must know the origin of fusible bodies and the manner of their formation in the hollows of the earth, and then to try to imitate the action of Nature; this is the only way to success. Jildakī quotes in this connexion a poem of Šāhib and then goes on to say: "In spite of our knowledge, we studied the works of the Sages and their principles, and performed many experiments for a period of eight years before we came to understand the meaning of the technical words used by the Sages in their operation, and before we learned what was meant by the stone and the matter, or mastered the steps of the

*operation with the exception of the first
concealed*

operation, from the beginning to the end, in a scientific manner. The last-named operation we understood after seventeen years of unceasing study, as we mentioned at the beginning of the book".

Sheikh: "Ibn 'Aun (otherwise Ibn Mundhir) said (Zosimus said), 'Know that the stone is one, and when it is operated upon it separates into a higher part and a lower, and when the higher is returned upon the lower the higher is related to (hotness and the lower to coldness and when the cold is mixed with half its amount of the hot and separated again, the higher is related to) (1) moist hotness and the lower to dry coldness'." (2)

The words of the Sages, explains Jildakī, seem to be full of contradictions. For in one place they say "Its water is its fire", and in another place "the water is cold and moist", and still in another "the water is hot and moist". Similarly, they say in one place that the earth is cold and dry, and in another that it is masculine, i.e., hot and dry. The explanation is, says Jildakī, that the water is cold and moist in the liquid state, and it is hot and moist in the vapour state. Some of the waters, such as 'the sharp waters', are said to have a fiery nature on account of their quality to burn and calcine other substances. As to the earth, it is hot and dry when mixed with a fiery substance, but after the separation of the water and the air from it at the end of the first concealed operation, it becomes cold and dry. "And when the water is hot and moist, the earth should be cold and dry, to make the four qualities complete".

1. The part between parentheses does not appear in Es.

2. Tr., p. 41: Es., Vol. II., p. 160.

Sheikh: "And this is the material which Khalid mentioned in his Odes, (or in most of them) where he says, 'The beginning of this work is calcination of the stone, by the heat of a fire to which the fire of Hell itself is inferior (by the heat of a fire whose heat is as intense as that of Hell)' (1) By 'fire' he intended this moisture in its repeated action thereon, for it becomes calcined. Thus although the stone is one since its moistness and dryness are combined together, when it is split up into higher part and lower, the higher part can be compared to the water and the lower is like the earth. And when the higher is returned to the lower several times, the higher performs upon the lower the action of burning, and calcines it and connects it into dust upon which the operation is possible, and in which the putrefaction is successful with but little moistness. "To this Al-Andalusi, he of the Shudhur adh-Dhahab (may Allah have mercy on him!) referred in that part of his poem which rhymes in Hamza, where he says:

'We have a world whose water arises from its earth, and from its water and fire comes its air.

When its spheres hasten their revolutions the continual rotation of its heaven weathers its earth"

"He implies the burning of the earth and its calcination by the water which is extracted from it; its water is removed after its calcination in order that it may putrefy and dissolve, according to the two parts of the first operation. Know this therefore."(2)

Jildakī beings his explanation here with a quotation from K. al-Taklīs (The Book of Calcination), part of the 500 Books of Jābir.

"In the name of my Master", says Jābir, "this part is indispensable to the science of the Art, in the Externals as well as Internals. But it particularly concerns these bodies. We said in our K. al-'Ihrāq (The Book of Combustion) that mental combustion exclusively belongs to the spirit, and sensuous combustion to the body. But the preliminary part of calcination, O my brother, is not calcination. Understand this therefore. The spirits

1. Pt: بحر نار حرها حر مفر
Es: بحر نار وونها نار مفر

2. Tr., pp. 41-2; Es., Vol. II., p. 161.

and the souls do not bear calcination, for calcination does not take place except by intense fire. The souls, however, do not bear intense fire; they depart and run away from it. Now, calcination is only a means by which all the impurities of the body are removed and burned, whereupon it becomes clean and pure. But as the soul does not suffer from any illness similar to that of the body, it requires only the preliminary part of calcination, which does for it the same thing as calcination does for the bodies, that is, it completes its purity. Know this, therefore, and be clear thereon. And that which does for the soul the same thing as calcination does for the body, verily, in the name of my Master, you will find it to be sublimation. That is why we devoted solely to sublimation the book which follows this. Now that the purpose of calcination has been explained, we pass on to describe its different aspects.

"Verily, the calcination of each body is different from that of every other. There is that among the bodies which is pure in essence, like gold, the sole purpose of whose calcination is to convert it into dust so that it may combine with volatile souls and become capable of dissolution. The same thing is true of silver, but this contains a small amount of impurity and requires to be purified as well as powdered. As to the other fusible bodies, apart from these two, they have to be converted into dust and also purified by calcination. This applies likewise to the infusible bodies, according to their difference in purity"⁽¹⁾

1. See Holmyard, *Loécil*, for comparison with the Latin Works of Geber, P.P. 101-7.

Jābir then, says Jildakī, goes on to discuss "the calcination of bodies by fiery combustion⁽¹⁾ and the things which are mixed with them to help the fire to break them into separate parts". Jildakī now begins his comment on the above passage from Jābir by saying that "It has long been established by all the Sages that if bodies were burned in such a way as to lose their moisture, corruption would ensue and it would become impossible for them to return to their former state". Here again Jildakī points out that the calcination of Sages is different from ordinary calcination. The soul to which Jābir refers "is the mercury among the Externals, and the moistures of the stone among the Internals". Jildakī refers to Al-Ṭuḡrā'ī and his book Sirr al-Asrār (The Secret of Secrets) to substantiate the views of Jābir. Al-Ṭuḡrā'ī, says Jildakī, was one of the great Muslim Sages; he excelled all the successors of Jābir in knowledge as well as intelligence.

Jildakī refers also to Rāzī and says that he was in agreement with Jābir and wrote in many of his books "that the calcination of the bodies is effected by combustion, or corrosion, or amalgamation". Calcination by combustion, continues Jildakī, has already been explained. No benefit is derived from ordinary corrosion; for after that the substance "would not return to its former state; like white lead and verdigris". As to the corrosion of the Sages, it is of two kinds. The first one concerns the corrosion of the parts of the stone; and it was in this connexion that the Sages said "Pound it with the moisture until it is converted into rust". The second one concerns the corrosion of fusible bodies, which must take

1. احراق النارى as opposed to احراق المائى : 'watery combustion'

place after their purification. For if fusible bodies are rusted prior to their purification, it would become impossible to remove their impurities or to restore them to their former state. The object of corrosion of these bodies is to make them soft and capable of dissolution.

As to the calcination of fusible bodies by amalgamation, it may or may not yield the desired result: it is more successful with certain bodies than with others. Gold and silver form amalgams with mercury and may separate from it on heating. Three things may happen:

1. Calcination is effected by prolonging the duration of the operation.

2. Mercury is made to volatilize gold, or silver, by the action of intense fire. After their ascension to the top of the vessel, one of two things may be done; a) Mercury is separated from the body (i.e. gold or silver), and after that the latter becomes very soft and volatile, yet capable of being made stable by the Sages, b) If it were found impossible to separate mercury from the body, the combination of the two would be complete and they would only require fixation.

- 3., If the body did not ascend with the mercury to the top of the vessel, but remained at the bottom and was reduced to a very fine powder, then the desired result would be achieved.

Copper and iron because of their excessive dryness, may not be amalgamated with mercury, except by a great deal of labour. But even then their amalgamation may or may not result in their calcination and purification.

The two leads easily form amalgams with mercury, but instead of being purified by it they impart their impurity to it. That is because

they contain 'corrupt sulphurs'. It may be possible to reduce them to calx by repeated projection and separation of mercury. It may also be possible to volatilize or sublimate them with mercury and then separate them from it and wash them subsequently. But these are only possibilities: the amalgamation of either of the two leads with mercury usually results in corruption.

Jildakī then quotes a long passage from Sharḥ K. al-Rahma (Commentary on the Book of Mercy) of Jābir. The latter divides the Sages into four groups, as regards their views on combination:

1. Those who believe that a solid substance must be calcined, burned, and deprived of all its moisture in order to become capable of combination with the solvent souls and spirits.

2. Those who believe that without moisture no combination is possible. They say, for example, that while silver in its metallic state mixes with gold, it does not do so after being reduced to calx. They contend, therefore, that a solid substance combines more intimately with the spirits and subsequently with the souls, in its 'thick' and original state.

3. Those who, like the second group, regard the presence of the moisture in a solid substance as indispensable to its effective combination with the spirits and the souls. But unlike the latter group, they hold that pulverization of a solid substance improves its affinity for combination. They believe that when a solid substance is pounded to fine particles it gives the spirits and the souls a better chance of permeating its interstices. Pulverization may be brought about by calcination, but in that case one

has to make sure that the moisture of the solid substance is not destroyed.

4. Those who believe that dissolution is indispensable to an effective combination. They are themselves divided into four smaller groups:

- a) Those who favour the dissolution of solid substances prior to their combination with the souls.
- b) Those who favour the dissolution of spirits and souls prior to their combination with solid substances.
- c) Those who believe that since souls and spirits are light and volatile, the best way of uniting them firmly with solid substances is to volatilize the latter before combination.
- d) Those who believe that solid substances must be volatilized in conjunction with souls and spirits.

The views of the first group, the believers in the desiccation of solid substances, says Jābir, are wide of the mark. The second, third, and fourth groups are nearer to the truth. The complete truth lies in the words of those who said "It must neither be dead nor alive" (1)

Referring to the first of the two verses of a poem of Sāhib quoted by the Sheikh, Jildakī says that the words 'We have a world whose water arises from its earth' refer to the extraction of the moist part of the stone. The remaining words of the same verse, 'and from its water and fire comes its air', imply that when the oil, i.e., the fire, (hot and dry) combines with the water (moist and cold), the hotness of

1. A substance was said to be dead by the alchemists when it contained no 'moisture'.

the former overcomes the coldness of the latter, and the moistness of the latter overcomes the dryness of the former. That is to say, the resulting compound has the nature of the air: it is hot and moist. The second verse, says Jildakī, refers to the repeated projection of the moisture upon the earth and its successive separation from the latter, whereby the earth weathers and appears in the form of a powder.

Sheikh: "Jābir, the author of The Book of the Garden, said in the chapter on Calcination, 'Burn the body with the Divine water, not by fire'. For some of them in error burn it with fire and some with sulphur but they all do go astray, for the Sages meant by 'burning' a rectifying burning and not a corrupting one, in such a way that the substance burnt will mix with the moisture after the burning. Compare charcoal, which, although burnt, retains the power of taking fire, now this is unlike ashes which a corrupt burning has burnt; these have no longer the power of taking fire. Similarly, their stone if left without heating in the fire and we desire to putrefy it by the moisture which has been extracted and separated from it, will not putrefy nor dissolve nor turn white, since it has not been calcined nor powdered nor affected by the fire. In the same way, if it burnt by the fire with a corrupt burning, it is prevented from mixing with the moisture which has been extracted from it" (1)

To explain the above excerpt from al-Muktasab, Jildakī quotes a long poem of Ṣāhib and then goes on to interpret the similes contained therein. The latter speaks in his poem of the olive tree, the oil, the tamarisk, the capparid (a plant akin to the Caper), the stick of Moses, and its conversion into a deadly snake, the sacred valley, the dust, the darkness, the Mount Sina, the fire-brand, the sands, the waters, the rocks, and many other things. The olive tree Jildakī believes to be the stone. He gives the following reasons to prove that his interpretation

1. Tr. p. 42; Es., Vol. II., pp. 175-6

is correct. 1., The tree of the stone bears a fruit (gold) which like that of the olive tree is of great benefit to human beings. Further, just as the olive tree grows in the Holy Land, so the tree of the stone grows in the hearts of Prophets, Saints and Sages. 2., Olive is the most ancient tree, and the tree of the stone is, likewise, 'the most ancient principle among the elementary substances'. 3., The olive tree sends out a great number of branches, and so does the tree of the stone. 4., The most valuable product of the olive tree is olive oil, and the most valuable product of the tree of the stone is the oil without which the Elixir cannot be produced.

In this manner Jildakī interprets all the similes employed by Ṣāhib; but for a better understanding of the poem he refers the reader to his book Ġāyat al-Surūr, where, he says, he has exhaustively dealt with all the poems of Al-Andulusī. The central theme of the poem of Ṣāhib, which he quotes here, 'is the first concealed operation'. And anyone who fails to understand this operation after reading the allusions of Jildakī and other Sages to whom he refers in this connexion, has no hope of attaining success in the Art, "for beyond our explanation there is no other explanation except explicit divulgence". One of the reasons Jildakī gives for quoting a poem of Ṣāhib in connexion with the above excerpt from the Sheikh is that he wants the reader "to know the position of each of these three Sages; they are: Jābir, Ṣāhib al-Šudūr (the author of The Particles of Gold), and Ṣāhib al-Muktasab (the author of al-Muktasab)".

Referring to the statement of Jābir, quoted by the Sheikh from K. al-Ruda (The book of the Garden), "Burn the body with the Divine water,

not by fire", Jildakī reiterates the arguments, mentioned before, against the desiccation of the solid substances by improper calcination.

Sheikh: "And this is that which we desired to bring forward of the evidences, in short, so that the soul might not be wearied thereby nor the reader bored" (1)

The words of the Sheikh, and those of others whom he quotes, could be understood only by the Sages, says Jildakī. As for beginners they have to read Jildakī's explanations, and then apply themselves to meditation and practice. "Do not neglect the practice; for theory without practice is useless: it is like a tree which bears no fruit". Jildakī quotes similar statements from Sāhib and Jābir concerning the importance of practice.

Vol. II., Book I.

CHAPTER IV. Explanation of the fourth section of the fourth part of al-Muktasab, upon evidence concerning the method of beginning the first part of the first operation.

Sheikh: "Ares said to Theodorus when he asked saying, 'O Ares, what hadst thou in mind when thou didst mention the albification by means of the dew and the sun, and the albification by the fire and by the steam, that is twice; then thou didst mention the albification in the beginning of the operation - what led them to that, that they should mention the albification three times?'

"He said, 'Thou hast been subtle in questioning, O King, and hast shown the quickness of thy intelligence, and hast asked concerning a very difficult matter'. He said, 'Explain it to me'. He said, 'As for the first albification, it is the mixing; the second is the addition of the water thereto, - they call that the dew while they call the fire the sun; the third is when the rest of the water is poured into it, and they call that the albification by steam while they call the fire by its proper name'. He said, 'Thou hast done well, O Ares, in thy speech'" (2)

1. Tr., p. 42; Es., Vol. II., p. 197.

2. Tr., pp. 42-3; Es., Vol. II., pp. 198-9

Jildakī quotes two verses from Ṣāhib concerning the number of times the substance is whitened and subsequently blackened. The two verses in question were previously quoted by Jildakī on a number of occasions in the first as well as in the second (the present) volume, (1) According to Ṣāhib, there are two combustions, two whitenings (albification), and two blackenings. But Ares confirmed the statement of Theodorus that there were three albifications. Jildakī's explanation is that the first albification is part of the first concealed operation, while the second and third albification are included in the unconcealed operation. The first albification, continues Jildakī, results from the mixing of the moist part with the dry part, whereas the second and third albifications are due to the addition of the moisture and the application of a gentle fire. The Sages usually compare a gentle fire with the sun. The heat of the fire in the second albification equals that of the sun in Capricorn. In the third albification the heat of the fire is equal to that of the sun at Cancer.

Sheikh: "The King said to Ares, 'But what of the speech of Hermes in which he says "The great South wind when it acts makes the clouds to rise and raises the clouds (the vapour) (2) of the sea"? He said 'If the powdering is not successful the compound will not ascend into the top of the retort, and even if it do ascend it will not pour into the receiver. It is necessary to mix with it the first and second waters before it will ascend to the top of the retort'. 'That', he said, 'is the Great South Wind?' He said, 'Yea, O King. Verily these two waters

1. see p. 269 above.

2. Pt: غمام Es: بخار

when they are mixed with the first water act upon it, and cause it to ascend to the air, and there goes up with them a water like the sea (and there goes up with them the vapour of the sea), (1) meaning by that the sulphur which is not burnt up in the vessel'.

"Concerning that matter also, Al-Hasda said, 'Mix the distillate with many things until the two become three and the one, two' (The author said,)(2) By 'the two' are meant the moistness and the dryness, and by the third the tincture produced from the dryness which is in the moistness (,thus the two becomes three. By 'the one' is meant the moistness) (3), and when the tincture enters it it makes two" (4)

It is well known, explains Jildakī, that the south wind brings with it plenty of rain, particularly when it is accompanied by the west wind. For the south wind is hot and moist and the west wind is cold and moist, so when the two combine the amount of moisture in the atmosphere increases, and the thick clouds which are thus formed transform into rain as coldness prevails over hotness. The east wind is hot and dry and disperses the clouds when it blows. Now all this, continues Jildakī, bears a resemblance to some of the operations performed in the Art. When earth (said to be cold and dry by some and hot and dry by others) combines with water (alleged to be hot and moist by some and cold and moist by others), an equilibrium is established between the weights of the four natures, while there is no outward motion in the compound. It is only after the completion of the first putrefaction and the addition of the second and third portions of the moisture, that the inward motion of the compound takes an outward turn and becomes manifest; and that is when, metaphorically speaking, 'the

1. Pt. فارتفع معها ماء كالبحر Es. فارتفع معها بخار البحر

2. Does not appear in Es.

3. Does not appear in Es.

4. Tr., p. 43; Es., Vol. II., pp. 201,203

south wind' blows and 'the clouds' begin to rise.

And if the powdering, Jildakī goes on, is not successful, the 'coarse part' of the compound will not follow its 'light part' to the top of the vessel. A successful powdering results from a complete putrefaction and the addition of a sufficient amount of the moisture. 'The coarse part' together with 'the light part', do not comprise all that there is in the compound; For by 'the coarse part' is implied only that part of the compound which dissolves in 'the light part' and ascends with it to the top of the vessel. 'The coarse part' of the compound is, therefore, 'the light part of the earth', which is also referred to as 'the oil' or 'the incombustible sulphur'.

The distillate, says Jildakī, is not to be mixed 'with many things', and the words of Al-Hasda to that effect must not be interpreted literally. For there are only one, or two, or three things which make up the compound. 'One' refers to the compound as a whole. By 'two' is implied the moist part and the dry part, and by 'three' is meant the soul, the spirit, and the body. This is one way of interpretation of the statement of Al-Hasda; the other is the one presented by the Sheikh.

Sheikh: "The King said, 'O Ares, what of the saying of Al-Hasda that in the earths is a mighty work?' He said, 'It is because some of them are natron-like, some alum-like, and some vitriol-like'. He said, 'What profit is there in this, O Ares?'
 "He said, 'As for the natron-like, it is that which powders the compound (and ferments it) (1), the alum-like is that which putrefies the compound, and the vitriol-like is that which whitens the compound (and reddens it) (2). The King said, 'And are these three the beginning of the work?' Ares replied, 'They are the beginning and the end thereof' (The King said 'Thou hast been obscure, O Ares'. And he said, 'How so, O King?') (3) He said, 'Explain what they mean by this saying'. Ares said, 'As for the

1. Does not appear in Pt.

2. Does not appear in Es.

3. Does not appear in Es.

natron-like, this is the compound which is mixed with the water and is thereby powdered incompletely; the alum-like is the second water, that by which the compound is putrefied until it is decayed, and the third is that which is called the vitriol; it is this which whitens (decomposes) (1) the compound. Therewith it is necessary in this operation that it should be sublimed in a tube alembic"(2)

"Know", explains Jildakī, "that the earths in this Art are divided into two kinds; External and Internal. As to the External, they are those which do not enter into combination, and they are three, as mentioned by the Sage: natron-like, alum-like, and vitriol-like. And it is necessary for the Sage to examine these three things in order to know the point of resemblance between them and the Internal earths of the stone". According to Jildakī Aristotle wrote in his K. al-Aḥjār (The Book of Stones: Lapidary) that natron washes the substances, removes their impurities and enhances their beauty. And alum, he said, rejuvenates and purifies substances, while vitriol blackens them. "Now," Jildakī goes on, "the similarity between the natron and the natron-like thing in the stone is that the former is a solvent which penetrates into the depths of the substances and removes their impurities, and the latter, as mentioned by Ares, 'powders the compound', that is, softens it, dissolves it, and 'ferments it'. By this last he meant that it turns the compound into a swelling dough, and that is similar to what natron does to the dough: it inflates it and causes it to grow bigger". The natron-like substance contained in the stone, when mixed with the water, does not dissolve in it, though together they form a homogeneous compound; and that is the meaning of incomplete powdering to which Ares refers. The compound

1. Pt. يبيض Es. ينقض

2. Tr., pp. 43-4; Es., Vol. II., pp. 203-4

formed in this manner is 'the first compound', which is partly male and partly female. The water at this stage is referred to as 'natron'.

The similarity between the alum and 'the alum-like thing in the stone' is that both of them possess the power of retention: the former absorbs and retains moisture, and the latter imbibes the light essences of the compound and preserves them from corruptive putrefaction.

As to the vitriol, it is sharp, sulphureous, and fiery; it is a solvent as well as a coagulant. When it is solid, it coagulates the liquids; and when it is liquid, it liquefies the solids. 'The vitriol-like thing in the stone' possesses similar properties: it decomposes the compound, dissolves it, and makes the light parts of it to ascend to the top of the vessel.

Thus the three natron-like, alum-like, and vitriol-like moistures, after their ascension to the top of the vessel, unite with one another and combine their forces to imbibe and retain the oily part of the earth. The three moistures are, at this stage, in the form of vapour, while the oily part of the earth is in the form of smoke. Now all this, says Jildakī, points to the conclusion that there is no need for the stone to be supplemented with External substances, for it contains every one of them within itself, either actually or potentially. Therefore, the only thing the Sages have to do is to expose the hidden properties of the stone by means of operation. The presence of so many properties in the stone explains why it has a multitude of names.

Sheikh: "Theodorus said, 'Al-Hasda says that the every time though enfeeblest the body by coction the spirit penetrates into the subtle parts of the body.' Ares replied, 'O King, if thou hadst seen the operation thou wouldst be certain of that which they

mean thereby'. He said, 'How should I be sure when I myself have seen these things as bodies combusted?' He said, 'Now at this point he who enters upon this Art is often lost, for he sees bodies combusted, and turned to ashes, and he throws them away, and knows not, O King, that that which he needs is in these burnt ashes. For the spirits (1) of these combusted and dead things separate and are no longer able to resurrect those burnt bodies, and when they go out from their bodies, they become concealed in that water which is hidden within those ashes, so that although the things be destroyed, yet their spirits remain with the copper in that water. For copper is not volatilised nor changed, on account of its power over the fire and its stability therein. And if we found a thing stabler in the fire than that our copper we should certainly use it in our operation; now every time copper is burnt it increases in strength and it is therefore suitable for our operation. So mark this copper, O King, and know that no tincture is ever produced except from it'. He said, 'And is it one?' He said, 'No, but it is a compound of copper and various other things compounded together in agreement so that they become one. And know, O King, that substances become varied in nature every time their operation is varied' " (2)

The meaning of the statement of Al-Hasda quoted by Theodorus is, according to Jildakī, that the spirit, i.e., the oil, dissolves the light part of the body. "For the water penetrates into the oil, and the tincture penetrates into the water".

By 'combusted bodies', Ares meant the disintegrated and decomposed bodies. And the combustion, i.e., decomposition, of fusible bodies is not carried out by fire, which would make them corrupt, but by 'the divine water'. Combustion causes the soul to depart from the body, never to enter it again, unless the latter is made 'capable of living' by appropriate operation. By 'the copper', Ares meant 'the incombustible oil' which

1. روح : I have invariably taken this to mean 'soul', and نفس to mean 'spirit'.

2. Tr., p. 44: Es., Vol. II., pp. 206-7

owes its immunity from destruction by fire to being closely associated with water during the whole period of coction. The incombustible oil resists all the fires employed in the Art, with the exception of the smelting-fire. It can only resist the smelting-fire by taking refuge in a body and forming a stable compound. Jildakī warns the reader not to mistake 'the copper', i.e., the incombustible oil, for 'the stable body', for the latter is also referred to as the copper.

The rest of Jildakī's explanation with regard to the last quotation from Al-Muktasab is no more than a mere repetition of the Sheikh's words, supplemented with few poems from Sāhib.

Sheikh; "Khalid Ibn Yazid said in the rhyme of hamza,

1. 'O thou who seekest after the Art of the Egyptians, and minutely enquirest what things they made,
2. Examine well that which I say (may it be a ransom to thee!) and be not like the ignorant man who wanders aimlessly in his blindness.
3. When thou hast regulated it well by combination and coagulation in the beginning,
4. And hast made it of the four known things - two earths and a fire mixed with a water,
5. Whose weights at first are not equal, but equal when they are gathered together,
6. Crystallise it (it will crystallise easily), when thou wilt see it as it were a yellow wax.
7. Place it in the hollow of a wine-jar with a lid and close the mouth with the lid;
8. Then let it dry until thou seest that it has become as dry as the solid rock.
9. After this, heat it carefully and slowly, and thou wilt find it like black charcoal,
10. Hard to the touch, and heavy. Powder it as Philosophers' powder is powdered,
11. By placing it in a fire at a hatching temperature (and take care!) for seven days and twice as many more;
12. Then carefully separate the water from its solid by distillation per descensum' " (1)

Jildakī begins his explanation here by giving an interesting account of the history of alchemy.

The ancient Sages, he says, were able, by virtue of their knowledge, to predict events long before they took place. They forecast Noah's flood and, in order to prevent the eventual destruction of 'their philosophy', they engraved their inscriptions on stones for the benefit of those whom they thought would follow in their footsteps after the catastrophe. And since they knew that the post-diluvian languages and scripts would be different from their own, they used pictures instead of letters in their inscriptions. On the basis of their findings in the Art they came to the following conclusions: a) that spirits and souls, being among the entities which belong to the Upper world, will survive the destruction of bodies; b) that the Upper world which is made up of 'concurrent simple essences', and the celestial spheres with their perfect circular motions, are indestructible; and c) that there exists a first Mover who created all the worlds and set the celestial spheres in motion. They were fully convinced that after the flood the souls and spirits would return to the Lower world, (i.e., the earth) and occupy those bodies which, because of the firmness of their constitution, had remained intact. But they wrongly interpreted the return of the souls and spirits to the Lower world as resurrections; for they did not believe in the continuation of life in another world besides this one. And that was why they took great care to preserve the bodies of their dead, burying them together with all their treasures in fortified tombs in preparation for the descent of spirits after the cessation of the flood.

The Deluge occurred, Jildakī goes on, death and destruction ensued; and when it was over the world came to life again. Then God sent his Prophets, and there appeared philosophers who traced their descent from Noah. Gradually, the views of pre-diluvian Sages and the writings of Hermes Trismegistus came to be known. Dahhāk, Jamšīd, and Farīdūn, the Persian kings, persuaded the priests to collect all the then available philosophical knowledge including the instructions of the ancient and contemporary Sages, the revelations of the prophets and holy spirits, as well as their own inferences. Thus, philosophy continued to be studied until the days of Šaddād. He was himself a great Sage and founded the famous Garden of Iram with all its jewels and treasures, priests and porters. Then came Moses, his wealthy opponent Korah, Solomon, David, Jāmāsf (1), Jewish philosophers, Socrates, Plato, Alexander, Aristotle, and other Greek Sages. They were followed by Muslim savants: the Caliph ‘Alī; Khalid b. Yazīd, 'the first Arab to study philosophy'; Jābir, a pupil of Ja‘far al-Šādiq and a friend of the Barmecide vizier, Yaḥyab. Hālid, and his two sons, Fadl and Ja‘far. By the instigation of Jābir, continues Jildakī, the Caliph Hārūn al-Rašīd imported from the Roman Empire many philosophical books which were turned into Arabic by Ḥunayn b. Ishāq and Ibn Boḥtīšō.⁶ The second importation of the Greek books took place under the reign of M‘amūn. Jābir was succeeded by other Muslim Sages, such as Al-Fārābī, Al-Rāzī, Ibn Waḥšīyya, Al-Ṭuḡrā‘ī, Al-Majrītī, Ibn Miskawayh,

1. Perhaps the alleged son of the prophet Daniel, celebrated in the East as a skilful physicien.

Ṣāhib al-Ṣudūr, and others. "As to Al-Ra'īs Abū 'Alī Ibn Sīnā, he plagiarized from the books of Al-Fārābī and wrote on every science, except this Art, which he was not able to understand, and on which he was, therefore, confused. It was the same with Ḥunayn b. Ishāq and Abū al-Riyhān al-Bīrūnī". But Al-Bīrūnī, says Jildakī, vacillated between one opinion and another. He sometimes considered the Art to be a true science, and at other times a false one.

"So the Art continued to be studied until the present day; it rose and fell in estimation, in accordance with the merits of those who made it their profession. But now-a-days it has fallen into abeyance because of the small number of those engaged in its pursuit". Jildakī then contrasts the lack of enthusiasm among the people of his own days with the unflinching zeal and eagerness of the men of earlier centuries. Where is, he asks, that tenacity and singleness of purpose which enabled the ancient Sages to endure every trouble for the sake of deciphering the picturesque writings of the Egyptians and understanding the secrets of the Art? These ancient Sages, he says, by virtue of their superior knowledge, surpassed in power all their rivals, including the kings, and attained every object they set themselves and every hope they entertained in this world. And if the reader of The End of the Search is as ambitious as the ancient Sages, he must try to understand the meaning of every sentence in every chapter of this book.

After the completion of his account concerning the history of alchemy, Jildakī turns to explain the poem of Khalid. The following is a summary of what he had to say with regard to each one of the verses contained in

that poem.

Verses 1, 2: Anyone who seeks after the Art, must consider two important things. He ought to know, in the first place, that he may not achieve success in the Art without understanding its principles and theories. Secondly, he has to realise that the Art is not an 'open', but an 'occult' science. Ibn Sīnā, in spite of his immense knowledge, failed to understand the secrets of the Art and, therefore, rejected the possibility of transmutation. His failure was the result of his considering the Art as an 'open science'. He rightly observed that there were plenty of contradictory statements in the books of the alchemists, but he made no attempt to resolve those contradictions by retaining the true assertions and rejecting the false ones.

Verse 3. 'When thou hast regulated it...', says Khild, and by 'it' he means the prime matter of the Elixir.

Verse 4. The 'four known things' are the four natures, namely, hotness, coldness, moistness, and dryness. "And since it is not in our power to mount upon the air or to collect it, or to reach the fiery sphere, we substitute for the air that which contains its essence, and we do the same as regards the fire".

Verse 5. The meaning of this verse is identical with that of the statement of the Sheikh explained before: "It is from little and much, then becomes equal". By 'little' is meant the earth, and by 'much' the water; for the equilibrium between the four natures is established only when one part of the earth is combined with three parts of the water.

Verse 6. It refers to the first combination of the moist part with the dry part, whereupon each part coagulates the other, the colour of the compound turns yellow, and the odour of semen, indicating marriage, is smelt. The yellow colour is usually deeper when the combination has been preceded by a good powdering.

Verses 7, 8. The 'wine-jar' is the vessel which 'according to Buyūn al-Barhamī' is '12 fingers' long, has two lids, one of them 'blind' and the other 'open', is wide enough inside 'to let in the hand', and is mounted upon a square furnace. This vessel, says Buyūn, is suspended in^α a cauldron containing ashes, and a space equal to 'two fingers' separates the vessel from the ashes. Jildakī remarks that there is no objection to the furnace being round instead of square, but, he says, it must have two apertures to let off the smoke, one on top and the other on the right side. The joints of the vessel, continues Jildakī, must be sealed, as mentioned before, (1) with a lute made of "gypsum, glue and calcined salt dissolved in water". Some of the Sages have suggested the use of mortar, a mixture of "cotton-wool, olive oil, lime, and clay". One may argue that since the fire is very gentle at this stage, the souls would not volatilise, and there is, therefore, no need of sealing the joints with strong lutes, similar to those mentioned, in order to prevent their escape. It is true, says Jildakī, that at this stage the fire is very gentle and that its heat does not exceed that of a bird at the time of hatching, or that of the womb, or that of the stomach. And, indeed, the use of a violent fire at this stage of the operation would result in the decomposition of the substances employed. But there are two reasons for sealing so firmly the joints of the vessel. In the first place, it

1. See p. 158 & etc. above.

is done in order to prevent the air from entering the vessel; for the presence of air is harmful to proper putrefaction. Minerals, vegetables, and animals, are all generated in the absence of air. Brittle minerals, having been generated in places near the surface of the earth with little protection against the injurious action of air, are extremely dry. That is because their moisture has been absorbed by the air. Secondly, in spite of the gentleness of the fire at this stage, the very light parts of the compound volatilize and after reaching the top of the vessel descend to the bottom in the form of dew. It has thus been proved that the sealing of the joints is undoubtedly necessary.

Verses 9, 10. If the compound were found to be hard and heavy, its constitution is sound. But if it were hard and light, there would be no doubt that corruption had ensued. To 'powder it' means to dissolve it in ^{the} water.

Verses 11, 12. The period of 'seven days and twice as many more', that is 21 days, is considerably less than the one suggested by Buyūn al-Barhamī. This discrepancy could be explained in four ways:-

1., The period of 21 days represents only one-third of the whole duration of operation (i.e., putrefaction). At the end of 21 days 'the first marriage' is over, and after 63 days dissolution is complete: that takes us to the beginning of distillation. 2., The period of 21 days represents the whole duration of putrefaction, shortened due to a proportional increase in the speed of operation. 3., If we multiply 7 by 14 ('twice as many more'), we get 98, representing the number of days from the beginning of the 'first marriage' to the end of dissolution, that is, the beginning of distillation. 4., The product of 7 by 7 is 49, which

if added to 98 ('twice' 49) makes '144',⁽¹⁾ representing, according to some of the Sages, the number of days required for putrefaction. Now, says Jildakī, all the four figures given above, with regard to the duration of putrefaction, are valid. The inequality of these figures is due to the application of different methods of operation - the weights of the substances used as well as the intensity of 'the two fires' vary with each method.

Sheikh. "And he (Khalid) said in the rhyme of dāl,

1. 'The tincture of the People (of this Art) is from a single stone; it is brilliant in colour and of a refulgence unique.
2. They call it 'The East' and 'The Land of Kaush', and it is called also copper and iron,
3. And 'The Water of Light' which shines with the light of the moon (2) when she rises auspiciously.
(And 'The Water of Well', wonderful to look at, and with the limpidity of the moon when she rises auspiciously). (3)
4. They call it also 'The West' and 'Egypt', so understand; and as 'The Beneficial Lead' too is it known.
5. When they are harmoniously united by employing the correct weight and an elegant mixing on a sound principle.
6. And the air receives the dryness of the earth and the heat of the sun in a glorious reaction,
7. And thou risest to mix it by powdering and rubbing, thou wilt attain thy wishes, yea and more,
8. For those ten (youthful) (4) beautiful natures will banish all care from the lovesick swain.
9. They call it Abar and 'copper' also, so that it may be concealed from both friend and stranger.
10. Place it in a vessel within another vessel, and close the joints with strong clay.
11. And set it skilfully (And set it propitiously) (5) in the furnace upon a hatching fire,
12. Let the period during which it is heated be the time of Moses' stay (upon Sina); then take it out as a solid resembling ice.
13. Then add to it three times after this sufficient quantities of the noble white substances,

1. The actual figure being 147.

2. بدر : lit. full moon.

3. Pt.: وما نبر بضي نقي Es. : وما بشر و منظره بد بع

4. Pt. كصفوا البد ريطلع بالسعود Es. : كصفوا البد ريطلع بالسعود
عشر في الاثر كمنصب حزن

5. Pt. : وتنصب في الاثر كمنصب حزن Es. : وتنصب في الاثر كمنصب خل

14. And let it be sublimed in a vessel containing steam, concealing the fall of that which is called the rust.
15. This will occur in 160 days, divided into four separate periods,
16. Increase its fire every day a little more than a sixth, with wise discretion,
17. And a blackness like pitch will cover it, but this is easily removed and driven away,
18. The souls will descend to thee submissively and humbly like a fearful fugitive,
19. So separate them and place them aside, and divide the excess of the spirit which has been prepared." (1)

Jildakī's explanation with regard to the above poem of Khalid is as follows:-

Verse 1. The stone is made of different substances which, after their combination, form a homogeneous compound, unique in essence, action and beauty.

Verse 2. 'The East' is the male part of the stone, so called because of its hotness and dryness. For the same reason it is also referred to as 'The Sun'. 'The Land of Kaush' is 'The Land of Can'ān, son of Kaush, son of Namak, son of Ham, son of Noah,' in short, the Holy Land. It is located at the end of the third and the beginning of the fourth climate; it is a land of high mountains with plenty of springs and a hot and moist weather. Just as the streams of water come up out of the earth in the Holy Land, so the water of the stone is extracted from its male part; that is one point of resemblance between the male part of the stone and the Holy Land. Though the male part of the stone is hot and dry, yet it contains certain lightelements which, like the weather of the Holy Land, are hot and moist; this is the other point of resemblance. The comparison of the stone to copper is based on the presence of tinctures in both.

And its comparison to iron rests on the ground that the latter, besides containing a number of colours and being hard and strong, is cold and dry, externally, but hot and moist internally.

Verse 3. Here Khalid refers to the second part of the stone, that is, the female component. 'The water of the well' is thicker than both 'the water of the Stream' and 'The water of the spring'. The relative thickness and heaviness of the well-water is due to its being remote from sunshine and immune from the effect of winds. For opposite reasons, and because it flows over soil instead of rocks or gravel, the stream water, that is, the running water, is lighter and thinner than the other two. The spring-water, being nearer to the ground than the well-water, is lighter than the latter and yet heavier than the running water. Now why is it, someone may ask, that the water which flows over rocks becomes heavier than that flowing over soil? He may argue that rocks and gravel do not dissolve in water and, in contrast with soil which dissolves in water, should not increase its heaviness. The answer is that soil and clay, though they may make the water look dirty, could be separated from it very easily, whereas the dissolution of 'the light and transparent parts' of rocks and gravel in water is of a more fundamental and permanent nature. So far, continues Jildakī, we spoke only of the 'simple waters' which do not contain impurities, such as salts and sulphurs. As to all other waters, namely, those which contain salts, sulphurs, or similar substances, they are different in taste, odour, colour and other qualities, according to their locality and the depth of their sources from the ground. From all this it is possible to conclude that there are two points of resemblance between the female part of the stone, that is, its water, and the well water.

In the first place, they are both thick; and in the second, just as the well water is carried upwards by means of pail and pulley, so the water of the stone is made to ascend from the bottom to the top of the vessel.

Jildakī then goes on to explain why Khalid compared the well-water to the full moon. 'The Most auspicious', he says, is the name given to the mansion of the moon situated in Aquarius, which is hot and moist. When in Aquarius, the moon is full and is in opposition with the sun, then in Leo, a hot and dry zodiacal sign. Intrinsically the moon is cold and moist, whereas the sun is hot and dry. But when the moon is in opposition with the sun, its coldness is suppressed by the hotness of the latter and it becomes hot and moist. So both the full moon and the well-water are limpid, hot, and moist, and they therefore resemble one another.

Verse 4. 'The West' and 'Egypt' both refer to the female component of the stone. The west is cold and dry, while Egypt is hot and moist. It appears therefore as a contradiction in terms to compare the female component to the west as well as to Egypt. The explanation is that the female component is mainly cold and moist but contains also certain elements which are hot and dry. In fact if the male component of the stone were wholly hot and dry, and the female component, cold and moist, their combination would result in corruption. In general, when two substances have exactly opposite qualities, no benefit is derived from their combination. For a generative combination, the two or more substances used must be similar in certain respects and dissimilar in others. In this connection Jildakī gives two quotations from K. Al-Aḥjār (The Book of Stones) of Al-Majrītī, in which the latter makes a comparison between

copper and the two leads (black and white) (1)

Venus (copper; hot and dry), and Saturn (Black lead; cold and dry), he says, have no liking for each other. Only a very gentle heat is required to separate them from one another after they have been precariously combined. For 'black lead' cannot bear the stench and the unpleasant taste of copper. On the other hand, Jupiter (white lead; cold and moist) combines with copper forming a stable compound called isfādarviyya. (2)

Jildakī says that the reason why 'the white lead falls in love with copper' is that they are both auspicious and to some extent similar to one another. Majrītī compared the two leads with copper, and Jildakī now proceeds to make a comparison between them and Mars (iron : cold and dry).

Both iron and 'the black lead', he says, are cold, dry and black. But iron is harder than 'the black lead'. They are, therefore, similar as well as dissimilar to one another, and it is possible to dissolve either of them in the other. The similarity between iron and 'the white lead' is that the Exterior of the former is identical with the Interior of the latter and vice versa. But there is also dissimilarity between them: 'the white lead' melts quickly while iron does not. They do not mix with one another unless they undergo a proper treatment.

Jildakī then remarks that the comparisons made above hold good also with regard to the constituent parts of the stone referred to as copper,

1. الرصاص الاسرب and الرصاص الانك ; My impression is that the former is lead, and the latter, tin, corresponding respectively to the plumbum nigrum and the plumbum album of Pliny.

2. اسفادرويه or اسبازويه ; c. f. p. 276 above.

iron, black lead, and white lead. The Sages, he says, have given the names 'iron' and 'copper' to one and the same part of the stone, 'the first extract'. It is only in this case that 'iron' and 'copper' have identical meanings. The terms 'iron' and 'copper', each have three meanings in the Art, apart from their ordinary one. Besides 'the first extract', common to both 'iron' and 'copper', the latter has two other meanings: 'the unflammable oil' and 'the new body'; and so has the former: 'the oil' and 'the garland of victory'.

The reader of this book, says Jildakī, must have by now formed a general idea as to what is meant by similarity and dissimilarity. But as only the principles of the Art, he goes on, and not all the questions of minor importance, have been dealt with in this book, for a complete understanding of all the details one has to consult the numerous books of Jābir.

Verses 5,6. 'The correct weight' is obtained either quantitatively or qualitatively. The quantitative weight is measured by the balance and weights, while the qualitative one is estimated by studying the reactions and the effects. The purpose of weighing is to ensure that, when two or more substances combine, an equilibrium is established among the four natures. The 'sound principle' is nothing but the establishment of this equilibrium, without which no stable compound may be formed. By the aid of a balance two equal weights of the dry and the moist parts are taken, and then the latter is little by little poured upon the former and the mixture is stirred until the dissolution becomes complete. The dissolution of the dry part in the moist part is often referred to by the Sages as powdering. Other methods of powdering in which no moisture is used,

such as grinding between two stones, generate heat injurious to the substance. By 'the air' Khalid means the water of the stone, for they have both the same nature.

The constitution of the compound changes after every operation. The following table shows the relative amounts of natures before and after purification: (1)

	Hotness	Coldness	Moistness	Dryness.
Before.	16	16	32	32
After.	4	16	8	32

In the course of purification 12 parts of hotness combine with 24 parts of moistness, ascending together to the top of the vessel and forming what is known as the 'upper part' of the compound. The remaining 4 parts of hotness and 8 parts of moistness also combine together and form the 'lower part' of the compound. The upper part consists of 36 and the lower of 12 measures of the natures. It is not possible to say anything more about the weights, and the intelligent student of the Art has to find them out by himself, making the best use of the gentle hints of the Sages.

Verses 7,8,9. At the beginning of mixing a mortar and pestle is used for 'powdering and rubbing', and water is added to prevent the generation of heat. But in the later stages of the operation powdering is carried out only by water and fire. "And know that these natures are called 'Ābār', and 'copper' also, because 'Ābār' is the black lead, that is, the fluid moisture, and copper is the dry part which contains the coagulated oil.

Verse 10. The vessel to which Khalid refers is an earthen-pot

1. Jildakī did not arrange his figures in a table, but I have done so to make the point more clear.

and in the course of operation its joints must be sealed in order to prevent the escape of heat.

Verse 11. To set the vessel 'propitiously in the furnace' means, in the first place, that it should be set with the greatest care and compassion which one would expect from an 'intimate friend'. Secondly, it means that it should be set in an 'upright' position.

Verse 12. The period of heating is between 30 and 40 days, equal to 'the time of Moses' stay (upon Sina)'. The comparison of the compound to 'ice' implies that it is white. But in fact the predominant colour at this stage is black, for whiteness appears only after the completion of dissolution. It is evident, therefore, that the attribution of whiteness to the compound at this stage is merely due to the transposition of colours by mistake.

Verses 13,14, 15. By the three successive additions of 'the noble white substances' to the compound is meant three of the four 'marriages'. But the period of 160 days represents the time taken by all the four 'marriages' and not only by three of them. Each 'marriage' takes 40 days and the Sages in general do not favour the reduction of this period.

Verse 16 If the fire is increased 'every day a little more than a sixth' of its size, after six days it will become one 'finger' strong and after 160 days nearly 27 'fingers' strong, which seems incredibly colossal. The explanation is that by 'every day' Khalid meant 'every month', and therefore after 160 days the fire will be nearly as thick as the 'little finger'.

Verse 17. Blackness predominates only at the beginning: after the completion of dissolution whiteness will prevail.

Verse 18. After the completion of dissolution, separation begins, and the water, running away from the fire which has by then become very strong, ascends, accompanied by the tinctures, to the top of the vessel and subsequently descends into the receiver. By 'the souls' Khalid means the soul and the spirit, for these have many qualities in common.

Jildakī does not say anything about the verse 19 of Khalid's poem.

Sheikh: "Dhu'n-Nun Al-Iḥmimi Al-Azdi (may the mercy of Allah the Exalted be on him!) said:
'And when thou hast completed it thrice, fear not that in its action it will be slow' "(1)

Iḥmimi refers, says Jildakī, to the three 'marriages' which follow the first one. At the end of the fourth 'Marriage' (combination), dissolution is complete and after that there is little danger of deviation from the right path.

Sheikh: "King Theodorus said to Ares, 'I would like to know also about putrefaction! Ares said, 'Verily Allah has given thee, O King, wisdom in addition to the rest of thy possessions and thou seest that nothing in the world of things which are born, or anything else which the earth brings forth, has power of being born except first it is gently heated in darkness and moisture before it comes forth. We also, if we were not 'putrefied' in the womb should not exist, for the following reason. The sperm when it falls into the womb mixes with the blood which goes out from the womb in every menstruation, and when the sperm mixes with that blood the woman becomes gently warm until her pregnancy is complete. Now this heat is merely a maturation for the sperm and a coction for it, just as the egg is cocted under the hen, in the warmth and moisture. Hast thou not seen the newborn child, O King, and that which comes forth thereon of moisture, and afterwards that which surrounded it? That moisture it was which 'putrefied' it in the womb, and that liquid is a deadly poison - I have seen men when they find it take it and preserve it to kill their enemies therewith' " (2)

1. Tr. p. 46; Es., Vol. II., p. 255.

2. Tr. p. 46; Es., Vol. II., p.255-6

The two passive natures, namely moistness and dryness, explains Jildakī, provide the material of all things in the world. Yet nothing will come into being unless the two active natures, hotness and coldness, exert their influence and supply the material with form.

'Putrefaction' is indispensable to the generation of all species in the three kingdoms, and without hotness and moistness there will be no putrefaction. The reason why the egg, during its putrefaction, takes only hotness from the hen is that it possesses sufficient quantity of moisture within itself. All other animals on the other hand, provide their embryos with both hotness and moistness. The liquid which flows out of the womb immediately after confinement is undoubtedly a deadly poison, for it is the refuse of food consumed by the foetus.

Sheikh: "The King said, 'And is there a name for this liquid?' He said, 'Yes, it is called Mintin Water' (1) He said, 'And what is the meaning of Mintin?' He said, 'It refers to the moisture which exudes from decaying matter, so it is compared to our compound when this is taken out from the putrefaction. It is a deadly poison'. The King said, 'Verily, Agathodemon was (they were) designedly obscure and desired that he (they) said should not be understood by anyone'. He said, 'I have already told thee, O King, that they pressed into use every thing which moves on the earth as analogy to one thing or another in their Science. Now every creature on the earth if it be not putrefied and corrupted and split up and change from thing to thing and from one nature to another will not come forth and will not grow. Our poison is similar, O King. At the beginning of operation it is a mixture of various things, then it is placed in coction in a light fire and putrefies and changes and goes out from one nature and takes on another nature and becomes finally one nature and one poison. And this putrefaction was figuratively named by Hermes "Gold" and "Silver" and the "Seed of Gold and Silver" and the "Seed of Everything" ' " (2)

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1. الماء النتن : The stinking water.
 2. Tr., p. 46-7, Es., Vol. II., p. 258.

'The sublime, simple waters' which flow over the surface of the earth, explains Jildakī, do not stink - they smell pleasant and have beautiful colours. But 'the compound waters', which are shut in the hollows of the earth or inclosed spaces, undergo a qualitative change and give out a stinking odour due to the lack of breathing and the congestion of their vapours. This stinking odour is injurious to health and affects the heart and the 'soul vessels' of man and a number of animals. When 'the moistures of the earth' transform, as a result of putrefaction, into poisons, they contaminate the air and on reaching the olfactory organ disturb the balance of constitution by polluting 'the soul', i.e., the blood spouting out from the heart'. Vitiating of the black-bile (cold and dry) by these poisonous odours causes cholera, and that of the blood itself, pestilence. That is the reason why the Sages strictly forbade opening of the vessel before it had thoroughly cooled. For, if the vessel is opened while the compound is still a little warm, 'a vaporous wind' will spurt out of it and harm the constitution through the olfactory organ.

Even the sweet waters, Jildakī goes on, after a period of stagnation begin to putrefy and give out stinking odours, particularly when the surrounding earth is dirty and foul. And there is no doubt that the stone contains some dirty earth, for otherwise it would be a natural elixir. It is to remove the impurities of the stone that the Sages subject it to different operations. The water of the stone is 'stinking' (Mintin) and poisonous because of these impurities. To emphasise its stinking odour the Sages have, by way of analogy, given names such as 'the water of manure', 'urine', 'the water of excrement' to the water of the stone.

The result is that ignorant fools, not understanding the real intention of the Sages, often mistake urine, excrement, or similar things, for the stone.

"Stinking waters", Jildakī goes on, are all injurious to human beings, whereas they have no harmful effect on the constitution of certain animals whose nature is 'similar' to these waters. One good example is the deer; it eats the viper without being affected by its poison. The constitution of man is very delicate, and nothing but 'simple waters' with sweet taste and pleasant smell is good for him. But by forming a habit of eating and drinking poisons from childhood one could resist their harmful effects, for 'habit is a second nature'.

The reason why the Sages, in the words of Ares, "pressed into use everything which moves on the earth as analogy to one thing or another in their Science", is that they knew perfectly well that everything on earth is made up of the four natures. The generation of fusible bodies and 'brittle' stones was described before on a number of occasions "in this our book". As to the precious stones, they constitute no exception to the general rule: like every other thing they are made up of the four natures in various proportions. When, for example, hotness and moistness are predominant and there are no impurities in the mine, red ruby is formed. The formation of yellow, white, and other kinds of ruby is due to a gradual decrease in the amount of hotness and moistness compensated by a proportional increase in the amount of coldness and dryness. The amount of impurities is also a determining factor, and the depth of the mine is another. The deeper the mine the better, stronger, and heavier its product.

All animal, vegetable, and mineral species in the course of their development pass through a series of different states before they take on their final form. And putrefaction or coction is indispensable to this development. By putrefaction is actually meant the dissolution of coldness in hotness and of dryness in moistness, for "hotness and moistness are the natures of life, while coldness and dryness are the natures of death".

Sheikh: "Ares said, 'I will speak further to thee, O King, to make thee more certain, and that thou mayest know that no operation is complete except with a putrefaction. Thou mayst know it from thine own self'.

"He said, 'Proceed'. He said, 'Know that if the food which thou eatest putrefies not in the stomach by the warmth and moisture, then the liver sucks away its lightness, then cocts it with another coction until it becomes blood and the body is fed therewith, there can be no sperm and no force. And the sperm, when it falls into the womb, if it were not mixed with the blood which goes out from the woman in every menstruation, like as white sulphur is mixed with red sulphur (of which I have told thee before), and dissolve in it, it would not grow. Then it reaches birth, and just as the child is fed in the womb 9 months in darkness, moisture and heat, this, O King, our compound requires that it should be in putrefaction many days until it is tinctured and there arises from it the seed of gold. And know, O King, that everything putrefies and becomes blood (a black oil) and this yearns for reproduction; in the same way our substance after having been putrefied for many days at a gentle heat becomes blood, and when we see it thus we know that it has reached the stage which we call birth, and thou, O King, art qualified to know that there can be no birth except by putrefaction. Hast thou not considered the waters which are in their places, when they putrefy they give rise to salt and natron and shahira (1) (a black earth), and various vitriols and the like? Similarly he who enters upon our Art must know the minerals requisite therefore, and must take them and mix them and then putrefy them at gentle heat in moisture until there comes out from them the nature hidden in their interior, i.e. their mercuries, and when they are collected together they become one sulphur, as the Sage explained, saying "If thou beginnest and art careful and

1. Cf. p. 272. above.

conductest the operation well in the proper way there will come out from the compound the nature which was concealed therein, and it will become a tincture for thee" '.

"And we have now finished the evidences on the first part of the first operation, and will give those on the second part, if Allah will" (1)

The food people eat, explains Jildakī, is from animal and vegetable kingdoms, only the salt belongs to the mineral kingdom. And everything from animal and vegetable kingdoms, which is consumed as food, must have gradually passed through the stages of maturing and coction. Some of the foods are matured and cooked entirely by nature, like fruits, but in general they require a further cooking before they are consumed.

Jildakī then describes, as he did on several occasions before, the transformation of the food into blood (2) and the mechanism of reproduction.(3) By the 'white sulphur', he says, Ares meant the moist part of the stone, and by the 'red sulphur' the dry part of the stone. He discussed previously⁽⁴⁾ the length of the period of pregnancy in animals, including woman. And now after repeating what he had said before, he enlarges upon the subject by referring to a number of other animals as well as plants and mentioning their period of pregnancy (i.e. maturing: coction: putrefaction).

The duration of pregnancy is seven years for the lioness, one year for the camel and the mare, an average of nine months for woman, six months for the goat and the sheep, four months for the cat and the dog,

1. Tr., p. 47-8; Es., Vol. II., p. 269-70

2. See p. 62 above.

3. See pp. 65-71 above.

4. See p. 113 above.

and from forty to sixty days for the birds. The duration of maturing (the interval between planting and reproduction) of some of the plants is as follows: almond, apricot, peach, pomegranate, one year; palm, olive, walnut, one to four years; cereals, seven months in the Frigid Zone, six months in the Temperate zone, and five months in the Torrid zone. Now the Elixir is also cultivated, like a plant, or reproduced like an animal. The average duration of its reproduction is from six to nine months. But there is also a short duration from four to six months, and a long duration from four to seven years. After the successful conclusion of the first concealed operation, however, it is possible to finish the rest of operations between forty or sixty days. Beyond this, it is not practicable to shorten the duration of the operations, except by the application of the methods of the Balance. The duration of every operation depends on the intensity of the 'two fires' and the weights of the ingredients. In this book, continues Jildakī, the middle road is taken and emphasis is laid upon the average duration. But in 'our book' Al-Taqrīb fī Asrār al-Tarkīb, all the different durations are dealt with satisfactorily, without, however, any reference being made to the substances used in each operation.

Ares says that the compound 'should be in putrefaction many days until it is tinctured', and he means 'until it becomes black'. By the 'seed of gold' he means 'the divine water which bears the spirit', i.e., the moist part of the stone which dissolves and carries withit the tincture. The 'black oil' is a constitutent part of every substance,

it is the 'oily moisture' from which the 'natural heat' originates. And the redness of blood is due to the natural heat, an excessive amount of which produces the 'yellow gall', and, if this excess is accompanied by an increase in dryness, the 'green gall' is produced. The 'Black gall' originates from the dryness which has subdued and prevailed upon the oiliness.

The first child of the Art is the 'tincture', and from that originates the second child, 'the water of life', and from that the third child, 'the garland of victory', and from that the fourth child, 'the Elixir'. But, as Ares said, 'there can be no birth except by putrefaction'.

Stagnant water dissolves part of the earth which surrounds it and forms a solution of salt, natron, shahira (1), vitriol, or other similar substances, according to the locality - this dissolution is a kind of putrefaction.

By 'their mercuries', Ares means the pure essences of the stone, so called because of their volatility and their quality of running away from the fire. By 'one sulphur', he means 'the first compound,' which is oily and black and results from the combination of the dry part with the moist part. The appearance of the black colour is an indication that the operation has been conducted 'in the proper way'. This is the first blackness, it indicates the completion of the 'second calcination', or the 'second combustion', or 'dissolution'. In the first combustion the moist part reduces the dry part to a very fine powder or calx. In

1. شحيرة :ashes of which soap is made; 'a black earth'

the second combustion the moist part dissolves in it the greater part of the 'fine powder', which contains the tincture, and on distillation they travel together to the top of the vessel and then descend into the receiver. That part of the 'fine powder', which remains at the bottom of the vessel after distillation, contains no tincture. The water which is collected in the receiver is referred to as 'the soul, the blood, the spirit of life, the poison, and the divine water'.

VOL II. BOOK II.

CHAPTER I. Explanation of the fifth section of the fourth part of Al-Muktasab, upon evidence concerning the manner of the second part of the first operation, which is the end of the dissolution and the separation.

Sheikh: "Theodorus the King said, 'Expound unto me concerning the Sage where he says that one must put one third of the water into the sea'. He said, 'We are merely ordered that in the first combination we should place in the magnesia onethird of the remaining water, and with that there will arise from it the snows and clouds. Extract from it the juices of those snows, and thou wilt find that one third of the water has passed away in the coction. We call these juices "broths" (compounds) (1) and "Froth of the Nile" 1. " (2)

The first compound, explains Jildakī, is called 'the magnesia', and also 'the black sea', "for matter originates from vapour and smoke", and it is the smoke which is the cause of the blackness of the oily tincture. 'The water', Jildakī goes on, is divided into three equal portions, which are added to the compound in three consecutive stages. By 'one third of the remaining water' is meant the third portion, the second portion

1. Pt.: مرقاات ; Es., مركبات

2. Tr., p. 48; Es., Vol. II., p. 282

being that which is added to 'the sea'. Ares did not explain this clearly because he wanted to mislead the ignorant fools. By 'the snows', he implied whiteness and by 'clouds', the vapour. Of the three portions of 'the water', only the first one fully combines with 'the body of magnesia' (the compound) and is transformed into an oil which is thicker and heavier than 'the water'. And that explains the meaning of the words of Ares that "thou wilt find that one third of the water has passed away in the coction". The 'juice', i.e., the oil, is called 'compound' because it consists of several components, and it is called 'Froth of the Nile' because it appears on top of the compound. The comparison with 'froth' has another significance, it implies that the compound will gradually become blue and the blackness will withdraw into the inner part.

Sheikh: "The King said to Ares, 'Explain to me the Sage's saying, Melt the water of the ash which was originally obtained from white unseasoned wood with (called) (1) urine, and gums and milk, and wash it with vinegar until it undergoes change'. He said, 'the Sage was quite clear, O King, but thou didst not understand that which he said: verily he ordered thee to return the water to it twice until it becomes a thick liquid after it has become dry ashes. Then heat it and when it has become a thick liquid volatilise it in a tube alembic several times'. He said, 'Verily thou hast spoken a speech the like of which I have never heard from thee' He said 'Hast thou understood the saying of the Sage, "Melt the ashes twice"? - he meant thereby only that.' He said, 'Yes'. Ares said, 'Treat the two thirds with the third' " (2)

"Know", explains Jildakī, "that the ash consists of the salt, natron, gily, sharp water, acrid water, sal ammoniac, and water of white and unseasoned wood which constitutes the lower component of the stone and

1. Pt. المسمى بالبول ; Es. بالبول

2. Tr., p. 48 ; Es., Vol. II., p. 284-5

is mainly responsible for the acridity of the water, and that is why the Sage ordered its melting". The water, extracted from the compound in the first distillation is called 'urine', for it is sharp but not oily. The water obtained in the second distillation is called 'gum', for it is sharp and thick. And the water obtained in the third distillation is called 'milk', for it is oily and extremely white. These waters are returned to 'the ash', i.e., the part remaining at the bottom of the vessel after every distillation, melting it and changing its colour from greyish blue to white. And after the addition of the third portion of the water, the compound is volatilised in a tube alembic several times. To 'wash it with vinegar' means to distil it several times, for both operations produced the same result: purify the compound. The Sage said 'Melt the ashes twice', which implies that the melting at this stage is preceded by another melting carried out in the first concealed operation. By 'the two thirds' Ares meant the second and the third portion of the water, and by 'the third', he meant the first portion, that is, the oil.

Here, Jildakī gives a lengthy quotation from K. Nār al-Ḥajar (The Book of the Fire of the Stone) concerning the four principles. The following is a brief account of the quotation in question:-

Jābir: The third principle, i.e., 'the fire of the stone', is of special importance, for virtually it is 'the tincture'. People are mostly ignorant with regard to the manner of its extraction from the stone. The preparation of the tincture forms the 'major part' of the science of the Balance. When first extracted from the stone, the tincture is impure and is mixed with 'the oil' which imparts its red colour to the

mixture; but after the removal of the oil, the tincture appears dark yellow. To separate the tincture from the oil the mixture is dissolved in the 'sharp water'. The best 'sharp water' to be used in this connection is vinegar obtained from grapes. Sal ammoniac and the 'milk of the bat' (1) are added to vinegar in order to increase its power of purification and dissolution. Then three parts of this vinegar are added to one part of the mixture of the oil and the tincture. After 'beating' (2) and shaking the solution strongly, the oil, together with some of the impurities, thickens and coagulates, and may be easily removed, leaving the tincture dissolved in the vinegar. This is like shaking the milk in a skin and separating the butter, or like thickening and coagulating the olive oil by cooking it with 'gily water'. And it is on the basis of the latter similarity that this part of the operation is compared to the production of soap. The vinegar in which the tincture is dissolved and is referred to as the 'virgin milk', is then left to stand in a safe place for three days. At the end of this period the tincture collects on top of the vessel, the residual dirt sinks down to the bottom, and the remaining liquid stands in between. The yellow and pure tincture thus isolated is subsequently removed from the top of the vessel and employed for the purpose of transmutation. The remaining liquid and the residual dirt are thrown away, since no benefit may be derived from them. The tincture is hot and

1. شیرزق Persian. شیرزق

2. ضرب

dry, and that is the reason for its being called 'the fire'. It has an intensely bitter taste and 'expands' with the slightest application of heat, breaking the vessel in which it is contained. This does not imply the departure of its soul; for, if it is subsequently transferred to another vessel, the application of heat would produce the same result. The complete departure of the soul takes place only in the smelting fire. In the preparation of the tincture the skill of the operator is an important factor. There is a difference between the tincture produced by an expert and that prepared by a beginner, similar to the difference which exists between two dishes of the same food made from the same ingredients but by two cooks, one of them experienced and the other a learner. It is within the power of an expert to make alterations in the process of the preparation of the tincture and yet arrive at the same successful result, whereas an ignorant fool is incapable of turning aside from the path shown by the Sages without committing an error.

Jildakī's comments with regard to the quotation from Jābir are as follows:-

The operation described by Jābir is the Major Operation, which only the Sages are capable of carrying out. The tincture may be produced by one of the three operations: the Minor Operation, the Middle Operation, and the Major Operation. As regards the importance of these operations, the first one is compared to the mineral state, the second to the vegetable state, and the third to the animal state. The Major Operation is based on the combination of four substances, namely, the 'eastern mercury' the

'western mercury', and the 'fire of the stone', and the 'earth of the stone'. By the 'eastern mercury' is meant the oil plus the tincture, by the 'western mercury' is implied the 'water of the stone' plus its oil, by the 'fire of the stone' is meant the tincture, and by the 'earth of the stone' is meant the extract of the sediments after their purification and the removal of their blackness. The 'newbody' (or the 'nascent body') is not needed in the Major Operation. The substances employed in the Middle Operation are: the 'eastern mercury' (the 'garland of victory'), the 'western mercury' (the solution of the tincture in the water), and the 'nascent body'. Putrefaction constitutes a lengthy and indispensable part of the middle Operation, and all the component parts of the stone have to be putrefied before they are brought together for combination. In the Major Operation, however, there is no need of putrefying every component individually; they are putrefied together after their combination for a comparatively short time. The reason for this is that the supporters of the Major Operation are of the opinion that the concealed operation is sufficient in itself to purify the different parts of the stone, and, therefore, after the combination of these parts, they do not decompose the compound for further purification: their first combination is their last combination. In the Major Operation the Elixir of Whiteness is produced by the combination of one part of 'the earth' with three parts of the 'western mercury', and the Elixir of Redness, by the combination of one part of the Elixir of Whiteness with six parts of the 'eastern mercury'. Concerning the statement of Jābir that the preparation of the tincture

constitutes the 'major part' of the science of the Balance, Jildakī says that the science of the Balance consists of two parts, 'major' and 'minor'. The 'minor part' deals with the production of gold without the use of the Elixir, that is, by means of the purification of the base metals and the subsequent combination of some of them with others. The 'major part' deals with the preparation of the tincture (or the Elixir) and its projection upon the base metals. Jildakī believes that the tincture tastes bitter before purification but not after it.

Sheikh: "Khalid ibn Yazid said when mentioning the second part of the first work, in the rhyme of dāl:
 'Separate them and set them aside carefully, and divide the excess of the spirit which thou hast prepared,
 Into six portions (three times) (1) in all; that is the aim of the skilful adept
 And powder its body therewith, as carefully as possible, with the New Water;
 Return it thereto cautiously, and heat it and drive it away by sublimation.
 Do this seven times (no less) and thou wilt see as it were tears flowing down the cheeks.
 Sublime it seven times after this with gradually decreasing fires,
 Then remove it and carry out seven distillations like swords drawn forth from their scabbards.
 Now extract from the ashes of the body a calx, by means of violent fires,
 Thou wilt see it with sparkling crystal faces, and shining with the glitter of nitre.
 It is called 'the alum' and 'chalkos', so understand the discourse I have moulded for thee in this ode.
 Democritus called it 'a sword' and Mary the Copt gave it the name of 'The Chains'.
 With it the waters may be dyed, so be wise. Then sublime them with firm resolution' " (2)

1. Does not appear in Es.

2. Tr., pp. 48-9; Es., Vol. II., pp. 299-300

There are on the whole, explains Jildakī, three equal portions of 'the soul' or the moist part which are added to the dry part in the course of the operation. The second portion is divided into three equal parts and added to the compound in the manner described before. (1) The third portion is divided into six equal parts which are successively added to and subsequently extracted by distillation from the compound. The six equal quantities of the moisture obtained in this way are then added together and poured upon the compound (i.e., the earth) and subsequently extracted from it by distillation. This addition and extraction of the moisture is repeated seven times to make sure that no 'spirit' is left in the earth. The moisture 'cuts' the earth into two and separates its 'essence' (the oil plus the tincture) from its impure parts. That is why Khalid compared the moisture to a sword.

The aludel used for sublimation, says Jildakī, has a small hole on top, the size of which is that of the eye of a needle. But, in the course of the extraction of the tincture and its sublimation together with the moisture, this hole must be stopped firmly with a small stick 'wrapped in cotton wool' to prevent the escape of the spirit of the earth. 'The alum', 'chalkos', 'a sword', and 'the chains', all refer to the same thing: the mixture of the oil and the tincture.

Jildakī then quotes the concluding words of K. Zahr al-Riyād (The Book of the Flower of the Garden) of Jābir concerning 'the alum' of the Sages. The following is a brief account of the quotation from Jābir:-

1. See p. 178 above.

Jābir. The formation of 'the alum' takes place in the 'fourth operation', the completion of which marks the end of all difficulties. If one succeeds in avoiding pitfalls up to the end of the fourth operation, one need have no anxiety about the remaining operations. For after the fourth operation the labours of the operation begin to attain fruition. But it must be borne in mind that "the alum of the stone is not the alum of the market". Jābir says that he has mentioned in this book things which are to be found neither in his other books nor in the writings of other Sages. He then goes on to discuss the popular theme of the alchemists: the comparison of a wise man with an ignorant fool.

Jildakī's explanation of the words of Jābir contains nothing of importance.

Sheikh: "And he (Khalid) said also in the rhyme of lām:

'Divide the spirit in thy process of addition of moisture, into six parts, and let it be done with intelligence of a high order.

Then combine with the whole (compound) a sixth of (the spirit) without laziness; nay, rather, pound it long and well.

And let the whole remain in thy vessel with a spout and with a stopper at the top pierced with holes.

Thou wilt see the spirit rise with some of the souls, free from the impurities of the sediments;

Return it after the distillation has ceased, and add another sixth without fail.

Thou wilt see it shine therein on powdering; then pour the water on to it carefully.

And wash the body unweariedly with fire and with a water which is a deadly poison.

Next, sublime seven times without intermission, and thou wilt find therein inexhaustible fortune.

Take from the sediment an ash in colour like salt (snow); it is called "The charcoal of the Mountains."

Thou wilt see it as though it were a flower in the midst of a meadow or virgin gold (sulphur) gleaming among pearls.

It is called borax and soda; it strengthens the tincture and renders a second tincturing unnecessary.

Fertilise the soul with this, if thou hast understood, then do not neglect to sublime it.

Sublime the soul seven times in all, after this, with
discretion,
When thou wilt see it as lightning flashing, or pure gold
washed free from all dross.
If thou hast understood, its weight will be nine parts, as
said the Lord of Princes'

End of the evidences on both parts of the first operation, Praise
be to Allah" (1)

Khalid, says Jildakī, refers in the above poem to the division of
the third portion of the moisture into six parts and the successive
addition of these to the dry part, as mentioned before. The 'Lord of
Princes' is 'Alī ibn abī Tālib.

VOL. II., BOOK II.,

CHAPTER II: Explanation of the first section of the fifth part of
Al-Muktasab, upon evidence concerning the first part of the second opera-
tion.

Sheikh: "Ares said to King Theodorus, 'Take one part of the ashes and
preserve it carefully, for it is the Crown of Victory'. After-
wards he said, 'When thou mixest the prepared water, which is
the mercury of Qanbār, with the red sulphur, place a small portion
of those ashes with them as leaven'
(He called the new body 'red sulphur' and said 'a small portion
of the ashes' after saying 'one part')" (2)

In the above passage, explains Jildakī, Ares speaks of three things:
'the ashes, the water, and the red sulphur". By 'the ashes' he means, as
he himself points out, the 'Crown of Victory (or the 'Garland of Victory'),
the properties of which were described on several occasions before. When
'the ashes' are being heated the joints of the vessel must not be sealed
until all the moisture has evaporated, for otherwise the vessel may break.

1. Tr., p. 49; Es., Vol. II., pp. 305-6

2. Tr., p. 50; Es., Vol. II., p. 307

Moreover, the intensity of fire should be increased only gradually, starting with hot ashes and passing on to "charcoal fire, then cane fire, then tender-wood fire, then strong-wood fire, then thin-timber fire, and finally thick-timber fire on the seventh day. And do not open the vessel before it thoroughly cools down".

The relation of 'the ashes' to the two other substances, namely, the 'red sulphur' and 'the water' is that of leaven to dough. And when 'the water' is mixed with 'red sulphur', the amount of leaven (i.e., 'the ashes') used is between $1/12$ and $1/4$ of the dough (i.e., the mixture). An experienced operator would easily find the actual amount of the leaven required in the course of the operation. In general, a smaller amount of leaven and a longer duration of operation is preferable to a larger amount and a shorter duration.

The properties of 'the water' continues Jildakī, were described before. As to the 'red sulphur' (or the 'new body'), it is a fusible and stable substance with purple colour, which is produced by the combination of the fire of the stone with its earth.

Sheikh: "Hermes Budashir Ibn Aris said to Amnuthasia (Euthasia) 'Take some of the golden stone or rolled talc', and then said 'Take of the poison half the weight of the talc,' thus calling the ashes 'poison'"(1)

Hermes Budashir, b. Ardabish, says Jildakī, was an excellent Persian philosopher and a contemporary of Zosimus. He was the teacher of the philosophers of his days and one of the forty Hermeses, who were so called

1. Tr., p. 50; Es., Vol. II. p. 309

because they derived their knowledge from Hermes the Great. By 'the golden stone or rolled talc', Hermes meant, according to Jildakī, 'the new body or the holy land', to which reference was made in connection with the Major Operation. The adjective 'rolled' implies that the substance has been putrefied, decomposed and softened. The weight of the 'poison' need not necessarily be half the weight of the talc, for, as mentioned before, 'poison' acts as a leaven and the precise amount of it to be used is something for the Sage to decide, according as he favours a quick operation or a slow one.

Sheikh: "Matthew said to Marconis, 'Take of the talc of the philosophers the weight which you know', and he concealed the weight, which others declare to be one part, 'and add to it three parts of the water which has been separated; and then add one part of the leaven which you know', - he meant the ashes or 'poison' and made the weight of the leaven equal to the weight of the body"(1)

The Sages, explains Jildakī, gave the name 'talc' to five things:

1. The 'dry essence' which after the extraction of the moisture from it by distillation becomes extremely white. It is 'the first body' and is referred to as 'the male' on account of the presence of 'the tinctorial spirit' in it. And it is called 'the embryo' because its masculinity is not complete. It is also called 'the rock', 'the fire', 'the copper', and 'the 'ābār of copper' (2) ., 2. "The completely pure, whitened earth used in the Major Operation". 3., The 'Crown of Victory'. 4., The 'new body'. 5., "The whitened body to which the tincture is added."

1. Tr., p. 50; Es., Vol. II., pp. 310-11

2. See p. 324 above.

The Sages, Jildakī goes on, are in the habit of giving different names to the same thing or calling different things by the same name. But a learned man would always be able to understand the true meaning of their words; for they give sufficient hints to enable him to do so. For example, though they call the five substances mentioned above by the name 'talc', yet usually when they want to refer to one particular talc, they add to this term an adjective denoting the quality by which it is distinguished from others. Thus, they speak of 'calcined talc', 'dissolved talc', 'rolled talc', 'brackish talc', and 'golden talc'. By the 'calcined talc' they mean "the dry part of the stone, which has been calcined and whitened by the water and fire". By the 'dissolved talc' they mean "the whitened earth which is also called the holy earth or the pure earth". The name 'dissolved talc' refers also to "the liquid compound, that is, the Elixir of Whiteness before coagulation". The 'rolled talc' refers either to 'the crown', which is very similar to silver filings, or 'the new body' which is raw and immature. "As to the brackish talc, it is mainly used in the Major Operation, but it is possible to employ it in all operations of the Art, provided that it is prepared properly." But what is the proper method of preparing the 'brackish talc'? To answer this question Jildakī quotes a passage from Jābir.

Jābir: "Take a large amount of mountain sand and boil it in a cauldron with water until 1/3 of it goes. Then take the vessel down and transfer its contents to a retort containing water, and heat it with a gentle fire until all the water evaporates and there remains at the bottom of the retort

a substance like gily. Increase the intensity of the fire for a while and then let the vessel cool down. Then take it out and pound it and place it in an earthen pot and heat it with a violent fire until you see the vessel tarnished, so cease the fire and take the contents out, you will find it molten. Pound it well and place it in a glass vessel and pour upon every one part of it three parts of distilled water and stir it and leave it to stand for three days. Then filter it carefully and throw the black sediment away, for it is useless. Take the filtered solution and heat it with a gentle fire, the water evaporates and the salt, resembling the snow, remains. Put it in a flask, placed in a pot containing ashes, and heat it for a day with a violent fire of wood. Then take it out of the vessel you will find it a molten salt, extremely white like crystal glass. And this is the brackish talc employed in the operation."

Jildakī enlarges upon the words of Jābir by explaining the cause of combustion and the reason for the use of a gentle fire. "The cause of combustion of the particles of the stone", he says, "is the inflammable oil which it contains. The combustion of the healthy parts, therefore, is made possible by the corrupt parts". That is why, he goes on, a gentle fire is in many instances preferred by the Sages to a violent one. For, in the first place, if the intensity of fire is increased to such an extent that the combustible parts of the stone start burning, the healthy parts, that is, the parts which we intend to isolate, would also be destroyed by the heat. In the second place, a violent fire, if kept undiminished for a long time, would impair the chances of the unification

of the moisture with the earth. To unite the moisture with the earth, the uninflamable oil of the earth has to be extracted, leaving the 'blackness of the oil', which is the actual cause of combustion, with the remaining parts of the earth. Then, the remaining parts of the earth which include the 'blackness of the oil' are treated with the moisture, as a result of which the 'blackness' is removed, and after a number of operations, such as solution and coagulation, a white, stable and easily fusible substance 'of the rank of silver' is formed. The earth thus prepared is indispensable to the success of the Art, and as it is very much like silver, the Sages sometimes take the latter, and, after subjecting it to special processes, use it in place of 'the earth'. In this connection Jildakī quotes a poem from Al-Ṭuḡrāī and several verses from Abū al-Aṣba' b. Tamām.

Sheikh: "Matthew said in his most important Epistle, 'Divide the water into 9 parts, and take one third thereof, that is three parts, and add it to the golden talc of the philosophers. Let the weight of this talc be one third of the weight of the water'. And he said concerning the burnt ashes which have become spiritual, '(The third of the talc, i.e.) (1) The third of a third will suffice you', and he called the new body 'golden talc'⁽²⁾"

Some of the Sages, explains Jildakī, favoured the division of 'the water' into ten parts, but the majority of them, like Matthew, preferred to divide it into nine parts. By the 'burnt ashes' Matthew meant the 'Crown'. And as to the weight of the ashes, though most of the Sages say that it should be a third of that of the talc, yet, as mentioned before,

1. Does not appear in Pt.

2. Tr., p. 50; Es., Vol. II. p.316.

there are those who in order to increase the speed of coagulation, use a larger amount, say, one-half of that of the talc. But if equal weights of the talc and the water are used, 'the spirit' would dominate over 'the body', and the latter would be in no position to give protection to the former. This would produce a very strong and volatile elixir, the preparation of which requires plenty of experience.

Here Jildakī quotes four verses from Khalid concerning the extraction of the oil from the stone, and the tincture from the oil. Neither the verses of Khalid nor Jildakī's explanation with regard to them tell us anything not mentioned before.

Sheikh: "Hermes said in his Epistle known as 'The War of the Egyptian Stars', 'The fundamental luminous portion, which is its basis, and one of the earth'. He makes the white body and the ashes here, one, and one in the new body.

"Mary the Copt said concerning the return of the water upon the substance, 'Make it enter a body other than its own body, and it will become stable'. This was mentioned also by Jabir Ibn, Hayyan. The Sufi in the Book of Exchanges (1) (one of the 500), where he says, 'And this body is not a strange one, nay, but it is the very body which was dissolved and from which the sulphureity has been extracted, leaving it as ashes; it is therefore different from it in quantity but not in species. Rather is it a derived form of the first in reality'.

"Mary hinted at this, for after saying, 'Make it enter a body other than its own body, and it will become stable', she said, 'The soul indeed is quick to return into its own body, but if thou desirest to make it enter a body differing from its own, it will not do so'. Now this appears to mean 'differing in their prime matters' but in meaning it is consistent, for the second body is derived from the first and is not a strange body, but is that very one from which the spirits have been extracted. It is, indeed, the soul's body in essence and in species, although it is not the same body from which the soul went out.

"Understanding this explanation, therefore, and stand firm thereby, for it is one of the most important things of this Science" (2)

1. K. al-Abdāl.

2. Tr., p. 50-1; Es., Vol. II., pp. 320-21.

We are here concerned, explains Jildakī, with the principal operation of the Art. And though the Sages are at variance with one another as to the best method of performing this operation, nevertheless they all arrive at the same conclusion. Their difference of opinion, therefore, is not destructive. On the contrary, it is constructive; for from it originate the different kinds of approach for achieving the same end in the Art.

By the 'fundamental luminous portion', Hermes meant, according to Jildakī, the 'brackish talc', of which mention was made before. By 'one of the earth', he meant 'part of the earth', to be more accurate, the 'volatile part of the earth' or the 'leaven'.

To interpret the words of Mary the Copt and Jābir, Jildakī quotes a poem from Ṭuḡrā'ī and two passages from The Epistle of Barhamī; neither these nor the lengthy comments advanced by himself throw much light on the subject. Here is the essence of all that Jildakī had to say with regard to the words of Mary and Jābir, contained in the last quoted excerpt from Al-Muktasab:

'The water', which is returned 'upon the substance' is the soul. (1)
And 'the substance' or 'the second body', though not identical with 'the first body', that is, the stone or the body 'from which sulphureity has been extracted', is similar to it, for they are both of the same species

1. Throughout this dissertation I have invariably translated 'ruh' as 'soul' and 'nafs' as 'spirit'. There is no hard and fast distinction between these two terms in Arabic, and I doubt if there is any tangible difference between their equivalents in English. Holmyard in his translation of Al-Muktasab took 'ruh' to mean 'spirit', and 'nafs', 'soul'. For Jildakī, however, 'ruh' and 'nafs' are always distinguishable from one another.

and originate from vapour and smoke.

'Soul' and 'spirit', Jildakī goes on, are heavenly entities. 'Soul' according to the Sages, is a hot and moist liquid. And when its hotness is replaced by coldness, it takes up the nature and the form of water. As to the 'spirit', it is hot and dry like fire. 'Spirit' is 'the material of action' (1), while fire is 'the active essence' (2) of all things. Judging by its action, the 'spirit' is hot, dry, and uninflamable, though it helps combustion and transformation. But 'in its essence', the 'spirit' is hot and moist, for it contains 'oily moisture'. And when the soul combines with the spirit, the resulting compound acquires the nature of life, that is, it exhibits the qualities of hotness and moistness.

Sheikh: "Ares revealed it to Caesar, saying 'As for me, O King, I will strike out a parable for thee concerning our sea and our airy water - if thou takest a young plant from its place in the earth and plantest it in another soil, it will take root if there be a resemblance of the two soils, but if thou plantest it in a soil which differs from its own, it will not grow'. May Allah sanctify the soul of this Sage!" (3)

By 'our sea' Ares meant, according to Jildakī, "the sea of philosophy from which vapour and air arise". To this sea, says Jildakī, Ṭuḡrā'ī referred in his couplet:

"When the salt is mixed with the water of the sea,
A soap is formed for this affair"

What Ares actually wanted to convey by his parable of a young plant was that "the first combination is the result of extraction' and separation

1. مادة الفعل

2. جوهر الفاعل

3. Tr., P. 51; Es., Vol. II. p. 332

of an essence which has to be settled in a body differing from the first body but of the same species".

Sheikh: "The author of the Shudhur said in the rhyme of dhāl:

'Let it return to the body, the untreated parts of which
are unscorched at the beginning. (1)
Its untreated parts, after they have become broken up, are
matured by the heat of the reiterated roastings therewith,
And the eye of the body becomes free from the blemishing mote
when there is no mote in the eye of the soul' " (2)

Here, once again, Jildakī refers the reader to his book Ġāyat al-Surūr for a complete understanding of the poems of Ṣāhib al-Ṣudūr. He, nevertheless, goes on to explain 'briefly' the three verses of Ṣāhib quoted above. He says that the use of the term 'return' by Ṣāhib implies that there has been a separation and, before that, a combination. There is, he argues, another significance in the use of the term 'return'. For it implies that the 'isolated essence' is later combined with the same body from which it was extracted. This takes place only in the Major Operation. In the Middle Operation, which is favoured by the Sheikh, the 'isolated essence' of the first body is later combined with another body, different from the first, yet of the same species.

The main difficulty with the 'second combination' is that the Sages described it in such a way as to make it impossible for anyone save a learned man to understand their true intentions. However, if in spite of all explanations of Jildakī, one fails to understand the meaning of the words of the Sages, the best thing for him to do is to give up the pursuit

1. This verse does not appear in Pt.

2. Tr., p. 51; Es., Vol. II., p. 333.

of the Art, "for next to our explanation, is complete divulgence".

Sheikh: "Khalid Ibn Yazid (may Allah have mercy on him!) says in the rhyme of dāl:

'Take, so mayest thou prosper, one part of copper and half
a part (and know that it is a powder),
And one third of (three times) its weight of the purest part
of the soul which has been sublimed away from its fetters;
Mix them carefully and cautiously by means of a fire from
which they cannot escape,
And without doubt (fire) blackness will appear: on further
heating the substances goes still blacker.
Let it remain enclosed for a time equal to that appointed
for Moses, (for ninety days), and congealment will wrap it
in a mantle.
Thou wilt see it as though it were white marble, and ice too
it resembles.
Then increase its fire until thou seest it resemble earth
mixed with gypsum.
That is their prey, if thou hast understood, and their tincture,
the fish which they have hunted' " (1)

The weight of the soul, explains Jildakī, is three times that of the copper. And the copper is 'the ashes' or 'the crown' to which reference was made before. 'The crown', we remember, acted as a leaven and its weight was determined by the speed of operation. The blackness which appears in the second operation is not caused by the presence of impurities and dirt in the compound, it results from concentration of the purple colour of the Elixir. After the complete coagulation of the different components of the compound, the blackness withdraws and becomes hidden, while the whiteness comes to the surface. Concerning the period of ninety days suggested by Khalid, Jildakī says that he would deal with it on another occasion.

Sheikh: "He (Khalid) said also in the rhyme of lām:

'Take nine parts of new copper and a third as much of the sand,
 And of the oil as much as a third of thy water, so understand the secret of science which I have explained to thee in my speech,
 Moisten it with the water and then let it be fertilised with gypsum; its colour will appear therein on solution,
 Let it be fostered by the fire for a month, another month and still another, in full and unweariedly,
 Blackness will come over it, then after a month and a third it will purify by separation.
 And Whiteness will make its appearance, announcing crystallisation, and destroying the garment of the humble.
 Thou wilt see it like marble in its whiteness, brilliant in colour and bright as the new moon.
 Increase the fire to break its crust and it will be left like a sandy earth' " (1)

The references of Khalid to the weights, in the above poem, are obscure, says Jildakī. 'The new copper' of which nine parts are taken is 'the divine water', that is, the unflammable oil dissolved in the water. 'The divine water' resembles the copper in tinctorial power and oiliness. By 'the sand' Khalid meant 'the ashes' or 'the crown', the weight of which should be one-third that of "the copper, that is, the talc and not the water" "And of the oil as much as a third of thy water", said Khalid, and by 'the oil' he meant 'the new body', for the latter melts like wax and the Sages unanimously agree that its weight should be one-third that of the water. By 'its colour' in the third verse is implied the blackness of 'the body', and by 'gypsum' is meant the substance produced by moistening 'the body' with 'the water' and then adding to

1. Tr., P. 52; Es., Vol. II., p. 339

them 'the ashes'. The period of 'fostering', as mentioned in the fourth verse, is three months, that is, ninety days. The black colour will persist, as mentioned in the fifth verse, for a month and a third, that is, forty days, at the end of which it is superseded by whiteness, and thus the production of the Elixir of Whiteness becomes complete.

Here, Jildakī quotes several poems from Ṣāhib concerning the production of the Elixir of Whiteness. For the complete understanding of the meaning of these poems, Jildakī again refers the reader to his book Ġāyat al-Surūr. He praises Ṣāhib al-Ṣudūr and says that he attained eminence in all branches of philosophy, was an eloquent poet with an excellent style and a large vocabulary, and employed allegories and parables extensively.

VOL. II. BOOK. II.,

CHAPTER III.: Explanation of the second section of the fifth part of Al-Muktasab, upon evidence concerning the second part of the second operation.

Sheikh: "Khalid said to Marianus, 'Tell me of the second remedy (meaning the second part of the second operation), is that like the first operation (meaning the second part of the first operation)'? He said, 'Yes. When thou hast finished the cure of this body, add to it one fourth part of the leaven. And know that the leaven of gold is gold, and that the leaven of bread is therefrom, and there can be no rectifying except by means thereof. Place this fourth part of the leaven with the leaven of gold, and add as much leaven of leaven as is suitable for it and set it to mature in the sun until it becomes homogeneous and a single body. Then begin the ablution, after having sought the blessing of Allah and His aid; pour on the substance some of the poison and mature it therewith three days, and take care not to diminish the time even by a little, and be not unmindful of the fire, that it become not too violent and destroy thy cauldron, for then thou wouldst grieve over that which was therein.

" 'Then return to thy cauldron after seven days, and if the portion of liquid thou hast added be drunk up, moisten the substance with a portion of white of egg and increase the strength of the fire a little until this be absorbed. If it get(s) dry, moisten it with pure water as thou didst at first,

and continue this moistening and heating until it has taken up all the remaining water and nothing thereof is left. Then will appear the blossoms and the colours will change and the Elixir will clothe itself in the raiment of Kings and make thy labours sweet. It is stable even in great heat for a period of 21 days. All this is found in the books of the Sages, therefore seek, and ye shall find it explained and expounded and made clear' " (1)

Jildakī begins his explanation here by saying that although the Sages may differ from one another as to the method of carrying out and the duration of each operation, they never deviate from the scientific and philosophical laws.

Marianus, Jildakī goes on, spoke of 'the cure' of the body, that is, he regarded the production of the Elixir as the cure of the stone. And indeed every operation in the Art may be considered as a kind of remedy, and in this respect the second operation is similar to the first. A strange thing in the Art is that when the male and female combine, they form a single homogeneous body, which gives birth to three children, one after another. The practitioner of the Art treats these children and their unified parents, just as a physician treats a patient. The first child is a soul, the second a spirit, and the third a body which originates from the combination of the 'pure body' with 'cured body'. By feeding upon the first and second children, which have been combined and transformed into an easily swallowable milk, the third child grows and becomes white after it has been black. It later becomes, as a result of further treatment, red, lively and stable. So from the beginning to the end every operation

1. Tr. pp. 52-3; Es., Vol. II., pp. 345-6

in the Art may be considered as a kind of treatment.

By 'this body', continues Jildakī, Marianus meant either of two things: 'the reconciliator' (1) and the Elixir of Whiteness.

'The reconciliator' is the red sulphur, it is soft like wax and melts easily when dropped on a hot plate. Like the Elixir of Redness it has a purple colour and is fusible, penetrating, capable of combination, tinctorial, stable and perfective. But it is much less tinctorial and perfective than the Elixir of Redness, and to attain to the status of the latter, its soul and spirit have to be 'expanded'. If 14 qīrāts of it are added to 10 qīrāts of silver and the mixture is melted in the smelting-fire, the resulting compound will be real gold. The red sulphur, in fact, excels the Elixir of Redness in resisting the smelting-fire: the latter disintegrates in that fire because of its excessive spirituality. The red sulphur excels gold in tincture, spirituality and easy fusibility. It is a product of the Art, though its prime matter exists in the world. To produce the red sulphur its raw material is pounded well and, after being mixed with 'the oils of the Art', is subjected to ceration; "we are not allowed to say anything more in this connection".

But, as mentioned, by 'this body' Marianus might have meant the Elixir of Whiteness, which is colder, dryer and less spiritual than the Elixir of Redness, but excels silver in spirituality. 'The leaven' of which one fourth part is taken is the 'raw body', and 'the leaven of the leaven' is 'generic sal ammoniac'. 'The leaven of gold' is either of two things: 'the new body' or 'the red sulphur', and 'the unflammable oil' or 'the copper'.

The Elixir of Whiteness does not transform to the Elixir of Redness at the end of the second operation. It requires a third operation, which the Sages keep secret. Marianus included the third operation in the second. The 'conciliator' used in the preparation of the Elixir of Whiteness is either 'the white body' or 'the red body', i.e., 'the white earth' or 'the red earth'. And it is possible to produce the Elixir of Whiteness with or without leaven. Now, if the 'conciliator' used in the preparation of the Elixir of Whiteness were the white body (i.e., the white earth), we should require the leaven of gold (i.e., the red uninfalmmable oil) and the leaven of leaven (i.e., the generic sal ammoniac) for the production of the Elixir of Redness. Therefore, in the third operation, one fourth part of the leaven, one part of the leaven of gold, and one part of the Elixir of Whiteness are combined, and the mixture is cerated and moistened with six times its weight of the divine water until the Elixir of Redness appears. But if the 'reconciliator' used in the preparation of the Elixir of Whiteness were the red body (i.e., the red earth), the Elixir of Redness would be formed by moistening only, though the addition of one fourth part of the leaven and one part of the leaven of gold would increase the speed of transformation. Jildakī says that for a complete understanding of the third operation the reader must refer to his book Al-Taḡrīb fī Asrār al-Tarkīb (Approximation in the Secrets of Combination). He adds that in order to avoid mistakes in the third operation it is better to use one fourth part of the leaven and one part of the leaven of gold, whatever the 'conciliator' employed in the preparation of the Elixir of Whiteness.

The three substances, namely, the leaven, the leaven of gold and the Elixir of Whiteness, combine and become a single body, with the help of the gentle heat of the sun and a small amount of moisture and by pounding and ceration. The leaven of gold and the Elixir of Whiteness yield completely to ceration, but sal ammoniac could only be cerated in conjunction with the other two and by the aid of a little moisture.

The new body, Jildakī goes on, upon the preparation and application of which the Sheikh based his book, is the red body. When it is projected upon silver, it blackens the latter completely, but after successive treatment in the smelting fire the black colour vanishes and pure gold is produced. This amounts to saying that the new body is either the same as the Elixir of Redness, or acts similarly to it. But the difficulty is, as always, that other descriptions of the new body given by the Sheikh or Jildakī do not conform with the one just referred to.

By 'ablution', continues Jildakī, Marianus meant the addition of moisture to dryness. He called the moisture 'poison', because of its power of penetration. The fire employed at this stage of the operation is the same as the fire of putrefaction. "And I declare that the intensity of the fire of putrefaction is such that not more than half the vessel sweats".

"Then return to thy cauldron after seven days", said Marianus, and by that he implied that the period of maturing is from three to seven days. By 'A portion of white of egg' he meant the second portion of moisture, and by 'pure water' the third and the last portion. "Then will appear the blossoms", he said, and he meant that after the third 'red moistening' (1)

1. *Jildakī* does not say anything about the first and second 'red moistening'. See p. 410 below.

the colours begin to emerge. The 'colours will change', he said, and this takes place after the completion of the fourth and fifth moistening. And "the Elixir will clothe itself in the raiment of kings", said Marianus, and by this metaphor he referred to the completion of the sixth moistening. After the effectuation of its production, the Elixir is left for 21 days to coagulate.

Sheikh: "Khalid said, 'Is the operation now finished, or does anything still remain of which thou hast not told me?' He (1) said, 'It is finished for him who likes brevity, but as for him who wishes to continue, let him moisten the substance with Everlasting Water which he has already prepared, and it will increase in tinctorial power endlessly, (and will absorb all the liquid with which he moistens it, to infinity)' (2). Khalid marvelled at this" (3)

The meaning of this quotation is quite clear, says Jildakī. And there are ten advantages in the continuation of the operation after the production of the Elixir:

1., There are certain substances which, when added to fusible bodies in the smelting fire, change some of their qualities. Some of these substances are: boraces, which facilitate fusion and combination; vitriols, verdigris and sal ammoniac, which improve the fineness of imperfect gold; 'prepared verdigris', which improves the firmness of silver and helps it to absorb the tincture; 'lead reduced by arsenic after its whitening and fixation' (4) and white, fixed sulphur, which whitens the copper and softens the iron; white sulphur, which purifies, coagulates and strengthens the tin; pure, red sulphur, which reddens the pure black lead; and coagulated, fixed mercury, which combines with silver and tinctures the pure copper. The

1. Marianus. 2. The part between parentheses does not appear in Es.

3. Tr., p. 53: Es., Vol. II., p. 358.

4. الرصاص المستنزل من الزرنيخ بعد تبييضه و تثبيته

reason why these substances modify the qualities of the fusible bodies in the smelting fire is that both the former and the latter contain soul and spirit which are capable of fusion and combination. And when the soul and spirit of one of the above-mentioned substances fuse and combine with the soul and spirit of a fusible body congruous to it, the constitution of the latter undergoes changes in accordance with the properties of the soul and spirit of the substance. For example, the fusible body becomes white if the spirit of the substance added to it were white, and it becomes red if the spirit were red. Now, Jildakī argues, if ordinary substances like those mentioned above are capable of producing such changes in the constitution of fusible bodies, the Elixir, since it is more spiritual and penetrating than any other substance, on being projected upon those bodies, would no doubt create in them alterations of a more fundamental nature.

2., If the Elixir is fed upon the divine water, it will grow in quantity and improve in quality.

3., When the Elixir is added to pure mercury, it will transform the latter into itself. But this would only happen, says Jildakī, if the operation is performed "in the manner which we will mention in the chapter on the projection of the Elixir".

4., If 'the water' and 'the oil' could be united, after they have been purified, no matter by which method purification is carried out, the resulting compound would be capable of superseding the divine water and increasing the tinctorial power of the Elixir.

5., It is possible to treat the hot prime matter with moisture in such a way that 'separation' takes place in the least possible time and a

divine water is produced which is, at least partly, tinctorial and the Elixir may be fed upon it.

6., If a certain amount of generic sal ammoniac or 'the red golden body' or a mixture of the two is added to the Elixir and all of them are then moistened with the divine water, the rate of growth of the Elixir will increase.

7., If the production of the Elixir is carried out up to the beginning of the second combination and a certain amount of perfect Elixir is then added to the compound, it will act as a leaven and increase the speed of transformation.

8., If a certain amount of generic sal ammoniac is added to liquid Elixir, coagulation ensues.

9., The Elixir of Whiteness will transform in no time into the Elixir of Redness, if it is first mixed with the latter and then moistened with 'the blood of vipers' or 'the essence of tincture'.

10., It is possible to isolate the tincture first and then dissolve it in the water instead of producing it in the form of a solution right from the beginning. In fact, the Elixir will grow and improve faster, if it is moistened with the divine water prepared in this manner.

In short, continues Jildakī, all 'the pure essences' congruous to the nature of the Elixir, when added to it, cause it to grow and become more powerful: it could be repeated indefinitely. For the Elixir is like a leaven, and if a Sage could obtain 'pure natures' and mix the moist ones among them with the dry ones, he would be able to transform 10 parts of this mixture into the Elixir by the addition of a single part of the latter.

And this is what the Sages meant by reproduction of the Elixir. The Sages said also 'that whenever the Elixir dissolves and then coagulates, it will increase in tinctorial power'. Very few people understand the actual significance of these words, comments Jildakī. The Elixir, he explains, dissolves only in the divine water, and its coagulation is carried out by the application of a gentle fire until it becomes dry, whereupon the intensity of fire is increased to complete the clotting and then melt the compound, which is subsequently left to solidify. Jildakī points out that his remarks concerning the advantages gained in continuing the operation after the completion of the production of the Elixir must be fully understood; for only in the most important books of the Sages can similar assertions be found. He cautions the reader, as he often does, not to disclose anything to those who are not worthy of the Art. And he then goes on to quote from Jābir's Šarḥ K. Al-Rahma (Commentary on the Book of Mercy) a rather long passage^a, of which the following is a summary.

Jābir: Some of the Sages are content with the smallest amount of tincture and go no further after the completion of the production of the Elixir. Others are more ambitious and constantly try to increase the amount and improve the quality of their Elixir. The weak kind of the Elixir is called External, and the strong one Internal.⁽¹⁾ One part of the Internal Elixir tinctures 1200000 parts. But this depends on the right preparation of the leaven, "and we have spoken about the leavens in many of our books, this and others" According to the Sages, leaven is 'the body of the Elixir',⁽²⁾ which, when projected upon 'the pure principles',⁽³⁾

1. See note (1) p. 274 above.

2. جزم الاكسیر

3. اركان الطاهر

makes them perfect in no time. It takes the dough less time to mature with the leaven than without it. For a better understanding of the function of the leaven, the reader must refer to 'our book on leavens'.

It is said, Jābir goes on, that in the Art the Sages dissolve the bodies and coagulate the souls. The ignorant fools take this assertion at its face value and try to achieve their ends by ordinary dissolution and coagulation. The right thing to do is to 'soften' the bodies and then 'enter' the souls into them: this is 'natural dissolution and coagulation'. Those who are incapable of understanding the true intentions of the Sages, in their attempt to coagulate the souls, 'kill' them and reduce them to dusts, ashes, calces and the like, by destroying their moisture in the fire. They are like the man who mutilated his slave in order to prevent his escape. Those also who 'soften' the bodies and then try to enter incongruous souls into them are not successful. Bodies must be combined with their own souls, and souls with their own bodies. The actual meaning of this is that the soul and the body must have a liking for one another and possess a certain amount of the 'oily moisture' which makes them capable of combination. Among the mineral bodies diamond,
(1)
ruby, and other gems hardly enter into combination, because they are crystallized in the mines by the 'simple water' which is devoid of oiliness. But metallic bodies like gold, silver, copper, lead and iron, which contain 'oily moisture' show strong aptitude for combination. The same thing may be said about the souls. Not all the mineral souls are capable of combination, only those which contain 'oily moisture' may be settled in

1. باقوت : also jacinth.

the bodies which are congruous to them. Moreover, it must be pointed out that not every kind of 'oiliness' helps combination: the 'oiliness' which originates from sulphur and arsenic supports combination and is tinctorial, whereas that which is derived from sal ammoniac and camphor exhibits no such properties.

Again, many people, continues Jābir, dissolve the bodies and coagulate the souls congruous to them and yet do not arrive at a successful conclusion, the reason being that they pay little attention to purification, the relative weights of bodies and souls in combination, and the problem of bringing the souls and bodies as near (1) to one another as possible before they are united. Without proper purification of the body and the soul, no effective combination of them would be possible. The properties of a compound are half-way between those of its constituent substances. A compound, for example, which is formed by the combination of a body and a soul is lighter and less fire resisting than the former, and heavier and more stable in the fire than the latter. Another example is 'isfidariyya, (2) the properties of which are a mean between those of its constituents, namely, 'the brave copper' and 'the despised lead'. The properties of constituent substances are reflected in the compound in accordance with their weights. And as to the problem of bringing the body and soul nearer to one another before combination, this could be achieved by treating the former with sal ammoniac and mercury, and the latter with salts, vitriols, and sharp waters. It is possible to bring substances nearer to one another

1. تاليف

2. اسفدرية (اسفداج : ceruse) See p. 363 above.

and make them to exhibit similar properties, because all things have a common origin and are composed of the four natures. There are groups of substances which have a nearer common progenitor than the four natures. The seven fusible bodies, for example, originate from sulphur and mercury and to the extent that each one of them is composed of these two essences, it exhibits the properties of that essence. So it is with sulphur and mercury themselves: they are partly earthy, partly watery, partly fiery, and partly airy.

Jildakī, commenting on the passage from Jābir, says that the mercury, sulphur and arsenic to which the latter refers are not the ordinary substances bearing those denominations: they are the mercury, sulphur and arsenic of the philosophers. He adds that Jābir described the principles of philosophy in his Šarḥ K. al-Rahma in a very obscure manner; and as to his other books they contain cryptic assertions which only a few could understand. The most important books of Jābir are, according to Jildakī, The 500 Books, The 112 Books, The Book of Seventy and The Book of Properties.

Sheikh; "Theodorus said to Marconis The King and Matthew when they were assembled together with him and he was asking them about the second part of the second operation, 'Tell me what happens to this body after its conjunction with its spirit and soul'. One said, 'Thou makest one portion of its soul and its spirit to enter it'. He said, 'By powdering it or without?' He replied, after a long speech, 'Without powdering it. Then it is set aside to dissolve'. He said, 'And how long does the dissolution take?' The period of dissolution is one day! 'And when it is dissolved what is done with it?' He said, 'It is thickened in the fire', and then went on explaining to the end of the operation". (1)

By 'this body' Theodorus meant, according to Jildakī, the Elixir of Whiteness; by 'spirit' is implied the divine water. The 'long speech'

1. Tr., p. 53., Es., Vol. II., pp. 375-6

of Theodorus concerned the manner of powdering. Powdering and calcination take place at the preliminary stages of the operation and not after the Elixir of Whiteness has been produced. And, as was mentioned before, by powdering the Sages imply the breaking of a substance into small particles, which may be achieved by dissolution. And in this dissolution stirring is essential - a stick of hard wood or a wand of glass may be used as agitator, but a rod of gold is preferable. The main point is that the agitator should not be dissoluble. 'Then it is set aside to dissolve', said Theodorus, and he meant that there should be no stirring of the solution. But, adds Jildakī, a gentle fire, equal in strength to the fire of putrefaction, must be used to make the dissolution of the Elixir of Whiteness in the water complete, and, further, to coagulate the solution subsequently.

Sheikh: "Abudashir said to Amnuthasia (1), concerning the second part of the second operation, 'know that the compound changes colour in this operation and on account of this they liken it to the fruit of the palm-tree. The first of its signs is that which I have told thee of whiteness, then it changes to a dust colour which, if the kneading was properly done, should be between dust colour and green and yellow and pink; it then becomes pink to red; then a pure red, which finally becomes tinged a little with black, and it then becomes purple, but very often it goes directly from pink to purple. Its lustre is as the lustre of the sun in fine weather. It must be quite dry for the first moistening, but it is desirable that the remaining additions of moisture should be made while a little humidity is still left in it. The interval between each addition of moisture and the next should be a week. After the last moistening increase the fire until the substance is quite dry and the stone has become ruby red to purple. It is then excellent for the extraction of the tincture. Take care not to leave too much or too little humidity in the substance during the addition of moisture, for it will in the one case take up but little and in the other it will become dry before its time; but let it be in the just proportion.

" 'And if (the amount of the substance) (2) left is less than one tenth of the amount of the water, then when it has reached this stage the substance is now called "Venom of Vipers" and "Golden Sand" and "Diamond" and "Red Sulphur" and "Tree of Gold" and

1. Pt.
Es.

قال ابود شير لامنوثاسية

قال ابود شير لاوثاسية

2. The part between parentheses is added by Holmyard and is in agreement with Jildakī's interpretation.

"The Purple which has been dyed" and "Ruby Stone" and "Vitriol of Kings" (Lamp of Kings) and "Ruby" and "The Penetrating" and "Magnesia" " " (1)

The first colour to appear after whiteness is, says Jildakī, a light dusky yellow followed successively by green, bright yellow, pink, red of vermilion, red of blood, and red inclined to blackness. The blue colour, which, because of the presence of impurities, appears in the first combination, does not emerge in the second. Often a violet blue appears in the second operation, but that is different from the dark blue of the first. There is also a difference between the green colour in the first combination and that in the second. The green colour of the first compound is between black and blue, and that of the second between white and yellow: the former is dusky and the latter is shiny.

By 'the lustre of the sun in fine weather' is meant, continues Jildakī, the lustre (i.e., heat) of the sun when it is at the constellation of Leo, that is, at the time that fruit, grain and cere^eals begin to mature. 'It must be quite dry for the first moistening', said Abudashir, and he was right. For without being completely dry, the compound, i.e., the Elixir of Whiteness, would not absorb all the moisture added to it in the second combination. But 'it is desirable', as the Sages said, 'that the remaining additions of moisture should be made while a little humidity is still left' in the compound. Otherwise the compound may be coagulated before it is completely matured, after which it would be very difficult to dissolve it again. Moreover, the continuous presence of a little amount of moisture in the compound is a guarantee against a sudden and damaging increase of heat. There are on the

whole ten moistenings: three white and seven red, that is, three times for the preparation of the Elixir of Whiteness and seven times for the preparation of the Elixir of Redness. And each addition of moisture takes a week to complete. "After the last moistening increase the fire until the substance is quite dry and the stone has become ruby red to purple", said Abudashir, and by 'the substance' and 'the stone' he meant the same thing, that is, the Elixir. The Sages often refer to the Elixir, to its raw material, and to the different forms it takes up before the completion of its production, as 'the stone'. The name 'stone' signifies that the material of the Elixir is from the mineral and not from the vegetable or the animal kingdom. And, if the Sages sometimes say that the stone is an animal, it is because they want to point out that it is, in contrast with other mineral substances, capable of growth and motion. In this connection Jildakī quotes a couplet from Khalid (1) and a poem from Sāhib.

The compound, after the addition of ten portions of moisture, each equal to it in weight, transforms into the Elixir of Redness to which the Sages gave many different names. These names are not given fortuitously: each one of them points to a particular property of the Elixir. "Venom of Vipers" is a name which demonstrates the Elixir's power of penetration, "Diamond" indicates its hardness and firmness, "Red Sulphur" implies that it contains certain amount of the red unflammable oil, etc.

Sheikh: "Khalid Ibn Yazid, after mentioning the first part of the second operation, said in the rhyme of bā:
 "Combine^{it} with one single portion of its tinctures:
 It will become green and then yellower than flax.
 Combine it with another portion and they joy will be roused thereby
 For thou wilt see it saffron as the raiment of an adolescent
 child.

1. See p. 55 above.

For the third time, combine it with a portion of the tincture of the body which has changed,
 And thou wilt see it pure red; it is now a remedy for sickness.
 Combine it with a fourth part and thou wilt attain the objects of thy desire, and wealth.
 Thou wilt see it red as the jacinth which is strung on necklaces.
 Combine it with a fifth portion and thou wilt begin to see wonders from it,
 Combine it with a sixth portion to soften that which is hard of it,
 Then let it stay in the protection of thy oven (so that it may not be disturbed)
 For a month and a half 'in durance vile' to allow that which has separated to dissolve.
 Thus will it clothe itself in purple, the raiment of the King's glorious majesty.
 And among its colours will gleam that of the poppy which stands erect.
 It radiates rays of light as do the planets,
 And thou wilt see it of a brilliant red, like sparks of fire in wood.
 It is stable in the blaze and if placed therein remains solid.
 And know that thou⁹ thou givest it to drink a whole wine-jar of its poison, it will absorb it.
 This is the Elixir, so understand that which a generous and honourable one has told thee!" (1)

The words of Khalid, says Jildakī, are clear and need no explanation.

It is obvious that he is talking about the six moistenings. In the first moistening the compound becomes green and then yellow, and while it is green, it is referred to as 'the verdigris'. In the second moistening it takes up the colour of saffron, and for that reason is called 'the saffron of iron' (Fe₂O₃) In the third moistening the compound becomes red like the anemone and is referred to as 'the minium', 'the distilled blood of the two brothers', 'the coral', and 'the tincture of iron'. In the fourth moistening the red colour becomes deeper and the compound is then called 'the tincture of sulphur'. In the fifth and sixth moistenings the red colour continues to grow stronger and the compound, after the final

1. Tr., pp. 54-5; Es., Vol. II., pp. 386-7

adjustment of its weight, is referred to as 'the red sulphur', 'thetebr' (1) 'the fixed vermilion', 'the red settled slave', 'the king', 'the crown', 'the sun', 'the poison', and 'the fire'.

Referring to the problem of 'multiplication' or reproduction of the Elixir by additional moistenings, Jildakī says that the Sages kept this as a secret, but he, in his present book has given enough gentle hints to enable those worthy of the Art to understand it. He then proceeds to prove the possibility of reproduction of the Elixir on speculative grounds. The fusible, malleable bodies do not possess the power of rejection, and they incessantly originate in the hollows of the earth from smoke and vapour, that is, from uncoagulated sulphur and uncoagulated mercury. (2) When the smoke and vapour are pure and there is an equilibrium between the four natures, gold is generated. And when coldness prevails over hotness silver is produced. The origination of copper is due to the presence in the mine of a certain amount of corrupt and combustible sulphur which makes hotness and dryness to dominate over coldness and moistness. And now if hotness became less prevalent and dryness more dominant than is the case in copper, iron will be produced. Predominance of coldness together with dryness results in the origination of lead. Tin is produced when moistness predominates. A very sharp increase in dryness is the cause of the generation of crumbly bodies. Now, just as the mineral bodies continuously increase their bulk by feeding upon the

1. **شبر** : Broken or crumbled particles of gold, and of silver, before they are wrought.

2. See pp. 285-7 above.

food-stuff found in certain hollows of the earth, so the Elixir, which has a common origin with metallic bodies, reproduces itself by being fed on the divine water. The Elixir is first dissolved in the divine water and the resulting solution is subsequently coagulated by the application of heat. This process of multiplication could be repeated endlessly without any decline in the effectiveness of the Elixir.

Abī al-Hasan 'Alī b. Mūsā b. Arfa' Ra's, the author of Al-Šudūr (The Particles of Gold) spent, according to Jildakī, twenty-eight years of his life in studying the works of other Sages, mastering the theories of the Art, and performing operations. It was only after so many years of labour that he achieved his end and became prominent in the Art. He then engaged himself in reproducing the Elixir for thirty years. Jildakī quotes from Šāhib three couplets in confirmation of the above figures concerning the number of years the latter devoted to the study and practice of the Art. According to Jildakī, Šāhib was not older than twenty when he took up the Art, and towards the end of his life he gave up the Art and spent the few remaining years before his death in comfort and repose. From this it may be concluded that Šāhib lived about eighty years. Here Jildakī quotes several poems and couplets from Šāhib concerning the different stages of the operation. To some of these poems he had referred on previous occasions.

Jildakī then pronounces lengthy eulogies on God and praises Him for revealing the secrets of the Art and philosophy in general to human beings. He cautions the reader once again not to divulge the secrets to those who are not worthy of the Art. But how did the ancient tyrants and infidels, the worshippers of idols, stars, sun and moon, come to know about the Art?

In answer to this question, Jildakī says that the Art consists of two parts, namely, theory and practice. Those among the ancients who were well versed in theory could have not been infidel; for the existence of God, he argues, is one of the fundamental concepts in the Art. Those, on the other hand, who knew nothing about the theory and acquired only a practical knowledge, which they employed to collect wealth and suppress people, were in the end punished by God. One good example is Qārūn, who procured great wealth through the practice of the Art and became very powerful, yet in the end was defeated by Moses. Another example is Šaddād b. 'Ād, the founder of the famous garden of Iram, who died by the will of God at the gate of his garden before being able to take a glance at his own magnificent masterpiece. Amir Khalid, says Jildakī, in contrast with Qārūn, Šaddād and Alexander of Macedonia, did not employ his knowledge in the Art to collect riches for himself and to suppress the people, but like Solomon, he devoted his life to the service of God. Here again Jildakī quotes two poems and three couplets from Šāhib. The couplets refer to Khalid and his detachment from material interests in the world, and the poems are concerned with the importance of observing the rules of secrecy in the Art.

Jildakī says that Al-Ṭuġrā'ī's murder had nothing to do with his Vizierate, as is generally supposed: it was due to the jealousy of those who knew that he had achieved success in the Art and were, therefore, afraid that he might deprive them of their worldly possessions. An eye of Rāzī was put out with a hot iron and yet he did not reveal anything.

Jābir also suffered a great deal for his knowledge of the Art. Several attempts were made on his life, and finally he was forced to reveal some of his knowledge concerning the 'External' and meretricious operations to Hārūn al-Rašīd, to his vizier, Yahya b. Barmak, and to the latter's sons, Faḍl and Ja'far. Through the application of the Art the Barmecides became very wealthy and influential. This made Hārūn suspicious of them and, thinking that they might try to transfer the caliphate to the descendants of 'Alī, he dismissed them from office. After the downfall of the Barmecides, Jābir retired to Kūfa where he lived in secrecy up to the time of Ma'mūn. Then he appeared again, supporting the cause of 'Alī. b. Mūsā al-Riḍā, and Alide pretender, by which he got into trouble again. (1) Jildakī adds that the Abbasides could not have afforded to be so generous, nor would the Fatimides, who reigned over Egypt, have prospered, were it not for their access to the Art. The concluding words of the second volume of Nihāyat al-Ṭalab are devoted to the praise of God, Muḥammad, and the latter's family and disciples.

1. Cf. Kraus, Jābir b. Ḥayyān, Cairo, 1943., p. XLI-II.

VOLUME III.

IN THE NAME OF GOD THE COMPASSIONATE AND THE MERCIFUL

The opening words of the third volume of Nihayāt al-Ṭalab, like those of the first and the second, are devoted to the praise of God and Muḥammad.

Prologue to the third volume

Jildakī says that, in the first and second volumes of Nihāyat al-Ṭalab, he explained and enlarged upon the contents of Al-Muktasab in the manner of the Sheikh. There is left only one section of the latter work, the one "dealing with the knowledge of the nature of the dark sayings and hints of the philosophers;" which he would explain in the present volume. This volume consists of two books, each comprising two chapters. The first chapter of the first book concerns "the things which the Sheikh kept secret," and the second chapter deals with the manner of the projection of the Elixir. The first chapter of the second book is concerned with the explanation of the third section of the fifth part of Al-Muktasab, and the second chapter deals with "the resolution of allegories and the keys to the treasures."

VOL. III, BOOK I.,

CHAPTER I. : Explanation of things which the author of Al-Muktasab kept secret.

This chapter takes the form of a postscript to the first volume of Nihāyat al-Talab. For here Jildakī quotes for the second time some of the assertions of the Sheikh, which he had already dealt with in that volume, and he tries to draw the attention of the reader to certain points which the Sheikh, according to him, kept secret or failed to mention. But unfortunately Jildakī himself is little more informative on these points than the Sheikh.

The Sheikh, says Jildakī, described only one of the parts of the prime matter of the Elixir and concealed the rest. He did so in order to mislead those who are not familiar with the Art and the cryptic language in which it is expressed. The ignorant fools are apt to think that the Elixir may be generated solely from the part of the prime matter described by the Sheikh. But all the Sages know that every generation results from the combination of four things called 'principles', two of which are 'apparent' (earth and water) and the other two 'hidden' (fire and air). The Elixir, therefore, like any other thing, is produced by the combination of four things, namely, earth (comprising two

bodies), water (comprising two natures). In other words the four components of the prime matter of the Elixir are water, tincture, salt and earth. The two former are called the moist part and the two latter the dry part. In connexion with the part of the prime matter described by the Sheikh, Jildakī quotes the following passage from Al-Muktasab :

"... and we examined the metallic chemicals suitable for this purpose. And we found no substance from which it was proper to compound the Elixir except gold, ... and we found that the gold separates from the silver in the refining fire [by suspension] ... (1)

" The Elixir of silver is a part of the Elixir of gold ... When it is projected upon the two coppers or the two leads it converts them into silver. " (2)

It is not, comments Jildakī, the common gold to which the Sheikh refers: it is the gold of the Sages. Indeed, he goes on, all the substances to which the Sages refer are different from the ordinary ones. The difference between common gold and that of the Sages is that the latter is red, easily fusible, soft like wax, and has the smell of musk. But the two golds resemble one another in that they are both fusible, capable of combination, and fire-resisting. So we see, observes Jildakī, that "the Sheikh described (only) one

1. بالتمليق : Most probably purification by 'the solvent water'.
2. Tr., pp. 20-1; Es., Vol. III, p.6. For the omitted parts of this passage see pp. 58, 64 above.

part of the prime matter and even that incompletely."

Referring to the statement of the Sheikh, included in the above passage, that "we should feed it (the gold) with moisture of its own kind united with dryness of its own kind", Jildakī reiterates his previous arguments to the effect that substances do not combine ⁽¹⁾ with one another unless there is a similarity between them. In this connexion he quotes Aristotle as saying, 'at the beginning of Samā⁶ al-Ṭabī²ī (i.e. The Physics)', "Not anything originates from anything, nor anything transforms to anything fortuitously." ⁽²⁾ The Sages have said, he goes on, that "things unite with their like and oppose their unlike".

The Sheikh, continues Jildakī, did not actually say where the prime matter of the Elixir is to be found, though he spoke enigmatically of 'the cold peninsula of Andalusia', 'the caverns of Al-Astiyusia', 'a mountain in the land of India', 'a rock in which a devouring lion takes shelter', 'a sea-animal', etc. However, Jildakī himself is no more helpful than the Sheikh as to what the prime matter of the Elixir is and where it has to be found. He quotes in this

1. Dissolution was considered by Jildakī as a kind of combination, that is, a chemical change. And so was alloying.

2. See Kraus, Jābir b. Ḥayyān, Cairo, 1942, Appendices, p.320.

connexion a poem and four couplets from Ṣāhib. The latter describes the prime matter as a stone consisting of two parts, one of which is a pure, white substance, and the other, a tar-like material called 'moisture'.

Jildakī gives several other quotations from Al-Muktasab and on each occasion he points to one or two points about which the Sheikh was not clear. He refers the reader to the two preceding volumes of his book for elucidation and repeats some of his arguments contained in those volumes. In short he utterly fails to clarify the obscure points to which he refers. However, he himself has a different opinion of his own explanations: he considers them very satisfactory and revealing. ⁽¹⁾ He goes on to say that the inclusion of this chapter in his book is not due to his being jealous of the Sheikh. The latter, as was mentioned before, wanted to be brief and the fact that his words are at times obscure is no reflection on his reputation and eminence in the Art. Jildakī, on the other hand, intended to be as communicative as possible, and, moreover, he wanted his book to be worthy of its title, 'The End of the Search';

1. This attitude seems to have been very common among the Muslim alchemists; for nearly every one of them claims that his words are more enlightening and instructive than those of others.

so that the reader would not need to consult any other book on the Art after reading this. Jildakī contends that Al-Muktasab is the best short book and Nihāyat al-Talab the best long book that have ever been written on the Art.

(1)
VOL. III., BOOK I.

CHAPTER II. : On the manner of the projection of the Elixir and everything that relates to it.

The projection of the Elixir, says Jildakī, is a very important problem and the would-be practitioners of the Art must study it in all its bearings, theoretical as well as practical. The manner of projection varies according to the 'power' of the Elixir. It is, therefore, necessary to ascertain the power of the Elixir before projecting it. A Sage may produce the Elixir by his own efforts, or he may come into its possession by other means: searching for it in the ancient temples, of the Egyptians or in old graves, inheriting it from another Sage, defrauding an ignorant fool who owns it but has no idea as to its use or value, etc. The Elixir may have the appearance of a perfect, or an


1. Jildakī refers here to the third volume of his book as 'the volume of treasures'.

imperfect, mineral, of a plant or of an animal. It may be External or Internal. Its colour may be pure white, yellowish white, yellow, pure red, grey, or purple. It may be soft or hard, powdery or compact. The 'heaviness' of the Elixir of Whiteness is usually compared with that of silver, and the 'heaviness' of the Elixir of Redness with that of gold.

Here Jildakī gives a quotation from Jābir concerning the colours of the Elixir:

(1)

"The estimation of the quality of the thing produced, that is, the appraisal of its degree of perfection, depends on certain signs: the appearance of the colours originated by the action of fire. The tinctures must be either red or white, and by red is meant nothing but yellow in this Art. We need to point out here that the Elixir can be produced from substances in their natural state, from 'prepared' substances, or from both. And now what are the colours of these (three Elixirs) when possessing all the qualifications required - that is, the ultimate colour and its range? In the first place, concerning the thing (i.e., the Elixir) produced purely from substances in their natural state, I declare that 'the animal organs' originate from two to twelve medicines, and each of these eleven⁽²⁾ (compounds) has a different intensity⁽³⁾. The White of the first compound⁽⁴⁾ composed of two medicines is black, and its Red⁽⁵⁾ has the

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1. I.e., The Elixir.
 2. Eleven compounds made up respectively of 2, 3, 4, ... 12 medicines.
 3. 
 4. The Elixir of Whiteness produced from the first compound, i.e., the compound made of two medicines.
 5. The Elixir of Redness produced from the first compound.

(1)

colour of dust. The White of the best compound composed of three medicines is ashen, and its Red is even-red. The White of the best compound composed of four medicines is white, and its Red is red, and both of them are pure and limpid. The White of the compound composed of five medicines is dusty white, and its Red is even-red. As to the one composed of six medicines, its White is bluish-white, and its Red is blackish-red. Then comes the one composed of seven or eight medicines: its White is snowy-white, and its Red is pure pink. The White of the compound composed of nine medicines is white spotted with yellow, and its Red is red mixed or spotted with yellow. As to the one composed of ten medicines, its White is pale green, and its Red has the blue colour of the sky or of lapis lazuli. And as to the compound composed of eleven medicines, its White is white inclined to the colour of dust and to ashy-blue, and its Red is green inclined to blue and white. Finally the one composed of twelve medicines: its White is red, and its Red is white. These are the colours the absence of which indicates corruption. The colour of the compound, therefore, indicates its strength, quality, and whether it is good enough to be employed in the subsequent operations or not." (2)

Jildakī now proceeds to comment on the above quotation from Jābir. There is no doubt, he says, that colour is

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1. The literal translation of this sentence is: "The first compound, that is, the one from two medicines is of the colour of dust in Red, and black in White." I have made similar alterations in the translation of the analogous statements which follow. These statements create the impression that, according to Jābir, the Elixir of Whiteness need not be white, nor the Elixir of Redness red. The interpretation of Jildakī, however, as we shall see, is somewhat different, but not invariably.
 2. Es., Vol. III., pp. 26-7. The Arabic original of the last two sentences of the above passage is in a very bad form. I have tried to extract as much meaning from it as possible.

always an indication of quality. Blushing or becoming red in the face shows shyness, a pale or yellow face connotes fear, and, moreover, it is possible to tell from the colour of the face which one of the four humours is dominant in the body. Jābir was right in saying that 'The tinctures must be either red or white, and by red is meant nothing but yellow in this Art.'" For yellow, argues Jildakī, is the colour of gold, and red is nothing but concentrated yellow. And as to the white, it is the colour of water, and it manifests itself when soul dominates spirit and body.

Jildakī confirms the opinion of Jābir that "the Elixir can be produced from substances in their natural state, from prepared substances, or from both". To produce the Elixir, he goes on, from 'substances in their natural state' calls for a great deal of experience and skill. One should particularly know about the intensity of different fires and the right occasion for the use of each one of them. And when these substances in their natural state have been mixed and brought to a certain stage of consolidation, there should follow "the first purification, then the first separation, then the second mixing, then combination, then putrefaction, then the second separation, then combination, and thus to the end of the operation." This method of production takes a longer time than the two other methods, but it yields a

very strong and tinctorial Elixir. The second method consists of using both 'prepared' and 'natural' substances. The second method is quicker than the first, but it does not yield an Elixir as good as the one produced by the first method. The third method consists of using prepared substances only. It is quicker than the first and second methods, but its product is weaker and less tinctorial than that of either of them. For further information about the three methods of production of the Elixir, Jildakī refers the reader to his book called Al-Taqrīb fī Asrār al-Tarkīb and to 'numerous' books of Jābir.

The four principles are all present in the different varieties of the Elixir, but only when there is an equilibrium between them is the state of perfection attained. There are on the whole, Jildakī goes on, twelve medicines employed in the production of the Elixir, but it is not always necessary to make use of all of them. It is in this light that the reference of Jābir to the 'animal organs' may be understood. For the animal organs, like the Elixir, are found, on dissection, to be composed of not more than twelve different things, namely, "flesh, blood, fat, skin, veins, hair, bone, nerve, cartilages, marrow, ⁽¹⁾intestines, and gall. And as to

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: meaning also brain.

the philosophical animal, much sought after in this Art, it also consists of twelve parts, namely, water, smoke, mercury, sulphur, copper, black lead, lead, iron, alum, sal ammoniac, silver, and gold!' Jābir said that the Elixir may originate 'from two to twelve medicines'. By the 'two' medicines he implied moistness and dryness, and by the 'twelve' he meant the substances just mentioned. 'The first compound' to which Jābir referred is the incomplete Elixir obtained in the second combination after the appearance of the black colour. If this imperfect Elixir is projected upon copper, it will transmute the latter into silver, though the whiteness and splendour of this silver will not become apparent unless it is given several treatments in the smelting-fire. And if the compound is made to coagulate at this stage, it will turn from blackness to the colour of dust, and will on being projected upon silver transmute it into gold. The gold produced in this way is yellow and stable, but it has to undergo several treatments in the smelting-fire before it becomes pure and perfect. Now, the statement of Jābir concerning 'the first compound' may be interpreted "in a different way in connexion with the Major Operation." There, i.e., in the Major Operation, a similar result is obtained by coagulating 'the water' with 'the white earth or with tincture alone' and by cutting short the operation before the

completion of whitening.

By the 'compound composed of three medicines' Jābir meant, according to Jildakī, the one which is produced by coagulating the solution after the third 'white moistening', that is, 'when there is only one moistening left'. Partial coagulation at this stage gives to the substance an ashen colour, and the complete one gives it an even-red. In both cases there is no need for treatment in the smelting-fire before a satisfactory result is obtained.

The 'compound composed of four medicines' is the perfect Elixir: the white one is the Elixir of Whiteness, and the red one is the Elixir of Redness. This is true irrespective of the kind of operation, 'Major' or other, the reason being that, in the 'compound composed of four medicines', there is an equilibrium between the four principles. The best results, however, are obtained when the ingredients employed are all in their natural state.

The 'compound composed of five medicines' is produced by the combination of 'natural' and 'prepared' substances: the body is used in its natural state, the soul partially purified, and the spirit perfectly pure. ⁽¹⁾ But, if the solution is

1. Jābir explicitly said, we remember, that the eleven compounds are all produced from substances in their natural state. But Jildakī's interpretation of the words of Jābir is different; he assumes that these compounds include all the three varieties of the Elixir.

coagulated just before the 'red moistening, it would have the colour of dust at the White stage and would become even-yellow at the end of the Red stage."⁽¹⁾

The compound 'composed of six medicines' is the Elixir which is produced from "the prepared body, consisting of two parts, and the soul in its natural state, consisting also of two parts. There are, therefore, six parts altogether."⁽²⁾

The compound 'composed of seven or eight medicines' consists of "two parts of the water, two parts of the oil, two parts of the earth, and one part of the tincture, if it were from seven, and also one part of the leaven, if it were from eight." The Elixir produced in this manner is like the one obtained by coagulating the solution at the end of the second and third 'red moistening'.

The 'compound composed of nine medicines' is made exclusively from 'prepared' substances. The Elixir of Whiteness produced in this way consists of three parts of

1. In the above quotation from Jābir I took the term White to mean the Elixir of Whiteness. According to Jildakī, however, the term White refers to a certain stage of the operation, presumably the stage at which, under ideal conditions, a perfect Elixir of Whiteness is produced. A similar argument applies to the term Red.
2. Presumably the two parts left out were spirits.

'the water', three parts of 'the oil', and three parts of 'the whitened earth which has turned a little towards yellow'. This Elixir of Whiteness is like the one obtained at the conclusion of the process of moistening. The Elixir of Redness which is made exclusively from 'prepared' substances consists of one part of 'the earth', two parts of 'the white (of egg)', three parts of 'the water', and one part of 'the oil'.⁽¹⁾ This Elixir is similar to the one produced by three, instead of six, moistenings.

The compound 'composed of ten medicines' is produced from pure and 'prepared' substances. The White kind of this Elixir consists of three parts of 'the white earth', one part of 'the red earth', one part of 'the tincture'; four parts of 'the water', and one part of 'the oil'. The Red kind of this Elixir consists of two parts of 'the red earth', one part of 'the leaven', one part of 'the tincture', four parts of 'the water', and one part of 'the oil'.⁽²⁾ The Elixir of Whiteness prepared in this way is of the same degree of perfection as the one obtained by coagulating the solution prior to the last moistening. And the Elixir of Redness 'composed of ten medicines' is like the one produced

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1. Apparently two parts are left out.
 2. Apparently one part is left out.

at the end of the second 'red moistening'.

The Elixir of Whiteness 'composed of eleven medicines' consists of two parts of 'the white earth', two parts of 'cerated moon' (i.e., silver), two parts of 'the oil', and five parts of 'the water'. It resembles the Elixir of Whiteness which is produced before the last (white) moistening. The Elixir of Redness 'composed of eleven medicines' consists of four parts of 'the white earth', one part of 'the oil', half a part of 'the red earth', half a part of 'the leaven', and five parts of 'the water'. It is like the Elixir of Redness produced at the end of the second 'red moistening'.

The White variety of the Elixir 'composed of twelve medicines' consists of three parts of 'the white earth', three parts of 'the oil', one part of 'the tincture', and five parts of 'the water'. If it is moistened "with the red, that is, the golden yellow, it will transmute the copper, iron, and the two leads into a silver, upright as gold, and soft, under the hammer, like wax, so much so that it would not split even when it is laminated to the thickness of the skin of onion or thereabouts. And if this Elixir is projected upon silver, a gold would be produced with a fineness between $\frac{1}{3}$ and $\frac{1}{2}$." Now as to the Elixir of Redness

'composed of twelve medicines', it consists of three parts of 'the white earth', one part of 'the tincture', one part of 'the leaven', one part of 'the red earth', and six parts of 'the water'. When it is projected upon the two coppers and the two leads, it transmutes them into silver, and it is also capable of causing the transformation of the latter (into gold). The Elixir of Whiteness prepared in this way is similar to the one produced 'at the first stage of whitening'. And the Elixir of Redness 'composed of twelve medicines' resembles the one which is obtained by the coagulation of the solution at the fourth 'red moistening'.

In order to perform a successful projection it is necessary, continues Jildakī, after having finished his explanation of the passage from Jābir, to examine the Elixir in every respect: to determine its tinctorial power, its degree of stability, fusibility, and perfection; to understand whether the four natures or the four elements contained in it are at equilibrium, and if they are not, which one of them dominates the others and to what extent; to find out which one of the trio, i.e., soul, spirit and body, is in excess of the other two; and finally to know whether coagulation took place before or after the completion of the specified period of the whole operation.

By dropping a small amount of the Elixir on a 'plate'

and applying fire to it gradually, it would be possible to determine the amount of heat required for its fusion. And, further, by examining the effects of the fused Elixir upon the plate, the strength and stability of its tincture, and its power of penetration could be estimated. It is then necessary to find the answer to the following problems:

1. 'The time of fusion' of every imperfect metallic body.
2. Should the Elixir be projected upon the metallic bodies in their natural state or after they have been 'prepared'; and, if both 'natural' and 'prepared' body could be used, which one is preferable and yields better results?
3. If it is more desirable to use the metallic body in its natural state, what should be the intensity of fire employed for melting it, and what is the relation between this fire and that required for the fusion of the Elixir?
4. Alternatively, if the use of a 'prepared' metallic body is to be preferred, how this preparation should be carried out, and what is the relation between the weight of the particular variety of the Elixir employed and that of the body upon which it is to be projected?

After having sought the help of God to give him advice and enable him to write a special book on the projection of the Elixir, Jildakī proceeds to supply us with more information in connexion with the solution of the above-mentioned

problems. The Sages, he says, are in the habit of taking away a small amount of the compound from which the Elixir is produced when, in the course of the operation, it begins to exhibit tinctorial power. And they continue to do this at all the subsequent stages of the operation until the Elixir becomes perfectly mature. They then compare the effects of the fully matured Elixir with those of the immature ones. The mature Elixir, they divide into two portions one of which is employed for transmutation and the other for reproduction or multiplication. In the light of what has just been mentioned it becomes clear, argues Jildakī, that the main difference between the Elixirs to which Jābir referred lies in their degree of perfection.

There are two things, Jildakī goes on, that ought to be done in connexion with the projection of the Elixir, 'the spirituality of which is in excess of its corporeality'. Firstly, the body upon which the Elixir is to be projected must be melted in a crucible 'until it becomes a quivering mercury'. The crucibles, furnaces, bellows, tongs and other tools used in smelting must be in good condition. The charcoal used as fuel must be broken into pieces of almost the same size and weight in order to maintain the uniformity of fire in all parts of the furnace throughout the time of

melting. The crucible containing the metallic body must be firmly set in the middle of the fire: it should not touch the bottom of the furnace because the current of air supplied by the bellows would cool its lower part and thereby freeze the body. Similarly, if the upper part of the crucible is not covered with fire, the melting of the body would be hindered. On the other hand, if the fire is made too strong, it would melt the crucible and bring all one's efforts to naught.

Secondly, when the spirituality of the Elixir is in excess of its corporeality, it is necessary to add to it a certain amount of the borax of the Sages in order to make it more corporeal. And when this is done, the Elixir is quickly cast into the crucible and made to submerge 'with a long device having a sharp point'. Then as soon as the Elixir starts hissing and melting, the air is blown into the furnace more gently in order to avoid violent gurgling and boiling. Thus the Elixir melts gradually and mixes with the metallic body, and after that the contents of the crucible are transferred to a moulding-box, and that marks the end of the projection.

Now as to the Elixir the spirituality of which equals its corporeality, it melts with a moderate heat and should only be projected upon metallic bodies which melt with almost the same fire as it does.

Finally with regard to the Elixir the corporeality of which is in excess of its spirituality, it requires an intense fire for fusion and would transmute only those metallic bodies which are slow in melting. To make this point more clear, Jildakī gives an example. Glass, he says, is extremely dry and very little spiritual, and so when it is melted it does not mix with fusible bodies. But if it is made malleable by operation, it will turn into a thin fluid on melting and will easily mix with metallic bodies.

Even substances belonging to the same species, Jildakī continues, may present difficulty in mixing with one another. It is very difficult, for example, to mix iron with the two leads. And one has to know about all this before attempting to project the Elixir.

Jildakī then goes on to discuss the action of the two Elixirs on individual metallic bodies.

The Elixir of Whiteness transmutes 'natural' copper into silver with the help of the refining fire. The speed of transmutation will increase if the copper is partially purified, and melted two or three times, and if some borax of the Sages is added to it to make its red colour turn to yellow.

Iron must be made to melt as easily as silver before the Elixir of Whiteness is projected upon it. This could be done

by the addition of 'the borax of the Sages, the two whitened and calcined arsenics, and the water distilled from the white of egg.'" And if iron is made to melt as quick as the two leads, then one dirham of it would be capable of transmuting seven dirhams of pure tin into silver. And, moreover, when this iron is mixed with an equal weight of silver, it will acquire the qualities of the latter and transform into it.

The Elixir of Whiteness will have no effect on the two leads unless the latter are purified and made to melt with the fire required for the fusion of silver. By purification of the two leads is not meant a complete cleansing; for that would not be possible without 'dissolution and separation'. What is actually meant is a partial purification which can be achieved by the addition of the borax of the Sages in conjunction with several fire treatments. To be sure, the Elixir of Whiteness will have the desired effect on the two leads in their natural state, if only it is made to melt as quickly and easily as the latter do.

If the Elixir of Whiteness is 'tenderly' projected upon silver, it will slightly tincture the latter. This tinged silver on being mixed with pure gold will transform into it.

The Elixir of Redness in proportion to its tinctorial power transmutes silver into gold. The Elixir, as mentioned

before, may be of three varieties, according to whether its spirituality is in excess of its corporeality, or whether they are equal, or whether its corporeality outweighs its spirituality. This applies to the Elixir of Whiteness as well as to the Elixir of Redness. The excess of spirituality causes the Elixir of Redness to melt quickly, and for this reason its corporeality must be increased before it is projected upon silver. When the spirituality of the Elixir of Redness is equal to its corporeality, "there is need for the addition of the borax of the Sages". And lastly when the corporeality of the Elixir of Redness is in excess of its spirituality, silver should be made to melt more slowly before projection takes place.

Now, says Jildakī, take a number of thin silver plates and smear them with 'pure and uninflamable red oils' and let them dry. Then sprinkle them with a little amount of the borax of the Sages, place them one on top of another and wrap them tightly in a coarse cloth, smeared with 'the yolk of egg and borax of the Sages'. Then plaster the cloth with the clay of the Sages and keep the plates, covered in this manner, under hot ashes for one night. After that take off the cloth and clay covers and subject the plates to the smelting-fire: the colour of gold will then begin to appear.

It is possible to increase the speed of this operation by the addition of a certain amount of gold, which will also help to attain the accepted standard of fineness. The addition of gold may be followed by the projection of the Elixir of Redness which will still increase the speed of the operation.

The Elixir of Redness when projected upon gold, transforms it, in part, into the Elixir. The extent of transformation depends on the 'receptibility' of the gold and the tinctorial power of the Elixir. Metallic bodies which have been transformed into silver by the Elixir of Whiteness will transform into gold by the action of the Elixir of Redness. Just as the Elixir of Whiteness transforms mercury into itself, so does the Elixir of Redness.

Jildakī now proceeds to give us further information concerning the projection of the two Elixirs. There are, he says, certain things which one must know before attempting projection. These are as follows:

1. The intensity of fires employed in melting metallic bodies; and the manner of making a metallic body or an Elixir to melt with a stronger or a weaker fire. (1)

1. From what has already been mentioned about the projection of the Elixir, it may be concluded that, to use a modern term loosely, the melting point of all the ingredients, according to Jildakī, must be made approximately equal before they enter the crucible for fusion. Jildakī makes this point clear in the remaining part of the present chapter.

2. The Elixir of Whiteness must not be projected upon anything except 'the two coppers and the two leads', and the Elixir of Redness should not be projected upon anything but silver.

3. Mercury, when transformed into the Elixir of Whiteness, should not be projected upon bodies unaffected by the latter.

4. The mixture of the Elixir of Whiteness and silver has the same effect on imperfect bodies as the Elixir of Whiteness itself.

5. The mixture of silver and the Elixir of Whiteness, even when the latter is reproduced by projection upon mercury, has the same effect on imperfect bodies as the Elixir of Whiteness itself.

6. The mixture of the Elixir of Redness and gold has the same effect on silver as the Elixir of Redness itself.

7. If the Elixir of Redness is projected upon mercury, and then the resulting mixture is projected upon gold, and still the resulting mixture is projected upon silver, the latter would attain perfection.

8. If the Elixir of Whiteness is projected upon mercury and the resulting mixture is set aside, and if the Elixir of Whiteness is projected upon silver and the resulting mixture is set aside, and if from each of the two mixtures thus

formed one part is taken and, if the mixture of these two parts is added to ten parts of silver, the medicine obtained in this way will bring about the transmutation of imperfect bodies when projected upon them.

9. If the Elixir of Redness is projected upon gold, and if the Elixir of Redness is projected upon mercury and the resulting mixture is subsequently projected upon gold, and if the two mixtures thus formed are added together and projected upon silver, or, alternatively, upon gold and then silver, the latter would attain perfection.

From all this, argues Jildakī, it could be seen why the Sages said 'Our gold is not common gold'. Jildakī then goes on to enumerate the differences between common gold and that of the Sages.

1. The gold prepared by the Sages excels common gold in colour as well as in other properties - "the common gold which is nowadays referred to as 'The Sealed Egyptian' is only 10 carats fine."

2. If 14 carats of the Sages' gold is added to 10 carats of 'stout golden silver', the latter will immediately attain perfection and become gold.

3. The gold of the Sages is so ductile that it can be drawn out, like wax, into threads thinner than hair.

4. The gold of the Sages yields to the slightest amount of heat and can be formed into any desired shape.

5. "If an eyelash is cut with the gold of the Sages, it will cease to grow!"

6. "If the gold of the Sages is held over the heart of a person suffering from palpitation, he will be cured".

7. "If the eyes of a person suffering from continuous flow of tears are anointed with the gold of the Sages, he will be cured."

"The gold of the Sages", says Jildakī, "has many other properties and is beneficial in many other respects, but here is not the proper place for referring to them." But the gold, he continues, upon which the Elixir has been projected, excels the gold of the Sages in quality. Even the silver which has been transmuted into gold by the projection of the Elixir is better than the gold of the Sages. According to the Sages, the fineness of the gold upon which the Elixir has been projected is of legal standard and all other golds are compared with it. The 'gold of the mine', that is, the lowest kind of gold, may be made to reach the legal standard of fineness by 'suspension'⁽¹⁾, not, of course, 'the ordinary suspension' but that of the Sages. In this

1. See p. 418 above.

connexion Jildakī quotes a passage from 'the book of Mansūr al-Kāmilī'.

Out of one mitqāl of common gold, says the latter, only 14 carats (qīrāts) ⁽¹⁾ of first-rate gold is obtained by 'ordinary suspension'. And even then, the purple colour of the finest gold would not appear unless 'the ordinary suspension' is followed by 'a suspension of the Sages'. On the other hand, the common gold, when subjected only to 'the suspension of the Sages', acquires the perfection and the colour of the first-rate gold without, however, losing any of its original weight. 'The suspension of the Sages' is, according to Kāmilī, part of the first concealed operation and may not be explained except in a cryptical way.

In 'ordinary suspension' as well as in that of the Sages, comments Jildakī, the common gold is beaten into thin plates. But the Sages possess an unflammable oil with which they smear the plates and let them dry. They then sprinkle the plates with a mixture of 'the perfectly calcined salt and the pure shining white (of egg),' and after that they put them into an earthen crucible and subject them several times to the 'fire of suspension' until the purple colour appears. For further information with regard to the process

1. One mitqāl usually contains 24 qīrāts, but slight variations in weight are found in the different parts of the Muslim world.

of 'suspension', Jildakī refers the reader to his books Al-Taqrīb fī Asrār al-Tarkīb, Šams al-Munīr, and Gāyat al-Surūr. He then goes on to explain the saying of the Sages that 'Our silver is not common silver'. There are, he says, four main differences between the common silver and that 'prepared' by the Sages.

1. Common silver has a certain amount of impurities, whereas the 'prepared' silver has none.

2. Common silver melts only in the smelting-fire, whereas the 'prepared' silver melts and flows with the slightest amount of heat.

3. The 'prepared' silver tinges the copper with its excess of tincture, and this the common silver could not do.

4. The 'prepared' silver has a more lustrous appearance than the common silver.

The Elixir, and the body upon which it is projected must, continues Jildakī, "be approximately similar in melting', otherwise the one which melts sooner may be destroyed by fire before the fusion of the other is complete: ⁽¹⁾ "You will find this mentioned nowhere except in this our book." When the Elixir is projected upon a molten metallic body, all the impurities of the latter rise to the surface in the form of dross. If this dross contains no appreciable amount of the

1. See p. 438 above.

molten metal, it is thrown away. But if it does contain a certain amount of the metal, it should be subjected to another fusion, to make sure that only the waste matter is disposed with.

After the completion of the projection of the Elixir, the colour, malleability, hardness, taste and smell of the metallic body, its resistance in fire, its fineness, and the effect of the touchstone on it are all examined to see whether it has attained perfection or not. If it is found to be defective in one respect or another, the right thing to do is to look for the cause of defect. If under the hammer it was 'moist and soft', there is nothing essentially wrong with it; but if it is 'dry and brittle', this may be due to one of two things: the presence of impurities or the excess of the Elixir. The excess of the Elixir can be made good by the addition of a proportional amount of the base metal.

Jildakī now goes on to discuss the views of the Sages concerning the tinctorial power of the Elixir. The Sages, he says, differ in their words with regard to this question, but they mean more or less the same thing. Some of them, including 'the author of Al-Muktasab', declare that one part, say, one dirham or one mitqāl, of the perfect Elixir is capable of tincturing a thousand parts of the metallic body upon which

it is projected. This is true, continues Jildakī, of the Elixir produced by the 'Middle Operation', prior to its qualitative and quantitative 'multiplication'. He quotes a couplet from Khalid and another from Ṣāhib, both of whom subscribe to the same opinion. With regard to the tinctorial power of the Elixir produced by 'the Major Operation and the Minor Operation', Jildakī quotes two couplets from Ṣāhib, saying that one ḥabba of the Elixir tinctures 15 dirhams of the metallic body. ⁽¹⁾ Assuming that each dirham contains 16 ḥabba, ⁽²⁾ Jildakī multiplies 15 by 16, taking their product, 240, to represent the power of the Elixir. He quotes two other couplets from Ṣāhib concerning the tinctorial power of the Elixir produced by the 'Middle-Major Operation.' One dānaq of this Elixir, says the latter, is capable of tincturing one raṭl of the metallic body upon which it is projected. According to some of the modern Sages, says Jildakī, there are 140 dirhams in one raṭl, and according to some others, there are 160 dirhams in one raṭl. "But according to the ancient Sages one raṭl contains 20

1. Jildakī does not make it clear whether Ṣāhib referred to the Elixir produced by the Major Operation, or the Minor Operation, or both. But from what follows it may be concluded that the latter had the Minor Operation in mind.

2. According to Jābir:

1 dirham = 6 dānaq = 12 qīrāt = 45 ḥabba = 60 'asīr.
See Kraus, Jābir Ibn Hayyan, Cairo, 1942, Vol. II, p.25.

istārs and there are six dirhams and two dānaqs in every istār." Jildakī quotes here three more couplets from Ṣāhib. The first of these concerns the tinctorial power of the Elixir produced by the 'Great Operation lower than the Major Operation'. According to Ṣāhib, one part of this Elixir tinctures 6000 parts of the metallic body. The second and third couplets are concerned with the limit of the Elixir's tinctorial power: it could be so powerful as to tincture 'the sea' and create streams of silver and gold.

Jābir, according to Jildakī, when referring to the 'Major Animal Operation', recognized four kinds of Elixir, each produced at a different stage of this operation. One part of the first-rate Elixir is capable of tincturing 1,200,000 parts, one part of the third-rate,⁽¹⁾ 500,000 parts, and one part of the fourth-rate, 12,000 parts. Jildakī says that Jābir confessed to having produced only the second and third-rate Elixirs and none of the first-rate. These four Elixirs differ in three respects: length of time required to exert their desired influence, tinctorial power, and the power of transmutation.

Jildakī then goes on to tell us something about the

1. No reference is made to the power of the second-rate Elixir.

projection of the Elixir upon mercury. This projection, he says, is included in the concealed part of the Art. To carry it out successfully, one must know about "the secret of fire, the stable device; and the screen which prevents mercury from flying away." Mercury is first brought to boil and then the Elixir, together with the 'protective substance'⁽¹⁾, is projected upon it. And when the Elixir has melted and mixed with mercury, the fire is gradually withdrawn from underneath the crucible and the mixture is left to coagulate. And, if the Elixir is not strong enough to transform mercury thoroughly, "it should be first projected upon a body and then upon mercury." Furthermore, if the Elixir were not capable of purifying mercury completely, coagulation would not take place. The right thing to do, therefore; is to purify the mercury by sublimation before the Elixir is projected upon it. It would be advantageous also to dissolve the Elixir beforehand so that it would mix with the mercury more thoroughly. And to make sure that the Elixir which results from the transmutation of mercury will not be brittle, but soft and waxy, a certain amount of 'the

1. By 'protective substance' Jildakī means 'the borax of the Sages', which is added to increase the corporeality of mercury and prevent it from volatilization (See p. 434 above).

uninflammable white oil' should be added to the mixture. There are in the projection of the Elixir upon mercury "many secrets which it would not be appropriate to reveal here; for they are dealt with in particular places of our books."

To measure the tinctorial power of a given Elixir, Jildakī suggests the following method.

Project, he says, one part of the Elixir upon eight parts of a metallic body appropriate to it. And when these two have been united, project the resulting compound upon an equal weight of (a) copper or mercury, if it is the Elixir of Whiteness; (b) silver or mercury, if it is the Elixir of Redness. Now, with regard to the Elixir of Whiteness, increase gradually the amount of copper (or mercury) until no more silver of legal fineness is formed (or no further coagulation takes place). Similarly, with regard to the Elixir of Redness, increase gradually the amount of silver (or mercury) until no more gold of legal fineness is formed (or no further coagulation takes place). "In this way we will be able to know the tinctorial power of one part of the Elixir".

Jildakī devotes the last few pages of the present chapter to the description of two medicines used in projection: 'the virgin's milk' and 'the borax of the Sages'. Jābir, says Jildakī, in his K. al-Riyāq referred to 'the virgin's

milk' and considered it to be 'perfecting', while in other places, he regarded it as being 'defective'. The explanation is that in one instance he included it among 'the Externals' and in others among 'the Internals'.⁽¹⁾ As an 'External' it is made, according to Jābir, from 'the vinegar, qily, extract of litharge, calx of shell, eagle (i.e., sal ammoniac) and the like.' These ingredients must be pure and perfect, e.g., "the litharge should be whitened, the eagle sublimated, and the qily distilled". As an 'Internal' the 'virgin's milk' is the uninflamable oil employed in the operation.

Here Jildakī quotes Mary the Jewess as saying: "Every Elixir which does not coagulate and contains a (certain amount of) natural mercury fails to penetrate on projection." 'The meaning of these words is', explains Jildakī, "that if the Elixir is not heavy, that is, if it is not heavier than the body upon which it is projected, it will not penetrate on projection." Apart from this, he adds, heaviness of an Elixir signifies that its soul and spirit have been thoroughly combined with its body. In this connexion, he quotes a poem from Ṣāhib in which the latter says that the Elixir of Redness excels gold 'in colour and heaviness.' The Elixir

1. May be what Jildakī meant by 'External' and 'Internal' here was the 'exoteric' and 'esoteric' senses of the 'virgin's milk'.

of Whiteness, according to Jildakī, is heavier than silver, mercury, copper, pure iron, tin, "especially when it is pure", and lead. Even when the Elixir of Whiteness is unusually light, its heaviness is at least equal to that of lead, and it is still capable of transmuting the latter into silver; for it receives 'a gentle help' from the fire.

"There is one other peculiarity in lead: when its accidental qualities increase and it becomes intensely red, the projection upon it of a small quantity of the Elixir of Redness, or a little amount of silver, and subsequently a small quantity of the Elixir of Redness would transform it into gold; for its heaviness and redness are very near to those of the latter." For further information in this connexion Jildakī refers the reader to his book "devoted to the projection of the Elixir" and to his other book called Al-Taqrīb fī Asrār al-Tarkīb.

He then goes on to describe 'the borax of the Sages'. This is composed of equal weights of the following ingredients: "natron, brownish liquor of the cuttle-fish,⁽¹⁾ qily salt, prepared or natural tincar, borax of the Art, and borax of bread." These substances, after being mixed and pounded, are moistened with "the distilled water of the

1. زبد البحر

(1)
white of egg derived from sal ammoniac for one day and one night. The 'borax of the Sages' thus prepared " is used for different purposes in the Art, particularly for purification and softening of imperfect bodies prior to their smelting and combination".

VOL. III., BOOK II.

CHAPTER I. : Explanation of the third section of the fifth part of Al-Muktasab on the nature of the dark sayings and hints of the philosophers.

Sheikh: 'Know (may Allah the Exalted have mercy on thee!) that complete phrases are divided into three classes, (1) a phrase of exact agreement which perfectly describes the allusion; this is the plainest form of speech and is not used in an allegorical sense at all: it is, rather, straightforward; (2) a phrase of inclusion; this indicates a part only of the meaning and is more obscure than the first, in contrast to which it may be used in an allegorical sense; (3) a phrase of necessary association; this is more obscure than the first two and is simple allegory.'" (2)

(3)
A phrase, explains Jildakī, is either 'loose' or
(4)
'restrictive'. The Sages never use loose phrases. They

1. ما به بياض البيض المنظر المصعد عن النوشادر

2. Tr., p.55 ; Es., Vol. III, p.62.

3. مطلق

4. مفيد : Jildakī replaces this term in the course of his explanation by another (مفيد meaning 'complete' or 'useful'), suggesting that both imply the same thing.

always employ restrictive or complete phrases, which, as the Sheikh said, are divided into three classes. The ignorant fools are inclined to think that the Sages have no use for 'phrases of exact agreement'. In other words, they imagine that every assertion made by the Sages is allegorical. This, of course, is not true, says Jildakī. For the Sages employ all the three classes of complete phrases, and an intelligent person would have no difficulty in discerning the true meaning of their words. By means of 'a phrase of inclusion' the Sages describe the properties of 'the part', while giving the impression that they are referring to 'the whole', or vice versa. But the Sages express their allegories mostly by means of 'phrases of necessary association', for they are in the habit of referring to things in unconventional terms.

Sheikh : "An example of the first is when we describe man as 'the rational animal' (1) This is an exactly appropriate description, for it indicates the meaning perfectly and straightforwardly without allegory, and may be reversed when generalised : 'All rational animals are men' and 'All men are rational animals.' " (2)

Jildakī argues that the description of a man as 'an

1. حيوان الناطق : lit, the animal gifted with speech.
2. Tr., p.55 ; Es., Vol. III., p.64.

animal gifted with speech' is not satisfactory; for it applies also to the crow, parrot, and some other birds. But if man is described as 'an animal gifted with speech and having upright figure and broad nails', all other animals: including the ape and bear, will be excluded.

Sheikh : "An example of the second is the description of a man as an animal merely, for if it is generalised and reversed it is untrue; it is therefore partially allegorical. Thus, although 'All men are animals', the converse proposition, 'All animals are men' is untrue. But the partial converse is true, 'Some animals are men'. This therefore as a description of the thing meant is more obscure than the first". (1)

Examples of the use of 'phrases of inclusion' in the Art may be found, says Jildakī, in the references of the Sages to the stone. One such example is the description of the stone given by Buyūn al-Barhamī when addressing his pupil: "As to the stone, O my son, it is from the first hotness: an earthy smoke carried by the vapour of water." This definition of the stone, comments Jildakī, applies 'to everything which is originated in the earth', and it constitutes another example of referring to the general while meaning the particular;

1. Tr., p.55; Es., Vol. III, pp. 65, 66.

it is therefore partially allegorical.

Sheikh : "An-example of the third is the description of a man as a lion, in order to convey the idea of bravery by metaphor and simile. Most of the allegories of the Sages are constructed on this plan, that is, they describe the thing meant by indicating necessary characteristics of it.

"As for the way of 'inclusion', this is little used, in contrast to the way of 'necessary association', since it is more obvious. As for the way of 'exact agreement', this is not called allegory at all. Allegory must be either absolute, that is, indication by 'necessary association', or relative, that is (a) indicating by necessary association coupled with 'inclusion', or (b) indicating by 'inclusion' coupled with 'exact agreement,' or (c) indicating by 'inclusion' alone, or (d) indicating by 'exact agreement' coupled with 'necessary association.' "(1)

When a word, explains Jildakī, is employed to refer to something different from what it usually implies, it is tacitly assumed that there exists 'a mental association' between that word and the thing which it is supposed to describe. And it is important, in a 'phrase of necessary association', to understand the actual basis of comparison between the ordinary meanings of the words employed and the thing or idea which, in a figurative way, they are designed to imply. For example, when a man is described as a lion, it is not meant that he is wild and walks on four feet: it

1. Re., pp. 55-6 ; Es., Vol. III., pp. 66, 68.

is implied that he is strong, courageous and brave.

The ancient Sages, Jildakī goes on, described nothing in the Art except by allegory. But those who followed them began gradually to speak in less and less ambiguous language and to reveal more and more knowledge concerning the Art. Then came Islam. Khalid and Majrītī have attributed many statements on the Art to 'Alī b. Abī Ṭālib. All these statements are allegorical. Khalid himself wrote a book called Sahīfa in which he spoke mostly in allegory, especially when he referred to the stone, but he also used plain language. Jābir mastered all the theories and operations of the ancients and employed in his works phrases of 'exact agreement', 'inclusion', and 'necessary association'. He disclosed all the secrets of the Art in plain language, but he scattered his open assertions in his numerous books in such a way that only a learned man would be able to bring them together and understand their meaning. ⁽¹⁾ Rāzī, Ibn Waḥṣīya, and Ibn Miskawaih followed the example of Jābir and employed his method of presentation of the Art in their writings. As to Maslama al-Majrītī, he was well versed in the Art, but it is difficult for one who is not familiar with the writings of the Sages to understand his words.

1. Cf. Holmyard, The Works of Geber, London, 1928, p.196.

None of the Muslim philosophers who came after Jābir, continues Jildakī, attained the eminence of Ṭuḡrā'ī in the Art. But though he had immense theoretical knowledge, he found little time for practice. And for this reason he sometimes attached undue significance to minor problems, while paying little attention to questions of far more importance. He also missed the meaning of some of Jābir's statements. In spite of all this, his books are extremely helpful and of great interest. It is in his Haqā'iq al-'Istihād that he refutes Avicenna's arguments against the possibility of transmutation. The author of Al-Šudūr, the author of Al-Muktasab, and also Abū al-'Aṣba' b. Tamām al-'Arāqī attained eminence in both theoretical and practical aspects of the Art. But Ibn 'Umail al-Tamīmī paid more attention to practice than to theory.

As for Jildakī's own contributions to the Art, he leaves it to the discretion of the reader, who after having read the works of earlier Sages and carefully studied the contents of Nihāyat al-Ṭalab (the present book) would be able, if he is fair and just, to form his own considered opinion.

Sheikh : "Of their description by 'necessary association' we have an example in their phrase 'Eastern Mercury'. They mean by this the mercury extracted from their stones, and this is a phrase of 'necessary association', for

the Eastern Mercury is extracted from rocks, in contrast to the Western Mercury which is extracted from soft earth. Now if any characteristic of Eastern Mercury is found in their mercury they know it by this name. Understand that, therefore.' (1)

A phrase of 'necessary association', says Jildakī, has usually many different meanings. One or more of these may be true. And when there are several true meanings, it would not be possible to understand only one of them irrespective of the others.

Jildakī quotes Jābir as saying that the Eastern Mercury is hot and dry 'in one respect', and hot and moist in another. And he adds that the Sages give the name 'mercury' to any earthy substance in which dryness is predominant.

Sheikh : "And they often indicate by their phrase 'Eastern' a substance which is hot and dry as is the nature of the region of the East, and as is also the nature of the sun which appears from the East.' (2)

The reason why substances which are hot and dry are called 'Eastern' is, says Jildakī, that the sun with its hot

1. Tr., p.56 ; Es., Vol. III., p.71.

2. Tr., p.56 ; Es., Vol. III., p.75.

and dry nature rises from the East. 'The terrestrial globe! receives light and heat from the sun. The heat of sun unites the likes and separates the unlikes : without it there will be no maturing and, therefore, no perfection. But 'the sun of the Art' is different from the sun of heavens, though they have many properties in common. The sun of the Art 'radiates rays of wonderful lights', it cures the sick, combines the likes, and is the cause of prosperity in the world.

Sheikh : 'Similarly by the 'West' and by 'Egypt' they mean the moistness extracted from their stone, as the West is related to moisture.

'The River Nile means the same.

'The term 'Land of India' is also employed by them to mean a substance in proper equilibrium, resembling the land of India in the equableness of its climate." (1)

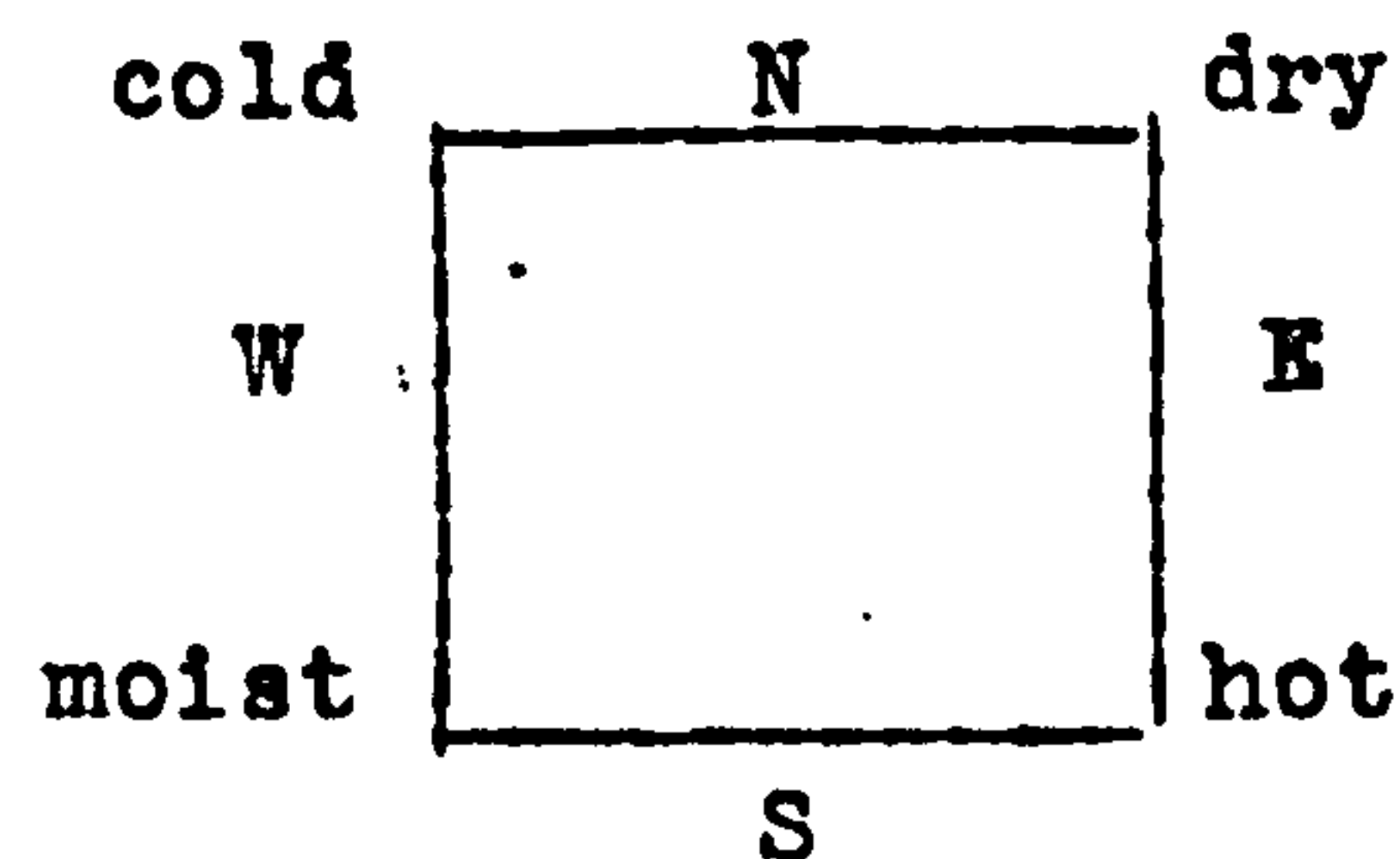
Jildakī quotes here two passages from the Book of Four (Tetrabiblos) of Ptolemy. The first passage deals with the influence of the heavenly bodies on the constitutions, customs, behaviour, and temperaments of peoples, and on the climate of that 'Quarter' of the inhabited world which includes 'Qūrmāhī, Egypt, Sās, 'Arāyis, Tar, ^cArīd, ^eTab ī, 'Arābiyā, and Middle Lifūbiyā, that is, Middle Ethiopia." The second

1. Tr., p. 56 ; Es., Vol., III, pp. 76, 83-4.

passage deals with the influence of the heavenly bodies on the climate and the inhabitants of the 'Second Quarter' of the inhabited world, which includes 'Land of India, Land of 'Arnānī, Hār, Yaśā, and Fārīnā."

Jildakī explains and enlarges upon the words of Ptolemy, not because, he says, the astrological assertions of the latter have any direct bearing on the Art, but for the following reasons: Firstly, to give the reader 'an exercise of the mental faculties', and make him more acquainted with the methods of the Sages and the manner of interpretation of their allegories. Secondly, to supply the reader with more information concerning the lands often mentioned by the Sages. Thirdly, to show how important it is in the Art to know about the climate and the state of natures (hot, cold, dry and moist) in different regions of the terrestrial globe.

Now, continues Jildakī, East is hot and dry, West is cold and moist, North is cold and dry, and South is hot and moist. Therefore, the lands lying between East and North are predominantly dry, those between North and West are predominantly cold, those between West and South are predominantly moist, and those between South and East, India, for example, are predominantly hot. In India there is an equilibrium between



dryness and moistness, while hotness, which is the cause of motion and life, is in excess of coldness. And that is why (a) the Indians live longer than other people, (b) the Indian plants have a fragrant smell, and (c) the precious stones and minerals are abundant in India.

Sheikh : " The terms 'heaven' and 'earth' are intended by them to mean two substances, one of them volatile like the heaven and the other stable like the earth." (1)

The Sages, explains Jildakī, give the name heaven not only to 'the volatile substance', but also to vapour, smoke, mind, spirit and the like. They recognize different kinds of earth (or land); "good earth; corrupt earth; pure earth; holy land; dry and thirsty land; moist land; land of rocks, caves and forts (barren land); green, cultivated land; and the land which contains all the colours, properties, tastes, and odours."

Sheikh : " By 'animal' they mean an animal characteristic, that is, a substance which, when it goes into the fire, acquires movement like the movement of an animal, the cause of whose movement is heat. They mean also by it a durable and equable substance, as an animal is durable and equable." (2)

1. Tr., p.56 ; Es., Vol. III., p. 87.

2. Tr., p.56 ; Es., Vol. III., p. 88.

A great number of people think, says Jildakī, that the stone is derived from the constituent parts (blood, hair, nerve, vein, marrow, bone, skin, cartilage, etc.), or from the excrements (fæces, urine, semen, etc.) of human beings. For, in the first place, they argue, man is the most perfect animal; and secondly, a number of Sages, such as Hermes Trismegistus, have, according to them, subscribed to this opinion. The latter they quote as having said, on oath, that "The stone is in it and from it," meaning by 'it' the human body. But the parts which make up the human body are also possessed, argues Jildakī, by other animals. The same thing may be said about human excrements. So, if the stone is not derived from animals, it could not be derived from human beings either. And thus the argument of the Sophists that it could be derived only from human beings is completely baseless. Moreover, Jildakī goes on, these people forget that the Sages have often said that the stone is from an egg. And how could it be from an egg and also from a perfect animal? For, it is birds which lay eggs, and they are not perfect animals.

The words of the Sages, therefore, must not be interpreted literally.

Sheikh : "By 'death' and 'life' they refer to a substance from which it is possible by suitable treatment to remove its lightness, and do away with its movement in the fire, so much so that when it is placed therein it shows no movement. Such are the limes and other 'dead' stones; they contain a characteristic of death as it is found in animals, [-and behold, the soul keeps on coming back to them-] ⁽¹⁾ a characteristic necessarily associated with these substances!" ⁽²⁾

There is no doubt, explains Jildakī, that every moving body consists of two parts, one of them coarse (or thick) and the other soft (or light). And it is possible to separate the light part from the coarse part, leaving the latter motionless; for it is the light part which is the cause of motion. Just as all living creatures die after the departure of their souls, so all 'living substances' employed in the Art become dead after their light parts have been separated from them. Ashes, calces, and 'dead stones' are examples of substances which have become immobile and inert.

(3)

Sheikh : "By 'life' they mean the opposite of this, like as it is reported in stories that the spirits returned to their bodies and they arose [-and that is what the Sages mean by resurrection-] ⁽⁴⁾; now this is a necessary characteristic of their stone and so they describe the latter thereby." ⁽⁵⁾

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1. The part between brackets does not appear in Pt.
 2. Tr., p.56 ; Es., Vol. III., pp. 90-1.
 3. I.e., of death.
 4. The part between brackets does not appear in Pt.
 5. Tr., p. 57 ; Es., Vol. III., p. 91.

Just as the separation of the pure part of a body from its coarse part has the characteristic of death; explains Jildakī, so the return of the soul to a dead body is thoroughly illustrative of resurrection and eternal life. (1)
 Jildakī refers the reader here to a passage he quoted before from K. al-ʿIhrāq (The Book of Combustion) of Jābir.

Sheikh : 'They also use the term 'marriage' meaning thereby a substance to which this name is necessarily appropriate; since it will join with a substance female in relation to itself, and its lightness is transferred to it as the sperm is transferred from the male to the female; they therefore describe it by this characteristic of it.' (2)

There lies in the above excerpt from al-Muktasab the hidden sense of the whole philosophy, says Jildakī. The Sages, when they obtain their stone and recognize a male and a female part in it, combine the two and extract the light part of the compound thus formed, and call it 'the sperm'.

Sheikh : "From this thou mayest judge of the rest of the analogies and allegories of the Sages. Therefore be grateful to him who has favoured thee with this explanation, and have compassion on him, and do thou likewise that which it is meet for thee to do. But do not explain this matter except to its followers, as said the most excellent Al-Andalusi, he of the Shudhur (May Allah have mercy on him!):

1. See p. 330 above.

2. Tr., p. 57 ; Es., Vol. III., p.92.

'Labour not, to expose our secret more than we have exposed it unto thee, or thy exposure thereof will expose thyself; And leaveth world and its pleasures to those whose only aim is enjoyment and sport and amusement. And let not doubt assail thee concerning that which I have spoken, for there is no disagreement among us in all that I have said.'

"(End of the third section, on the 'Meaning of Allegories', and with it ends the book called 'Knowledge Acquired Concerning the Cultivation of Gold.' So Praise^b to Allah, the One, and may He bless our Lord Muhammad and his Family and Companions and give them peace!)" (1)

The Sages, says Jildakī, employ phrases of 'inclusion' and 'necessary association' when they express their allegories. And for a learned person, assisted by the examples given by the Sheikh and others, it would not be difficult to understand the principles and the methods of the Art, and to lay open its secrets. The Sages, Jildakī goes on, write their books not for those who have already achieved success in the Art, but for those who, though learned and intelligent, are yet in need of guidance in order to bring their labours and hopes to fruition; and it is to these latter that the Sheikh addresses himself.

Jildakī repeats here his previous arguments concerning the importance of observing the rules of secrecy in the Art.

1. Tr., p.57 ; Es., Vol. III., pp. 92, 96. The part between parentheses does not appear in Es.

After having attained success in the Art, one should refrain from divulging its secrets to jealous and greedy people. One should particularly hide these secrets from kings, who are disposed to employ the Art as a means for enforcing their tyrannical rule and suppressing their subjects. Should a man let it be known that he knows the secrets of the Art, not only would vicious and greedy men interfere with his peace and comfort, but also God would punish him severely for breaking his vow and parting with the knowledge which was entrusted to him to pass it on only to those who are worthy of it.

Referring to the second verse in the poem of Ṣāhib quoted above, Jildakī says that there are in general two kinds of pleasure, one of them worldly and the other spiritual. Prophets, saints, philosophers, in short, all men of merit, strive after spiritual pleasure and are rewarded by God hereafter; these are the people who are worthy of the Art. The seekers of worldly pleasure, on the other hand, think of nothing but amusement and sport, and it would be dangerous to confide to them any secret knowledge that they might employ to gain their ignoble ends.

Jildakī once again praises Ṣāhib, and particularly the Sheikh, concerning whose book he says: "I swear by God, considering my great perseverance and my knowledge of the

books of ancient and modern Sages on the Art, that I have not found the like of K. al-Muktasab, or anything superior to it in guarding (the secrets of the Art) or more excellent in brevity and terseness of exposition."

Here, with the closing of the present chapter, Jildakī's explanation of the contents of K. al-Muktasab comes to an end. The next and last chapter of Nihāyat al-Talab, Jildakī devotes to quotations from a number of Sages, explaining them both in his own words and by making references to the words of others. He arranges these quotations under 4 'Exemplary Passages', ⁽¹⁾ 13 'Allusions', ⁽²⁾ 10 'Advantages', ⁽³⁾ 6 'Questions' ⁽⁴⁾ (or Divisions), 4 'Origins' ⁽⁵⁾ (i.e., Causes), 4 'Objects' ⁽⁶⁾ (or Purposes), 3 'Problems' ⁽⁷⁾ (or Queries), and 3 'Ends' ⁽⁸⁾ (or Conclusions).

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1. نَبذ
 2. نَكَت
 3. فَوَائِد
 4. فِصُول
 5. اَصُول
 6. مَقَاصِد
 7. مَطَالِب
 8. نِهَائِيَات

VOL. III. BOOK II.

CHAPTER II : Concerning the unravelling of dark sayings and keys to the buried treasures. Consisting of quotations from the words of the Sages.

Exemplary Passage 1.

Jābir : "The Sages sought to obtain a single nature in which the properties of natures from souls and bodies are united."

Jābir : "If you study these sciences carefully you will understand that what is sought after is from things, and from the properties of things, which are similar to one another, not dissimilar, friendly towards one another, not inimical; they are in no need of matter not found among themselves. And always after their union their powers increase until they become one nature, which is homogeneous, stronger and more penetrating than all of them."

These words might be interpreted literally by way of 'exact agreement', observes Jildakī. But this kind of interpretation, he goes on, would not be very helpful; for the only thing it would tell us is that the Sages have at their disposal a natural substance, which consists of analogous parts, is self-sufficient, and appropriate for the operation.

A far more comprehensive interpretation would be possible by way of 'inclusion' and 'necessary association'. By way of 'inclusion' we come to the conclusion that the 'single nature' of the Sages is a substance which consists of subtle

souls and gross bodies, closely related to one another. By way of 'necessary association' we could derive two extra meanings from the words of Jābir : 'The Sages thought to obtain'. The first implication is that the Sages were all in agreement, and the second, that the aim they set themselves was in the realm of possibility.

To understand the full meaning of the words of Jābir, the reader, says Jildakī, must try to answer the following questions: "What is the essence of the nature (i.e., the substance) to which he (i.e., Jābir) refers, what are its properties, and how does it originate? To which group, species, and genus does it belong? Is it possible to find among the substances of the world a nature in which the properties of the four natures are present? If it is possible, how should this be achieved, and if it is not possible, for what reasons? Supposing that the possibility of the existence of such a nature was established, is it to be found among the simple or compound substances, and in which kingdom (mineral, vegetable or animal)?"

There is, argues Jildakī, no doubt about the possibility of the existence of such a nature; for all the substances in the three kingdoms contain the four natures. But the Sages are not unanimous as to which kingdom this particular 'nature' (i.e., substance) is to be found in. Some of them say in the

animal kingdom, others in the vegetable, and, still others, in the mineral. Nevertheless, they all agree that it could not be partly from one kingdom and partly from another; for in that case there will be no similarity between the parts.

There is, continues Jildakī, an apparent contradiction in the words of Jābir. For while saying that the 'Sages sought to obtain a single nature' he adds later: 'after their union their powers increase until they become one nature'. Now, there seems to be no sense in saying that 'a single nature' becomes 'one nature'. The explanation is that by 'a single nature' Jābir implied a single species. Moreover, when he said 'they become one nature', he did not mean actually, but potentially; for it would be impossible for them to become one nature actually prior to 'separation' and the removal of impurities.

By similar arguments Jildakī evades answering the questions which he himself had set the reader. Being a true alchemist, he never comes to the point; he is far less clear than he pretends to be.

Exemplary Passage 2.

From Jāmi^e al-Asrār (The Encyclopedia of Secrets) of
 Tuḡrā'ī : The Sages are referred to as 'painters and creators.'⁽²⁾
 (1)

1. Lit : The People, i.e., The People of the Art.

2. القوم يسمون بالصوريين والمكونين

They are able to 'conquer' the natures and employ them in their service. Their operation is similar to the generation of metallic bodies, to the cultivation of seeds, to the reproduction of animals, and to the process of digestion. "They are called painters by way of allegory. That is, the skilful dyer among them takes the simple and pure principles which no one else could procure, and combines them, according to his desire, (forming) a compound (resembling that) of fusibles in viscosity ⁽¹⁾ and in stability on the two fires of smelting." ⁽²⁾

After referring the reader to the first and second volume of his present work, where he described the similarity between the operation of the Sages and cultivation, reproduction, and digestion, Jildakī proceeds to interpret some of Ṭugrā'ī's statements by way of 'inclusion' and 'necessary association'. His interpretation, however, does not make us any wiser : it contains no tangible fact but plenty of slippery ideas expressed in ambiguous terms. In one place he compares a statement of Ṭugrā'ī with those of Jābir quoted under the

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2. This is a very summary account of the rather long quotation from Ṭugrā'ī. The latter describes cultivation, reproduction and digestion in detail, but there is nothing in his words to which Jildakī had not referred before.

previous 'Exemplary Passage', and he observes that though both of them expressed the same idea, the former was clearer. He also quotes a statement which he says Jābir attributed to Socrates.

"If the adept were (not) able", says pseudo-Socrates, "to combine the souls and the bodies of the animal, (forming) a compound (resembling that) of fusibles in viscosity and dissolution, he would not succeed (lit : they would not fit together - i.e., the souls and bodies)." (1)

Exemplary Passage 3.

Mary the Jewess : "He who transforms the gold into poison cures all the diseases of the spirit. He who, not sowing gold and its mixtures, expects to reap gold is nearer to death than to success. So keep to the bodies in which gold is hidden, just as the fruits you eat are hidden in the slender pieces of wood you plant. From good comes good, and from bad, bad."

Here Jildakī quotes a passage from Ṭuḡrā'ī who, commenting on the above-mentioned words of Mary, calls Jābir and Zosimos to witness:

"The medicine", says Ṭuḡrā'ī, 'in order to become gold must undergo treatment. And as to her remark concerning the transformation of gold into poison, it is the nature of poison to be penetrative and permeating; and if it did not turn into poison it would not be complete. Likewise, Jābir said when he described the Elixir: 'They tried to make it not

1. Es., Vol. III., p.114 :

فان قدر فادران بركب ارواح الحيوان و

اجسادها تركيب الذائبات في التلنج والانحلال لم تتعارف.

Cf. Holmyard, The Works of Geber, London, 1928, p.108.

as thick as silver and gold, but thin, tender, spiritual, corporeal, volatile and permeating. Its soul and body must be from one and the same nature, (resembling) the nature of the volatile and permeating poison in thinness and tenderness. And they tried to make it not unstable in the fire, but (transform it into) a fiery poison, which feeds upon fire and is fostered in it and acquires tincture, brilliance and beauty from it. And since eventually it has to be used for projection, if its rank, strength, stability and permeating power are not as they ought to be, no benefit will be derived from it'. If Allah, the Exalted, were not, in the interest of lasting order and prosperity in the world, deterring the minds from understanding these words ... it would have been possible for anyone who read their books and used his brain to discover their secrets. But He prevents, by His Grace, the disclosure of the Art and reveals it to one person only at every stage of eternal time ... In this connexion Zosimos said: 'The Sages mix and combine their substances producing a single thing to which they give a single name. And they take oath, in the name of Allah, never to reveal this secret.' And I swear by Allah that I have explained clearly in this my book (only) the things which were not meant to be concealed."

Now Jildakī proceeds to comment on the words of Mary, Ṭuḡrā'ī, and Jābir.

Ṭuḡrā'ī, he says, failed to mention that the gold to which Mary referred was not common gold but the gold of the Sages, which may not be transformed into 'poison' unless it is completely purified. 'The medicine', said Ṭuḡrā'ī, "in order to become gold must undergo treatment," and by the phrase 'to become gold' he meant to become pure; for the Sages are in the habit of referring to every pure substance as 'gold'. Ṭuḡrā'ī used the term 'medicine' to indicate that the material of the Elixir is not a simple substance but a compound; for medicines are always compounds. Even

if the material of the Elixir were from one single substance, like humours, it would still be a compound of natures and elements.

Referring to the words of Jābir, Jildakī says that the Elixir is not as thick as silver and gold, but it is heavier than either of them. And the reason, he goes on, why fire has so much beneficial effect on the material of the Elixir is that there is a great deal of similarity between the two.

Here Jildakī has something interesting to say about Jābir and Ṭuḡrā'ī. The latter, he says, rightly called his book Al-Asrār (The Secrets);⁽¹⁾ for, judging from its contents, he knew all the secrets in the theory and practice of the Art. But there are found in his works statements which are apt to raise doubt as to his ever having produced the Elixir. As an example of such statements, Jildakī quotes two couplets from Ṭuḡrā'ī's famous poem Lāmiyat al-ʿAjāmī. Though, Jildakī continues, Ṭuḡrā'ī once wrote "In comparison with what God has bestowed upon me the Elixir is negligible," yet, in contrast with Jābir, he never mentioned in his books that he had actually produced and 'handled' the Elixir. The

1. The full title is : Jāmi' al-Asrār. This is the book from which Jildakī took the passage quoted above.

latter wrote all his books after he had arrived at successful results in his operations. And the operation he favoured most was the famous Middle Operation, in which respect the majority of ancient as well as modern Sages agree with him. It is only after years of study and labour that one may come to understand the 'right way' in the Art. Ṭuḡrā'ī found the way, but as he wanted to employ his knowledge, bestowed upon him by God, to acquire power and position, one of his friends, being disloyal to him, disclosed his intentions and caused him to be put to death.

"Therefore", remarks Jildakī, 'he who finds access to this science, nay, to a part of it, must not reveal it to anyone unless he has the greatest confidence in his intelligence, faith, and honesty; and such a person is rarer than the red sulphur which is the Elixir."

Exemplary Passage 4.

From K. al-Rahma (The Book of Mercy) of Jābir : "Learn how to perform your combination (lit., reconciliation) of natures from bodies and souls in such a way that not one soul departs from (its) body, nor one body from (its) soul. The red has the nature of red, and the white has the nature of white. Likewise they said, 'Gold originates only from gold, and silver only from silver!'"

This excerpt from K. al-Rahma, comments Jildakī, contains many difficult secrets of the Art concerning the External and Internal methods; for it refers to the question of reconciliation (or combination) of souls and bodies. 'Reconciliation' will only take place when the things to be 'reconciled' are similar in certain respects and dissimilar in others. ⁽¹⁾ And in every combination there is an active part and a passive; and all parts should be purified if an effective union is desired.

In the saying of the Sages, "Gold originates only from gold, and silver only from silver", by the second 'gold' is implied the gold of the Sages, and by the second 'silver, the silver of the Sages. The silver of the Sages is obtained by increasing the tincture of common silver, that is, by heating it "and dissolving it a natural dissolution", so that corruption does not ensue. If the silver produced in this way is projected upon copper, it will transform the latter into a white and pure silver "capable of standing the examination in proportion to the increase in its tincture and spirituality". Similarly, if the tincture of common gold is increased 'to its natural limit' without becoming corrupt, on being projected upon silver, it will transform the latter

1. See p.297 & fol. above.

into pure gold "capable of standing the examination in proportion to the increase in its tincture and spirituality".

This is an External method of transmutation. In the Internal method, the Elixir of Whiteness and the Elixir of Redness are used. (1)

Allusion 1.

From the second part of Jāmi' al-Asrār of Ṭuḡrā'ī :

"There are souls in the interior of souls. They are, like the souls of bodies, submerged, and do not become perceptible to the senses by any artifice except the favour of the operation causing them to be assisted by their kind. Similarly, there are souls in the interior of bodies resembling the free and submerged souls." (2)

It is important for the student of the Art, says Jildakī, to understand what the Sages actually mean by 'souls' and 'bodies'.

There are those, he goes on, who recognize three kinds of substances (souls, spirits, bodies), those who recognize four (corpses, (3) souls, spirits, bodies), and those who recognize a greater number of varieties. Some of the Sages

1. It appears that by External transmutation Jildakī meant alloying of gold and silver with the base metals, though it is not always easy to see what he means by the terms 'External' and 'Internal'.

2. Es., Vol.III, p.129.

3. اجسام

(1)
 give the name 'corpse' to any 'spatial' substance with three dimensions, be it soul or body; "and this causes some difficulty." Some other Sages give the names 'souls' and 'spirits' to those substances which volatilize by the action of fire, and give the name 'body' to any substance which is stable in the fire. Some others give the name 'souls' to 'waters', 'spirits' to 'oils', 'corpses' to 'salts', and 'bodies' to 'earths'. Some others give the name 'corpses' to 'ashes'. And some others imply by 'corpses' everything capable of dissolution and 'separation'.

The souls, continues Jildakī, are either free or restricted. Free souls are those which contain no impurities. Restricted souls, on the other hand, are mixed with impurities found in their mines. The reason why these latter, in spite of their being impure, are called souls is that their soul content is preponderant; and it is a usual practice among the Sages to refer to substances by the name of their predominant constituent. The restricted souls could be made free by the removal of their impurities.

With regard to the difference between 'bodies' and 'corpses', Jildakī says that the former are 'thicker' and 'denser' than the latter.

By the 'souls of bodies' Ṭuḡrā'ī meant, according to

Jildakī, the souls of fusible bodies, i.e., 'the fluid mercuries'. The 'souls of souls' are also 'fluid mercuries', and, moreover, 'in comparison with pure water and all the boracic waters, they are in their natural state'. And it was for these reasons that Ṭuḡrā'ī compared the 'souls of bodies' to the 'souls of souls'. The use of the term 'submerged' by Ṭuḡrā'ī has a particular significance: it implies the existence of two distinct parts, one of them 'thin' and the other 'thick', the latter sinking in the former.

Ṭuḡrā'ī said that the souls of bodies or the souls of souls do not become perceptible to the senses unless they are "assisted by their kinds". This statement, says Jildakī, includes one of the secrets of the first concealed operation; for it conveys the same idea as the famous saying of the Sages : " Things agree with their like and oppose their unlike".

The 'souls in the interior of bodies' resemble the 'free and submerged souls', as Ṭuḡrā'ī said, but 'freedom' is not a point of resemblance between the two; for the former are restricted by the bodies in which they reside, becoming perceptible to the senses only when those bodies are melted.

Allusion 2.

Here, Jildakī gives a quotation from Ṭuḡrā'ī, purported to be an explanation of the latter's own words quoted in connexion with Allusion 1.

"The artificer", says Ṭuḡrā'ī, "could not separate the souls in the interior of souls from souls by cleansing, or purification, or fire, or by any other means. Similarly, the two terrific fires could not extract from bodies the souls hidden in their interior. And nothing of the souls in the interior of souls, or in the interior of bodies, is perceptible to the senses; they are neither seeable nor touchable: their existence is proved only by reason, the truest witness. The similarity between the souls and the pure water in clearness and colour, on distillation, and their dissimilarity in taste, odour, heaviness, action, and quality - these latter properties are not present in the water - prove the existence of the souls of souls."⁽¹⁾

By the 'souls of souls', explains Jildakī, Ṭuḡrā'ī meant "the fire and the air. And, indeed, these two are not seen by the eyes, but they are perceived through their effects. The sundering of the gross from the subtle in the Art is only possible by the method of separation."

It is only, continues Jildakī, the 'bodies used in the

1. Es., Vol. III., p. 132.

Art' whose souls could not be extracted by the 'two terrific fires', and not bodies in general. And only the souls of bodies and souls which are in their natural state are imperceptible to the senses. The souls of souls become perceptible to the senses by operation, and those of bodies, by the smelting-fire.

Allusion 3.

Referring to the statement of Ṭuḡrā'ī concerning the similarity between 'the spirit' and 'the pure water', Jildakī says that just as 'the pure water' quenches the thirst and permeates all the substances of the three kingdoms, so 'the spiritual water of the Sages' exhibits wonderful qualities. It is rightly called 'the water of life'; for it revives the dead and cures the blind and the leprous. A metallic body is said to be dead when it suffers from the excess of either hotness or coldness, it is said to be blind when dryness and 'blackness' prevail in it, and it is said to be leprous when coldness and moistness are the predominant natures in it.

Allusion 4.

God, says Jildakī, has invested matter with the quality of 'abandoning one form and adopting another'. Every form, he goes on, represents certain particular qualities, and

change of form is accompanied by change of properties. 'The water of the Sages', for example, passes through four stages of development (i.e., the first concealed operation; marriage and putrefaction; separation, distillation and purification; and rejuvenation) and acquires different properties at each stage.

Allusion 5.

(1)
Tuḡrā'ī : "As to the souls of bodies, their existence is proved by : the inability of the two fires to dominate over bodies, without mercy, when they are unprepared; the adhesion of their combustible particles; their refusal to combine, when in their natural state, with (extra) moistures; and their quality of being divisible, by a single operation, into (minute) particles, the smallest possible in practice. It is perhaps possible to divide these into still smaller particles by imagination, but our knowledge, indeed, concerns what is real and not illusory. And if, like the souls of souls, they are divided into parts, they will not precipitate, and if they do not precipitate, they will not separate, and when there is no separation, union and combination will result, and thus the natures concur. But only the soul, on disintegration of the body and dissociation of its parts, becomes stronger by reaching the depths of the body and bringing out from its interior its contents of bodily souls. The body accepts the partnership of the soul both because and for the sake of the bodily souls contained in its interior. This is the complicated relationship of which mention has been made in the books. Examples of it could be found in the words of prophets. The souls are like enlisted soldiers: they do not know either their allies or their enemies, and this is a spiritual relationship. And besides this kind of relationship, there is the attraction of the magnet for

1. According to Jildakī, the present quotation from Tuḡrā'ī follows the one quoted in connexion with Allusion 2.

iron, referred to as 'the sympathetic property'. This is a peculiarity of the magnet, and if there were other things exhibiting the same property it would no longer be called sympathetic : it would be a common accidental property." (1)

Here, Ṭuḡrā'ī has employed phrases of 'necessary association', and that is why, explains Jldakī, his statements, if studied superficially, give the impression of being contradictory.

By the 'souls of bodies' Ṭuḡrā'ī meant the souls of metallic bodies. Metallic bodies are fusible but not combustible: when they solidify after their fusion, they become malleable again and not crumbly. Ṭuḡrā'ī did not imply by the phrase 'the adhesion of their combustible particles' that metallic bodies are combustible. What he meant was that fire 'flows' into the interstices of these bodies and, thereby, melts them and makes them combustible; and after the removal of fire they return to their original state. Metallic bodies, in their natural state, contain some moisture, but they refuse to combine with extra quantities of it.

It is possible to reduce a metallic body to a very fine powder by 'a generative decomposition and not a corrupting one'. The particles of the powder thus prepared are extremely small and it is not practical to make them any smaller. Theoretically, of course, it is possible, 'as

1. Es., Vol. III., pp. 136-7.

some of the philosophers maintain', to 'cut' any particle, no matter how small it is, into two parts. But when the particles are so small that the eyes can hardly see them; for practical purposes they may be considered indivisible.

When metallic bodies are pulverized thoroughly by calcination and then dissolved in 'a natural dissolution', that is, when, in the words of Ṭuḡrā'ī, 'they are divided into parts like the souls of souls', no precipitate is formed. On the other hand, if their pulverization is not complete, they will not be transformed into the nature of the solvent and, since part of the powder precipitated at the bottom of the vessel, no homogeneous compound is formed. A thorough pulverization makes it possible for the soul (i.e., the solvent) to enter the interior of metallic bodies and combine with their 'hidden souls'.

Other philosophers besides Ṭuḡrā'ī have described the attraction of the magnet for iron "and there is no need for us", says Jildakī, "to enlarge upon their words here". Jābir, he goes on, discussed the 'natural' and 'sympathetic' properties of things "in his books on properties,"⁽¹⁾ in such a way that any intelligent person would be able to understand it.

1. K. al-Ḥawāṣṣ. Cf. Kraus, Jābir b. Ḥayyān, Cairo, 1943, Vol. I., p.33.

A 'sympathetic property', continues Jildakī, is confined to one particular thing only. The attraction of the magnet for iron, the hair-removing quality of depilatory paste, (1) and the allurements of amber to bewitch the straw, are examples of sympathetic properties; for they are not shared by other things. But there are also 'natural properties': properties common to two or more things. Scammony, for example, cures the excess of yellow bile, but it is not the only medicament possessing this property. Yellow myrobalam, cassia fistularis, tamarind, berberry, plums and many other things are also used for the same purpose. Sympathetic properties may strengthen or weaken the natural properties. Rhubarb, though it has a hot and dry nature, causes the high fever of some diseases to subside, and this is a sympathetic action. Now the effects of the Elixir on 'things and their opposites' are both sympathetic and natural.

When a property is shared by two or more things, it is no longer called 'sympathetic': it is a 'common accidental quality'.

Allusion 6.

Tuḡrā'ī : ' We described how water is able to cause the combustion known as dispersion, and why they said 'Its water is its fire'. Now why does the fire fail to effect this powdering in spite of its domination over bodies? .

1. نورة : A medicament made of quick-lime and arsenic.

This body, more than others, keeps a firm hold on its soul and is extremely niggardly of it. And thus there remains in it, far in excess of its weight, a certain amount of good soul, which can be extracted from it only by a skilful application of the two great fires. But if it is the submerged soul which remains in the body, how then does the fire become covetous of it and, by virtue of its strength, set it ablaze? The fire gets hold of the remaining soul because things seek their own kind and are inclined to join their like. Thus is confirmed the assertion of the Sages: 'Things agree with their like and oppose their unlike'. No one ever explained this before, so praise Allah, the Exalted; for I have guided you and revealed to you that of which the ancients and the moderns have been niggardly." (1)

These words of Ṭuḡrā'ī are apt, says Jildakī, to mislead not only the ignorant fools but also many of those experienced in the Art. It was mentioned before in this book, he continues, that in the first concealed operation as well as in the second and third operations (i.e., the first and second combinations) all the three kinds of materials, namely, soul, spirit and body, are needed. It was also mentioned that "the prime matter (of the Elixir) is from one thing and one species". And there was left no doubt that by the name 'body' is implied any one of the four coppers: "the unprepared red copper; the imperfect ābār-copper, the pure, shadeless red copper; and the pure white earth". Each one of these bodies has its particular properties, uses and effects, though they are all of the same species. Now, in the first

1. Es., Vol. III., pp.143-4.

place, Ṭuḡrā'ī does not make it clear as to which one of the coppers he refers to when he says "This body, more than others, keeps a firm hold on its soul and ..." Secondly, he fails to mention that the extraction of soul from body by means of fire alone ends in corruption. For a generative powdering or calcination the addition of moisture is essential; for otherwise the fire will destroy the 'adhesive moistness' of the body. Jildakī quotes here a poem from Ṭuḡrā'ī in which the latter refers to the importance of the presence of moisture in calcination. By 'this body', he goes on, Ṭuḡrā'ī meant 'the imperfect ābār-copper, which contains impurities and is more niggardly of its soul than the other three bodies. For after the extraction of the greater part of its soul, by dissolution in the water, there remains in this 'copper' a certain amount of soul which takes refuge in its interior. To extract this latter part of the soul, the body must be powdered, moistened and purified 'tenderly.' And after the completion of the extraction of the soul, the body becomes extremely white, like silver, and melts with a small quantity of heat. Subsequently the body is sublimed, and the strange thing is that after all this, when collected in the receiver, it is found to have gained in weight. To avoid any misunderstanding of the words of Ṭuḡrā'ī, it is worth mentioning that 'the ābār-copper' keeps no firmer hold

on its soul than the stone of the Sages.

Allusion 7.

Referring to the quotation given from Ṭuḡrā'ī in connexion with Allusion 6, Jildakī says that it makes him doubt whether the former achieved any success in practice. If what he meant by his obscure statements were in agreement with Jildakī's interpretation of them, then he was successful in both theory and practice. But if he meant something different, one is bound to come to the conclusion that, though well versed in theory, he was weak in practice. In any case he was not at all justified in saying that he revealed things that other Sages kept secret. For in the works of Jābir and others statements are found on the same subject which are much clearer than those of Ṭuḡrā'ī. And yet Jābir confessed that he intentionally made his statements obscure. "If we claim that our explanations are far superior in clarity to those of Ṭuḡrā'ī, we have spoken the truth. . Anyone with the slightest degree of intelligence will testify to this."

Allusion 8.

Ṭuḡrā'ī ⁽¹⁾ : "This wonderful assertion and this wonderful interpretation substantiate the statement of Democritus that 'The world is composed of indivisible particles'. All those

1. This passage is in continuation of the one quoted in connexion with Allusion 6.

sages who did not comprehend his ⁽¹⁾ views vilified him. And he, being niggardly of his science, guarded it, and avoided using clear language. How often did the Sages contend with him and contradict him! They discussed his assertion at length and yet its meaning remained concealed from them: he was in one valley, they were in another. Among the Sages ⁽²⁾ there were controversies like this on a number of subjects. We, however, discovered the hidden sense of his assertion, and, being provided with excellence of speech, explained it in such a way as to satisfy those interested in it. So, do not be astonished when you are confronted with strange things; for perchance there are more things to be learned beyond what you already know. In this category (of strange things) fall the views of Pythagoras, regarding numbers as the essence of all things; the assertions of Democritus concerning the principles, - these may be one or many - ; and the numerous dark sayings of Plato. Had it been allowable to me I would have proceeded with my arguments, but I loathe disagreement with my companions. In fact, I once referred to this hidden sense (of Democritus's statement) in an assembly of learned men. They were disgusted at it and opposed the idea, with the like of which they were not familiar. They were affected by the disease of the ancients. They were of those concerning whom the Most Holy said 'We found our forefathers believing in a religion, and we are following in their tracks'. Jābir was excessively emulative of the Sages and hotly reviled the philosophers in his ten treatises ⁽³⁾ and also in his K. al-Uṣūl (The Book of Principles), ⁽⁴⁾ in which latter he described the properties. These are not important works; for (in them) he did not discuss causes and means, revealed no new idea, and (even) did not make any addition to (his) chidings. And when he made a single allusion to a moot point such as those explained in this our book, he exaggerated its benefits and considered himself extremely generous." ⁽⁵⁾

1. I.e., Democritus.

2. Presumably, Greek Sages.

3. Cf., Kraus, Jābir b. Ḥayyān, Cairo, 1943, Vol. I, p.138.

4. Ibid., pp. 99, 125.

5. Es., Vol. III., pp. 152-3.

"A great number of philosophers" , comments Jildakī, 'thought that Democritus referred to the world of Existence when he spoke of indivisible particles. That is not so. What he actually had in mind was the world of the Art. And this, indeed is composed of particles indivisible in practice. That is to say that (a) they dissolve in such a way as to leave no precipitate; (b) after combination (i.e., dissolution), having got rid of all their impurities and defects, they return to their state of simplicity; (c) if they are then combined, they form permanent compounds. The obstinate contender would not agree with this interpretation, he believes that the (world of) Existence is composed of particles indivisible not only in practice but also by imagination and reason. This is an absurd belief. For every imaginable thing would accept division by imagination; and this is supported by reason. If we assume that a thing exists and constitutes part of a whole, we shall not doubt that it is spatial. And if it is spatial, it is surrounded by curves and straight line. And therefore, it will be cut into two parts by a line passing through it. Similarly, their notion that a line consists of indivisible small parts is absurd. What they say amounts to this, that particles which are practically indivisible, and which could not be divided by imagination or reason, are spatial and out of

their conglomeration the things originate. That is next to impossible; its absurdity is obvious, and all the people (of the Art) would agree that it is so. We do not propose to deal with this question exhaustively. But those who differ from us with regard to the interpretation of the words of Democritus are greatly mistaken. They are like those who believed that the words of the people (of the Art) concerning the fire and the heavenly bodies had a religious significance. Of these latter we spoke previously in this our book. The fact is that, as Ṭugrā'ī said, the people (of the Art) are in one valley, they are in another, and Democritus in still another."⁽¹⁾⁽²⁾

The statement of Ṭugrā'ī concerning the views of Pythagoras and the controversies among the Sages is clear and needs no elaboration, says Jildakī. "The people", he goes on, "detest anything of which they are ignorant." But Ṭugrā'ī was not right in calling those kind of people 'learned men'. For, if they were learned, they would not have adopted that attitude towards Ṭugrā'ī's interpretation of the words of Democritus: they would have been able to differentiate between true and false.

But Ṭugrā'ī's criticism of Jābir is an unjustified

1. I.e., those who do not agree with the alchemists' interpretation of the words of Democritus.

2. Es., Vol. III., pp. 153-4.

encroachment upon the rights of the latter. Jābir was not, says Jildakī, vindictive towards the ancients, and everything that Ṭuḡrā'ī says about him is false. "Jābir threw the jewels on the ground under their feet, but only a few picked them up." This is not a reflection on the intelligence of Ṭuḡrā'ī. He was a profoundly learned man, but being weak in practice he misunderstood Jābir. Since he did not find any reference to the 'causes and means' in the two books of Jābir mentioned above, he concluded that the latter did not discuss these subjects at all. But, in fact, Jābir discussed 'causes and means' in many of his books, though, as usual, he dispersed his assertions in various places. And yet, he was much clearer than other Sages, ancient as well as modern. His words on 'External operations' and also on the 'Major Internal operation' are particularly more lucid and more intelligible than those of Ṭuḡrā'ī.

Allusion 9.

It appears, says Jildakī, that Ṭuḡrā'ī, like other Sages who came after him, confined himself only to the Middle Operation, and did not know anything about the Major Operation and the rest. Though the majority of the Sages favour the Middle Operation and give most of their attention to it, yet that does not imply that they completely neglect other operations.

Here Jildakī refers to some of his previous statements concerning the properties of 'the water', 'the oil', 'the tincture' and other substances. He also repeats his former assertion that the Sages give different names to the same substance, and the same name to different substances. Some substances, he adds, are used in all the operations. One such substance is 'the sal ammoniac which is alum' mentioned by Jābir in his K. Zahr al-Riyād, part of the 500 Books. But there are other substances whose use is limited to a certain particular operation. Not being able to understand as to which operation the old Sages referred in each particular instance, and assuming that they were all the time speaking about the Middle Operation, Ṭuḡrā'ī and those who came after him failed, on a number of occasions, to grasp the true meaning of their assertions and consequently often contradicted themselves.

Allusion 10.

It may be, says Jildakī, that Ṭuḡrā'ī and those who followed him knew all the various methods of the operation and their results, but made no reference to them in their books for either of the following reasons. Perhaps they thought that since Jābir and other Sages before him dealt exhaustively with all the various methods which could be employed in the Art, there was no need for them to say

anything in that connexion. Or perhaps they decided to apply themselves to one operation and one method only; and if their writings sometimes give the impression that they spoke of different operations, that is because their terminology is not properly understood. However, they chose the 'middle road' and gave all their attention to the Middle Operation; and there was no difference among them with regard to the constituent parts of the stone.

All the methods, Jildakī goes on, employed by the Sages in their operations are valid, and each one of them constitutes a proof that the Art is genuine. Jābir, Rāzī, Ibn Wahṣiyya, and Ibn Miskawayh, though they described many different methods in their works, recommended the reader not to waste his time and money in trying them all, but to apply himself mainly to the Middle Operation. Al-Majrīṭī also, in Rutbat al-Hakīm (The Sage's Step)⁽¹⁾ and in his other books, spoke in favour of the Middle Operation. But Ibn Umayl, on the basis of his own experiments with the stone, initiated certain methods to which he gave the name 'kitchen gardens'.⁽²⁾ "And we have followed in our books", says Jildakī, "a comprehensive course of the Middle Operation. And since to us was revealed everything concerned with this science,

1. Cf., Holmyard, Makers of Chemistry, London, 1946, pp. 77-80.

2. مبائل

we devoted this our book and K. 'Ġāyat al-Surūr and K. al-Šams al-Munīr and K. al-Taqrīb fī Asrār al-Tarkīb and K. Šarh K. al-Rāḥa (Commentary on the Book of Repose) of Jābir to important, useful and comprehensive allusions, which if mastered by the seeker of knowledge would enable him to grasp all the principles and doctrines of the Art.'

Allusion 11.

Zosimos, according to Jildakī, addressed Euthasia (Theosebia), in Muṣḥaf al-Šuwar (The Book of Forms) and other places, saying that 'There could be no fusion without coction and powdering, no coction without fire, and no powdering without water.'

The Sages, comments Jildakī, differ among themselves as to the meaning of the term 'fusion'. Some of them take it to mean calcination and separation of parts by 'a sort of moistening'; others, dissolution in the water; others, reduction into a fusible and adhesive oil; others, reduction into a fluid mercury; others, ceration; and others, melting in the fire. But in all these cases coction and powdering are indispensable, and Zosimos did not mean any particular kind of fusion, but fusion in general. So it is usually left to the student of the Art to find out for himself what is actually meant by fusion. As to the intensity of fire

for fusion, it should be gentle except when melting is implied.

Jildakī relates here, also from Mushaf al-Suwar, a conversation which Zosimos had with another man. Zosimos once came across a man who was powdering 'the secret' and who failed in the end. Zosimos told the man that what he did was not the powdering of the Sages. 'What did the Sages mean by powdering?', asked the man. 'They meant powdering by nature', replied Zosimos. 'And where is the nature to do the powdering to be found?', retorted the man. Zosimos understood that the man was ignorant, left him and went away. The moral drawn from this story is that one should always avoid talking to ignorant fools, and Jildakī supports this by quoting two verses from the Koran.

Allusion 12.

Zosimos said to Euthasia that it is necessary to understand the words of Democritus: "Place it upon silver, and it will become gold; upon gold, and it will become the leaven of gold."

By silver, comments Jildakī, is not meant common silver, nor by gold, common gold. "When", he goes on, "we combine the things and produce a compound, we call it silver, if it were white; gold, if it were red; and leaven of gold, if its sulphur content were large." In the course of the operation whenever the compound becomes white - and this happens five

times - the name 'silver' is given to it, the fifth silver being the Elixir of Whiteness. The same thing applies to gold. White and red are the two colours which the Sages are after: other colours, they consider as transitory and accidental.

Allusion 13.

Zosimos said to Euthasia: "Know that after the compound has been prepared from its ingredients, it is given one name only. It is called, say, copper, or silver, or gold, or amalgam, or lead, or magnesia; for it is composed of various kinds of substances each of which has a different name. Similarly, when the hard particles⁽¹⁾ are made to unite by moisture, only one name is given to the substance thus produced; for they are from one stone, and even if they were not, they would be after their union."

It was mentioned before, says Jildakī, what the Sages mean by copper, silver, gold, amalgam, and magnesia. There were, we remember, four coppers, similar to one another in certain respects and dissimilar in others. Amalgam is the name given to the compound at the beginning of both the first and the second operation. The name lead is given to the compound whenever it turns black, and this happens once in the first operation and once in the second.

The main thing is, continues Jildakī, that the compound may be considered as one homogeneous substance and given one

1. الاجزاء الصلبة

name, or it may be given different names on account of its being composed of various substances. "And this is one of the secrets of the Sages as regards their terminology."

And now the reason why 'the hard particles' unite when moisture is added to them is that they lose their hardness and dryness and become soft and humid.

Advantage 1.

Zosimos said to Euthasis: "The names constitute a secret, we explained. And he who uses one of them in practice commits a mistake. When they said 'Tincture the whole body', they meant redden the whole body, that is, the compound. When they said 'the art of silver', they implied whitening; and when they said 'the art of gold', they meant reddening."

'The names constitute a secret', said Zosimos, and he meant, explains Jildakī, that they are riddles or cryptic symbols, which the Sages employ to express their ideas by way of allegory. 'And he who uses one of them ...', said Zosimos, and by 'them' he implied copper, lead, silver, gold, magnesia and other bodies; and it is, of course, a mistake to understand, say, metallic copper whenever the Sages use the term copper.

Advantage 2.

Tuḡrā'ī said in K. Jāmi^e al-Asrān :

'Just as they gave to the compound and its parts different names at various stages of the operation and transformation, so they referred with diverse names to the successive processes of the one and only operation. Some of the names given to the operation are: fusion, melting, putrefaction,

coction, pounding, crushing, dissolution, powdering, volatilization, combustion, gilding (or silvering), whitening, reddening, blackening, sifting, pulverization, rusting, moistening, roasting, nursing, fondling, emaciation, generation, attenuation, cleaning, combination, mixing, ablution, bleaching, maceration, solidification, coagulation, desiccation, silvering, and successive treatments in fire. All these are included in a single operation."

Jildakī does not consider the above list of operations complete. Moreover, he says that they are not arranged in order of their precedence. The reason why Ṭugrā'ī did not mention all the necessary operations is, according to Jildakī, that in his days there were many philosophers and sages, students of Jābir and Avicenna and others, who could understand things more quickly and more easily and with the help of a few hints. But there are only a few learned men to be found 'nowadays', so that one is obliged to make one's words longer and clearer.

"And we say", Jildakī goes on, "that the first operation is pounding, then comes powdering, then roasting, then ablution, then cleaning, then crushing, then combustion, then calcination, then whitening, and then soaking. These are included in the first concealed operation which is said to be a single operation and is referred to as purification. After that comes decomposition and the first separation, then mixing, then combination, then putrefaction, then rusting, then maceration, then gilding (or silvering), then emaciation,

then the first blackening, then coction, then the second combustion, then dissolution, then the second whitening, then sifting, then ablution, then cleansing, then bleaching, then volatilization, then the third whitening, then attenuation, then filtration, then cleaning, then solidification, then coagulation, then desiccation, then silvering, then successive treatment in fire, then fusion, then melting, then projection; and if we wish we would say, then disintegration, then dissolution, then cleaning, then multiplication, then coagulation, then desiccation, then distillation, then silvering, then successive fire treatments, then fusion, then melting; and if we wish, we may add to this list endlessly. By God, O reader of this my book, you have obtained what no one bestowed so bountifully before me, and I do not think anyone will bestow after me." (1)

The rest of Jildakī's explanation with regard to the

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1. Es., Vol. III., pp. 176-7 : ونقول ان اول الاعمال الذي تم السحق ثم التشوية ثم الفصل ثم التنقية ثم الهدم ثم الحرق ثم التكبس ثم التبييض ثم التصويل و هذه متعلقة بالتدبير الاول المكتوم ويقال فيها انه عمل واحد يسمى بالتهديب ثم بعد ذلك التمييز والتفصيل الاول ثم الخلط ثم التركيب ثم التعفين ثم التصدئة ثم الترطيب ثم التموية ثم التمسحة ثم التمويد الاول ثم الطبخ ثم الاحراق الثاني ثم الحل ثم التبييض الثاني ثم النخل ثم الفصل ثم الطهارة ثم الفصارة ثم الاصعاد ثم التبييض الثالث ثم الترخيم ثم التصفية ثم التنقية ثم الاجماد ثم العقد ثم التجفيف ثم التنفير ثم تعويد النار ثم الازابة ثم السبك ثم الطرح وان شئنا قلنا ثم النقض ثم الحل ثم التنقيه ثم التضعيف ثم العقد ثم التجفيف ثم التقطير ثم التنفير ثم تعويد النار ثم الازابة ثم السبك وان شئنا اعدنا هذا لكلام الى ما لانهاية له والسلام وبالله لقد نزت ايها الناظر في كتابي هذا بما لم يسمح به احد قبلي ولا ظن ان يسمح به احد بعدى .

above quotation from Ṭuḡrā'ī is a mere repetition of his previous arguments concerning the oneness of the stone and the operation. He reiterates also his previous assertions about the duration of the operation.

Advantage 3.

Ares said in Muḡhaf al-Hayāt (The Book of Life) :

"Anything of which no weight was found, make it equal."

This is, says Jildakī, a very obscure statement and may not be explained clearly; for it concerns one of the most guarded secrets of the Art. It is similar to the statement of the author of Al-Muktasab : "It is from little and much and then becomes equal."

The Sages, continues Jildakī, mentioned the weights connected with certain stages of the operation, and they described also the constituent parts of the compound. But they made very obscure statements with regard to " the actual hidden weights which form the basis of the Art": they left these to the intelligence and the skill of the devotees and did not go beyond giving some vague and gentle hints. They said, 'Let the spirit be of the same weight as the soul', or 'Let the body be of the same weight as the spirit.' In The Books of Balances and The 144 Books of Jābir there are found plenty of similar statements concerning 'the apparent weights'. Sāhib al-Šuḡūr, on the other hand, made no

mention of the 'apparent' weights, but referred to the 'hidden' weights in his Dīwān (Collection of Poems) on several occasions. Jildakī quotes here three couplets from Ṣāhib supposed to be about the 'hidden' weights; they throw, however, no light on the matter and only add to the confusion.

Jildakī then goes on to say that the 'weights' are divided into eleven groups connected respectively with the soul, spirit, body, extraction of the soul, parts of the spirit, parts of body, 'first sal ammoniac', 'second sal ammoniac', purification, maturing, and 'the right constitution'. For further information in this connexion he refers the reader to the second volume of his present book and particularly to his book al-Taqrīb fī Asrār al-Tarkīb.

There is no doubt; he continues, that in 'the world of generation and corruption' everything is composed of the four natures. And the most important thing is to measure the amount of natures in substances. This would enable one to understand not only the secrets of the Art, but also the essentials of medicine. Hippocrates, Galen, Dioscorides, and a number of Muslim Sages described the properties and the effects of drugs. But they confined themselves to the determination of the dominant nature in each drug by examining their taste, odour, etc. They said, for example, that

"pepper is hot in the fourth (degree), salt is both cold and dry in the fourth (degree), saffron is hot in the second (degree) and dry in the first, etc."⁽¹⁾ The determination of the dominant nature of simple substances is very useful in medicine, but it is not sufficient as regards the Art. In the Art, the amount of all the four natures must be determined; for without this knowledge no stable compound can be formed;⁽²⁾ whereas in medicine it is not necessary to prepare stable compounds. The dissolution of stable compounds is more difficult than that of simple substances or unstable mixtures, and, once they have entered into the constitution of the body their removal is almost impossible.

Going back to the statement of Ares, Jildakī says that it admits of many interpretations, of which he mentions four. These interpretations of Jildakī are not very illuminating but they all emphasize the importance of establishing equilibrium among the four natures in the preparation of compounds.

Advantage 4.

The simple substances used in the operations of the Art are souls, spirits and bodies, says Jildakī. In 'External

1. See Kraus, Jābir Ibn Ḥayyān, Cairo, 1942, Vol. II., p.196.

2. A stable compound is that in which the four natures are in equilibrium.

operations' they take the form of mercuries, sulphurs, arsenics, malleable bodies, crumbly bodies, salts, boraces and the like. In 'Internal operations', on the other hand, they take the form of waters, oils, tinctures and bodies. And anyone, who could assess the amount of hot, cold, moist, and dry constituents of an External substance, would be able to establish an equilibrium among its natures and thus transform it into an Internal substance in the twinkling of an eye. (1)

"In this" (2), continues Jildakī, "lies the secret of Balances." The ancient Sages knew this secret and Jābir based his books on Balances (K. al-Mawāzīn) on it. (3) In these books he gave, by way of allegory, the names of animal organs to the substances employed in the Art. He discussed the Balances also in his books on properties (K. al-Ḥawāṣṣ) and on the seven bodies (K. al-Ajāsād al-Sabʿa). Ṭuḡrā'ī, not understanding the Theory of the Balance of Jābir, thought that it concerned the Middle Operation.

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1. This statement of Jildakī implies that External substances differ from Internal ones in that the four natures are not in equilibrium in them.
 2. I.e., determination of the amount of natures in substances.
 3. See Kraus, Jābir Ibn Ḥayyān, Cairo, 1942, Vol. II., pp. 187-303.

Advantage 5.

Animal substances, i.e., waters, oils, tinctures and earths (or bodies), like the mineral ones, may not be 'prepared', says Jildakī, unless their composition, that is, the amount of each nature in them, is known.

Advantage 6, 7.

Jildakī devotes these two sections, i.e., the 'Advantage' 6 and 7, to a 'partial' interpretation of a poem of Ṣāḥib, of which he quotes here only the first couplet. For the complete explanation of the poem, he refers the reader to his other books, particularly to Ġāyat al-Surūr. This poem of Ṣāḥib is supposed to be about 'the real weights', but there is, unfortunately, nothing either in the explanation of Jildakī or in the couplet he quotes which makes us any wiser with regard to the question of weights.

Advantage 8.

Here Jildakī quotes several couplets from Ṣāḥib supposed to be about the 'real weights' in the first concealed operation, and he refers the reader to two of his books, Ġāyat al-Surūr and al-'Iqrīb for a complete explanation of them.

Advantage 9.

The assertions of the Sages about 'weights' must not be

interpreted literally, says Jildakī. What they had in mind when they spoke of weights was, according to him, the proportion of each nature in substances, which has nothing to do with the apparent 'quantitative weights' (i.e., weights measured by the balance).

The production of the Elixir depends on two things : the removal of impurities and the establishment of equilibrium among the natures. It is with the second of these problems that the Science of the Balance is mainly concerned: to determine the proportion of each nature in substances, and to combine these, two or more of them, in such a way as to obtain an equilibrium or any desired proportion of natures.

Advantage 10.

In all the operations of the Art, says Jildakī, it is necessary to treat the hot component of the compound with something which would make it cold, the cold component with something which would make it hot, the moist component with something which would make it dry, and the dry component with something which would make it moist. This does not mean, he goes on, that the hot component, for example, should be made actually cold, or vice versa, but that the excess of each nature should be removed or be balanced by its opposite. For the excess of hotness causes combustion and prevents generation,

the excess of coldness corrupts the generation and impedes motion, the excess of moistness retards coagulation, and the excess of dryness hinders combination. It is, therefore; necessary to decompose all the ingredients of the compound, remove their impurities, and combine them in such a way as to establish a balance between the opposite natures.

Question 1.

Zosimos in his Muṣḥaf al-Ṣuwar (The Book of Forms), says Jildakī, spoke to Euthasia about figures and images. He meant the figures on the walls of the ancient temples, which are pictorial representations of the operations of the Art. Among these figures there is, according to Jildakī, one with black colour and wings, representing the simple substances used in the Art. The black colour signifies impurity, and the wings signify volatility. In the adjoining figures the wings become larger and larger and the black colour gradually turns into white. This marks the beginning of 'separation', and since at this stage the compound contains a certain amount of spirit, so the head of the figure is painted golden. The golden colour of the head spreads subsequently to all other parts of the figure and thus separation is completed. At the beginning of the second combination, the figure becomes black again while losing its wings. The black colour then undergoes a series of changes and is

finally succeeded by silvery white, the colour of the Elixir of Whiteness. In the six subsequent figures the colour of red gold gradually replaces that of silver, signifying the production of the Elixir of Redness.

But apart from the series of figures mentioned there are, continues Jildakī, other figures to be found on the walls : a lion, two elephants, 'the two fires', a horse, birds, cattle, sun, moon, stars, Jinn, etc. These represent the different stages of the operation and Zosimos talks to Euthasia about each of them.

Question 2.

Zosimos said to Euthasia : "When the things are mixed and they become red, we call them gold; and when they become white, we call them silver. The first proper operation is the transformation and mercurification of natures until they all become a single mercury. And when it is said 'Cook it and powder it until the compound becomes white like marble', know that this is a reference to the process of mercurification. And when you see it like marble, you understand that the constitution is sound. The substances combine, some with others, and the operation always consists of coction and powdering; coction is only done by fire, and powdering by water. And mercury is that which transforms all natures, kneads them, mixes and combines with them. So the proper treatment with mercury is only possible by coction and combination. And it is necessary for you to transform the bodies into water, and the water into a body, and the body into a soul which is tinctorial and penetrating. This single compound is that of which I spoke to you; it has now become a nature. Democritus gave it ten names, representing ten different compounds, for each of which he recommended a different operation. And know that these ten operations are all one."

Here Jildakī quotes from K.al-Jāmi^c al-Asrār of Ṭugrā'ī

a passage supposed to be an explanation of the above excerpt from the work of Zosimos. Ṭuḡrā'ī confirms the opinion that the operation is one, just as 'the four bodies and the seven bodies are one'. The Sages, he says, call the white body 'silver', the red body 'gold', the black body 'iron', and the ruddy body 'copper'.⁽¹⁾ They compare 'the four bodies' to the four natures, the four elements, the four humours, the four seasons, and the four quadrants of the heavenly sphere. And they compare the seven bodies to the seven planets and the seven days of the week. They spoke also of twelve bodies, comparing them to the twelve months and the twelve zodiacal signs.⁽²⁾ Balīnās, according to Ṭuḡrā'ī, discussed in his book the relation between the planets and metallic bodies, associating lead with Saturn, tin with Jupiter, iron with Mars, gold with the Sun, copper with Venus, quicksilver with Mercury, and silver with the Moon.

Jildakī now proceeds to enlarge upon the words of Zosimos and Ṭuḡrā'ī, but most of what he says is merely a repetition of his previous arguments concerning the oneness of the stone, the action of the moist part upon the dry part, etc.

.By 'mercurification' Zosimos meant, according to Jildakī,

1. It is not clear what Ṭuḡrā'ī meant by 'the four bodies'. See 'Question 3.'

2. Apollonius of Tyana. See Kraus, Jābir b. Hayyān, Cairo 1942, Vol. II., pp. 270-303.

the combination of the dry part with the moist part. The compound resembles 'marble' in colour, heaviness and brightness, and not in any other respect. By 'mercury' Zosimos meant the water of life, and not the boracic waters.

Jildakī compares the ten operations of 'Democritus' to ten roads leading to the same town. Apart from the plurality of roads, there are the speed and the means of travelling which must be decided upon: one could travel slowly; fast, on foot, on horse-back, etc. Moreover, one has to decide in which part of the town one is going to reside. All this is true of the object of the Art: there are different operations, different speeds, and almost different results, yet the purpose is always the same.

Question 3.

Ṭuḡrā'ī said in K. Jāmi^c al-Asrār: "The Sage said: 'The tinctorial bodies are, as I told you, four: copper, ābār, silver and gold'. Similarly, another Sage said: 'Mix the rust of the ten variations described by Democritus and devise for each one a separate operation.' What he meant was the single operation. Similarly, Moses, the prophet of God, peace be upon him, said: 'Take the stone called nastāris'. The ten variations are those mentioned by Zosimos, the Sage; who said: 'And know that the gum is that which solidifies the sulphur'. All other Sages subscribed to this opinion and said: 'The water of sulphur solidifies only by this gum. So mix the leaven of gold, that is, the rust, with the gum and let them coagulate and unite. Then you will find the gum transformed into gold, so cook it until it becomes purple'. As may be inferred from this statement, they kept silent with regard to the operations and combinations, or in other words, mixtures and concealed weights.

These weights are obtained by weighing and bear no relation to those of the four and seven bodies. And David, peace be upon him, made no mention in his book, called Sefārāt, of the Sages mixing qadmiyā⁽¹⁾ with its parts. This indicates that it is connected with the problem of weights and concealed mixtures. In another place it is said that 'Qadmiyā consists of two bodies, and its compounds are vinegars'. This indicates that the two bodies are one thing, and the compounds, another. It is like what we said about the four bodies and the ten variations."

Jildakī's explanation of the above passage is briefly as follows:

The statement of the Sage that the four tinctorial bodies are copper, ābār, silver and gold, has two different meanings, one apparent, and the other hidden. As to the first meaning, there is no doubt that these four 'External malleable bodies' are tinctorial: copper, ābār and gold tincture the silver; silver tinctures the copper; etc. And the purer these bodies are, the stronger their tinctorial power. Now as to the second meaning: by 'copper', the Sage meant the unflammable oil; by ābār, the compound which causes the second blackness; by 'silver' the Elixir of Whiteness or the highly tinctorial silver of the Sages; by 'gold', the Elixir of Redness or the highly tinctorial gold of the Sages. And no doubt for each of these there is a separate operation. By the 'ten variations', the Sages meant the six bodies which enter the operation (i.e., gold, silver,

1. قادميا : 'Litharge of gold and silver'. Jildakī, as we shall see, takes it to mean 'the stone'; most probably it is the same as 'cadmia', an impure mixture of oxides of base metals.

copper, iron, lead and ābār) and the four constituent parts of the stone (i.e., water, oil, tincture and generic sal ammoniac). And for each of these 'ten variations' there is a special operation. "We have exhaustively dealt with all these operations in our book called Al-Taqrīb fī Asrār al-Tarkīb." The word nastaris means white, but, Jildakī goes on, there seems to be no connexion between the statement of Moses and the rest of the passage from Ṭuḡrā'ī. Most probably the copyist omitted, by mistake, some of the words originally included in the statement ascribed to Moses. By 'sulphur' Zosimos meant the oil, and by 'gum' the pure leaven. And when the oil is mixed with the gum, the preparation of the leaven of gold is complete. The leaven of gold is compared to the rust because of its being tinctorial; and when it is cooked properly, in the manner of the Sages, it is transformed into the Elixir of Redness, without passing, however, through the state of the Elixir of Whiteness. Ṭuḡrā'ī wrongly thought that the leaven should pass through many different stages of the operation before becoming purple, and that is why he said "they kept silent with regard to the operations." By 'qadmiyā' Ṭuḡrā'ī meant the stone, which, 'as we know', consists of two bodies.

Question 4.

Hermes said : "When the Exterior of the copper whitens, the Interior of the salt follows suit. And when the

Exterior of mercury whitens, its Interior becomes white too. Anyone desirous of knowing the secret of this science should learn the secret of whitening. If you learn everything but neglect the whitening, you will destroy your nursling."

'The salt', comments Jildakī, "is necessary, and it is the key to this Art. It purifies the natural and combustive first copper. It is the prepared liquid salt which has no drags; it is the sharp water; it is the strong vinegar. And when the first copper is melted with it several times, its Exterior becomes white; this is an indication of the correctness of the operation. And just as a part of it becomes white, so the whole of it, that is, its Interior, could become white."

Ibn Wahṣiyya said in his K. al-Kanz (The Book of Buried Treasure) concerning the operation of the 'supporters of the salt' :

"Those who believe in the magnificent stone are divided into two groups. One group contends that the stone should be repeatedly volatilized, dissolved and coagulated until it becomes perfectly soft. It would then have great effects on the two leads, and would transform them into a pure silver better than the silver of the mine. The second group asserts that the stone should be cerated with the oils, vinegars, and particularly with the salt. They first cerate and liquefy it, and then volatilize, dissolve and coagulate it. But volatilization of the stone should precede its ceration. I, in fact, witnessed their work when they were performing their operation. Their vessel cracked and the vapour of the salt escaped, whitening everything it came in contact with. This happened after intensive heating by a strong fire. They were of the opinion that there is no way of getting hold of all of it. 'So we leave', they argued, 'the part which escapes and retain as much of it as possible'. Our friend Abu al-Ṭayyib al-Bayyā' (may God have mercy on him!)

became very eager at the time to perform the operation. So he erected a solid structure having a cupola and fitted, in the middle, with a tābištān,⁽¹⁾ in which he lighted the fire to heat the salt. After a continuous and intensive heating, for one day and one night, he obtained from two rdtls of Ray⁽²⁾ of the salt five dirhams of molten sediment. From the vapour which collected in the cupola and (escaped through) the open aperture nothing could be obtained; for it permeated everything it passed by and completely whitened an apparatus made of iron which happened to be near by⁽³⁾. But I saw a man who belonged to a third group. He cerated the mineral salt after having purified it with volatile oils, volatile naphtha and volatile olive oil. And I saw another man who contended that the salt could not be cerated with oils incongruous to its nature. There is, he said, a secret in it; and if you learn that, and prepare the salt from its essence, it will yield to ceration and melt quickly like wax. His method was to take the white salt called andarānī (?), reduce it to a fine powder and foster it, in a mortar, with pure water until it became plastic. It was then made into a ball, wrapped tightly in a linen cloth, covered with the clay of the Sages, dried and placed in a hot oven or the stove of the bath for one night. The processes of powdering, fostering with the water, wrapping, plastering and heating were repeated three times. After that it was powdered in the mortar, placed in the crucible and heated. This was the prepared salt which melts, like metallic bodies, in the fire and can be poured into a mould. One of the strange things I noticed about this salt was that, when I melted it, it flowed out of the crucible. I thought the crucible had cracked or broken, so I took it off the fire while the salt was still flowing out of it. But when I cooled and emptied the crucible, I found it intact. So I returned to the operation, having learned that the salt is so fine that it flows out of a perfect crucible, through which neither water nor air, nor any molten body could pass. In short, make a crucible, smooth like glass,

1. طابستان ?

2. An old city of Persia which was situated in the vicinity of Teheran.

3. This appears to be an experiment in which a deposit of ferrous chloride is formed by the action of hydrochloric acid on iron.

and solid like iron; the prepared salt, when melted, will infiltrate through it." (1)

The salt to which Ibn Wahšiyya refers, says Jildakī, is a constituent part of the stone. But, he goes on, the salts, considered as such, even after they have been prepared and made to melt like metallic bodies, do not combine with the latter. For not every fusible substance is capable of combination. Glass, for example, melts like metallic bodies, but it does not combine with them because its soul is dry and its oiliness insufficient. Similarly, crumbly bodies, because of their excessive dryness and the absence of an adequate amount of adhesive oiliness and moisture in their constitution, enter into combination with great difficulty. The important point is that the salts are employed in the Art for the sole purpose of purification and whitening; "and that is why the Sages insist upon the use of the sharp water, which is the master key to the operations of this Art." For the complete understanding of the secrets of 'prepared salts' Jildakī refers the reader to his book al-Taqrīb. He then returns to the explanation of the words of Hermes quoted above.

"When the Exterior of the copper whitens, the Interior of the salt follows suit," said Hermes. He was referring

1. Es., Vol. III., pp. 212-15.

to 'the first half of the concealed operation', and though a superficial interpretation of his words would convey the impression that 'copper' and 'salt' are two different things, one should remember that they have a common origin. The salt is the product of the calcination of the 'first stone' in the first concealed operation. The sharp water or the strong vinegar is derived from the salt, and the 'first red copper', so essential to the first combination, cannot be whitened without it. This is the salt concerning which one of the Sages said: 'O seeker, here is the salt, prepare it : it is the basis and the most important of all their calces.' And another Sage said : "Powder the salt, place it in a mug of porcelain, seal the joints, and heat it in an oven for three days and nights until it whitens and dissolves in its moisture." And a Shah said to his son : "O son, take from the generous and combustive stone as much as you wish, and take one third or, if you can, half its weight of the volatile moon, powder the salt together with the fresh and moist moon on a grind-stone until it becomes a body. Then place it in an iron pan and heat it upon a blazing charcoal fire and stir it until it becomes red, then black, and then white. And when it becomes white, you know that calcination has taken place. Repeat the operation three times until it becomes as white as ceruse. After that, place it upon the

grind-stone and pound it well, and then heat it in the fire until it melts. Take it off the fire and use it; it is the calx to which the Sages referred.' His son asked: 'O father, would it damage the salt if the vessel in which it is contained is left open?' The Shah replied: "That is beneficial to it. If the vessel is left open, the salt becomes whiter and the speed of operation increases." "The purpose of calcination", remarks Jildakī, "is not to take something away from the salt but to purify it and remove its blackness. In fact, it acquires hotness and acridity from the fire, and when it is subsequently projected into the water, it transfers these qualities to the latter, making it pungent. Thus it acquires power from the fire and delivers it to the water. It is like the flint-stone, which when struck, gives away some of the fire hidden inside it."

After quoting a poem from Khalid, two poems and a couplet from Ṣāhib concerning the properties of the salt, Jildakī goes on to explain the remainder of the quotation from Hermes.

"And when the Exterior of mercury whitens, its Interior becomes white too," said Hermes. He was referring to the 'second half' of the concealed operation where the dry part of the stone combines with its moist part. In this connexion, Jildakī quotes, for the second time, a passage from the second

section of the second part of Al-Muktasab, 'on the manner of the preliminary part'. Subsequently, he quotes a lengthy passage from K. al-Nuhās (The Book of Copper), part of the collection called Kutub al-Ajsād al-Sab'ā (The Books of Seven Bodies) of Jābir. The following is a summary of the passage in question.

Jābir: "The copper is half-way between silver and gold", and it combines with both of them. Verdigris is produced from copper and is widely used by people for the purpose of dyeing. Copper and sal ammoniac are indispensable to the Art : without them there will be no tincturing, no ceration, no partial and total combination. Some of the philosophers said the same thing about mercury, which no doubt exhibits wonderful properties. Mercury is a tinctorial soul; its Exterior is white, soft and moist, and its Interior, red, hard and dry; it softens the dry and whitens the black. The Sages associate it with the planet mercury; for like the latter "it is male with the males, female with the females, diurnal with the diurnal, nocturnal with the nocturnal, moist with the moistness, and dry with the dryness. It changes the colours, incites the souls to return to dead bodies, reviving them after death, rousing them to action after exhaustion, setting them in motion after rest, and volatilizing them after precipitation."

Jābir then goes on to describe, according to Jildakī, the
 'preparation of copper with rāsuht,⁽¹⁾ sal ammoniac and other
 drugs": 'This is what the Sages meant when they said, 'Prepare
 the stone from it and with it'. They were referring to the
 preparation of mercury, and, in the name of my master,⁽²⁾ all
 people considered this to be impossible and false. I
 contend, in the name of my master, that it is true; and if you
 perform the operation for yourself you would think likewise :
 experiment will reveal to you the reality. Take the mercury,
 place it in a clean aludel of porcelain or glass, pour sweet
 water on it and suspend the vessel upon a gentle fire until
 half the water evaporates. Then leave it until it cools,
 pour out the remaining cold water and add fresh water, heat it
 with a gentle fire until half the water evaporates. Then again
 leave it until it cools, pour out the cold water and add fresh
 water, heat it for one night. Repeat this operation for
 many days until in the end a dry, white and solid stone is
 formed, resembling beryl." Jābir then says that Plato
 ascribed a similar opinion to Socrates, concerning the effect
 of the water on mercury; and also, Porphyry said that,
 according to Walis I, similar views were expressed by
 Andromaches I, the ancient Hebrew.

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1. راسخت (Persian) : 'antimony; native cinnabar'.
 2. Ja^efar al-Šādiq, the sixth Imam of Shi^ea sect.

Jildakī now proceeds to comment on the words of Jābir and to finish his explanation of the quotation from Hermes, but he sheds no light on the subject.

Question 5.

"Our lord David, peace be upon him" , says Jildakī, " said in his Sifārāt : 'The most important part of the whole operation is whitening with this moisture - and its extent. This moisture is used to whiten and redden all sorts of things; it is the white stone. I have, indeed, divulged the secret, I beg pardon from God! "

Jildakī's explanation of the words of 'David' is ambiguous, unintelligible, and consists mainly of a chain of enigmatical dicta to which he had referred several times before. He invokes the authority of Hermes, Jābir and Ṭuḡrā'ī with regard to the question of whitening. He refers the reader to his own books al-Ġusl wa al-Tanqiya and al-Taqrīb, to al-Tanqiya and Ṣahīfa⁽¹⁾ of Jābir, and to Maṣābiḥ al-Hikma wa Mafātīḥ al-Rahma and Ḥaqā'iq al-Īstīshād of Ṭuḡrā'ī. He praises the latter and considers him as the greatest of all the alchemists who came after Jābir. But he repeats his previous criticism of Ṭuḡrā'ī, saying that though well versed in theory, he was weak in practice. This remark

1. These two books are not included in the list of Jābirian writings given by Kraus.

applies just as well to Jildakī himself.

Question 6.

"Zosimos said in Mushaf al-Şuwar in the course of a dialogue with Euthasia : 'When the water of sulphur is mixed with bodies and then solidified, it becomes unflammable and stable; and thus the tinctures are prevented from volatilization. For the sulphur mixes with the sulphur, and the moisture combines with the moisture congruous to it. I pointed out to you that bodies are (from) two waters. So do not suppose that there is only one water: there are two moistures. One of them is a gum, and the other, mercury; the former solidifies, and the latter, whitens.' "

By 'mercury', according to Jildakī, Zosimos meant the soul, and by 'water of sulphur' he implied the unflammable oil, i.e., 'the second copper', the like of which cannot be found in the world. Mercury, that is, the soul, protects the water of sulphur from the heat of fire, makes it stable, prevents the destruction of its tincture, and makes it penetrate bodies. The water of sulphur, on the other hand, coagulates the mercury, prevents it from volatilization, and transforms it into a pure gold capable of combination with malleable bodies.

Here Jildakī gives another quotation from Zosimos. According to the latter, when the red colour appears earlier

than it normally should, one has to place the compound, together with 'ears of silver', in a vessel and heat it for 41 or 50 days until it becomes 'marbly black'. One could then proceed with the rest of the operation.

Jildakī enlarges upon the words of Zosimos and speaks about the right order of the change of colours; the successive stages of the operation; the decomposition of the stone into the four natures; the material, formal; efficient and final causes; the properties of the Elixir; and the danger of interpreting the words of the Sages literally. "Even great philosophers, such as Ibn Sīnā, Hunayn b. Ishāq and Abū Raihān al-Bīrūnī" did not remain immune from this danger.

Cause 1.

The material cause of the Elixir.

The Sages, says Jildakī, gave to the Elixir the names 'stone', 'egg', and 'prime matter', each of which has a special significance. "Matter is that in which the prime matter exists potentially. Prime matter is that in which the Elixir exists potentially and, to some extent, actually." Jābir, continues Jildakī, gave the name 'stone' to the genus of minerals and thus "referred to the general while meaning the particular". As to 'the egg', it is that from which the nursing of the Art originates. It consists of three parts :

soul, spirit and body. It requires treatment, just as the ordinary egg requires heat in order to putrefy and transform into chicken. And just as the egg cannot develop into anything else except chicken, so the prime matter cannot transform into anything but the Elixir. Yet the matter from which the prime matter is derived may or may not develop into the Elixir. So the Sages sought to obtain an essence which would easily receive the form of the Elixir, just as iron, particularly 'pure iron', i.e., steel, receives the form of sword or knife. It shows a lack of intelligence to try to transform lead into steel and then make a sword from the steel thus produced. Lead can of course be made hard, but develops into something between iron and copper and not into either of them completely. Therefore, though lead is purer than both iron and copper, and can be made into a sharp sword, yet if we are interested only in an iron sword, there is no use in hardening the lead. And the purpose of the Sages is to produce the Elixir and not something similar to it.

Cause 2.

The formal cause of the Elixir.

The material cause, we learned, says Jildakī, is 'the potential essence of a thing'. For example, wood is the material cause of the throne, and a line that of the

circumference of the circle. Now, the formal cause of the throne is its structure, and that of the circle its circular shape, resulting from the combination of line and surface. The student of the Art must investigate the material cause on two occasions : first, before the transformation of the matter into the prime matter capable of receiving the form of the Elixir, and secondly when this transformation takes place. Similarly, he must inquire into the formal cause of the matter, the prime matter, and the Elixir.

Cause 3.

The efficient cause of the Elixir.

The agencies which effect the imposition of the form of the Elixir upon the matter are six:

1. The apparatus used in the Art, such as stone-pestle; grind-stone; ⁽¹⁾ amyā, made in imitation of the hollows of the earth and employed for generation; the instrument called 'the ladders of gold'; ⁽²⁾ alembic; aludel; cupping glasses; bottles; receiving flasks and the like.
2. The moisture called 'soul' or 'mercury', which is the efficient cause of calcination, decomposition, natural dissolution, separation of the subtle from the gross, penetration into the interstices of

1. عمياء : a spherical vessel made of two hemispheres fitting closely together.

2. سلاسل الذهب

metals, stability in the fire and perfect combination. From this moisture is derived the 'western mercury', that is, the 'soul of the stone'; and also the 'eastern mercury' which is the 'spirit of the stone'. 3. The 'oily moisture' called 'spirit'. It is hot and moist and transforms the cold and moist soul into a hot and moist oil. 4. The generic sal ammoniac which coagulates the water by its hotness and acidity, strengthens the spirit by its sharpness, refines the particles of the earth by its subtlety and fluidity, and reconciles the soul with the spirit by its viscosity. 5. The stable earth which fixes the volatile substances. 6. The fire, which is divided into four kinds: the fire of putrefaction, the fire of distillation, the fire of sublimation, and the fire of projection.

Cause 4.

The final cause of the Elixir.

The final cause is closely associated with the effect, says Jildakī. Before the realization of the effect, he goes on, it 'only exists in the mind' and has no material manifestation. Nevertheless, it precedes the effect and constantly influences the course of the development of the thing until the state of perfection is reached. The effect is generally intrinsic to the cause. For example, death is the inevitable result of slaughter, or diarrhœa the unavoidable consequence of

consuming scammony and yellow myrobalan, etc. But the relation between the cause and effect may also be accidental, one such example is the discovery of a treasure while digging the ground.

The final cause of the Elixir is very noble; for the acquisition of the Elixir means unlimited wealth and eternal power. "We mentioned at the beginning of this book," says Jildakī, that no branch of philosophy, except the science of the talisman, which enables one "to dominate the worlds by the subjection of both heavenly and earthy souls", is nobler than the Art. In this connexion Jildakī quotes three verses from the Koran and tries to interpret them in such a way as to support his argument concerning the genuineness of the Art. The terms 'science' and 'philosophy', which appear in the above-mentioned verses of the Koran, he takes to mean 'alchemy.' He quotes Rāzī, 'the pupil of Jābir', as having said that no one could call himself a Sage without having produced the Elixir. He also invokes the authority of Jābir with regard to the wonderful properties of the Elixir. And finally, he contends that an important condition of achieving success in the Art is to be pious and godly.

Purpose 1.

Here Jildakī deals with the 'status and dignity of the

Art'. The Sages, he says, referred to the Art as the 'Middle World', distinguishing it from the 'Upper World', i.e., the world of the heavens or the 'Great World', and the 'Lower World', i.e., the world of man or the 'Small World'. Stationed in the middle of the upper and lower worlds, the world of the Art embraces all the mysteries in both of them. Thus the Art comprises every kind of knowledge, be it concerned with the properties of the substances of the mineral, vegetable and animal kingdoms or with the revolution of the heavenly spheres.

Jābir, continues Jildakī, testified in many of his books, to the greatness and the glory of the Art, and Rāzī devoted 'one of his twelve books' to this subject, i.e., the importance of the Art. All this evidence points to the fact that there lies in the Art the secret of prosperity in this life as well as in the life to come.

After repeating his previous account of the history of the Art, Jildakī argues that it is 'lawful' to derive pecuniary advantages from the Art, provided that most of the fortune thus accrued is spent on relieving the poor and curing the sick.

Purpose 2.

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The Monk said : " Heat it and volatilize it in the

1. الراب : See Kraus, Jābir b. Hayyān, Cairo, 1943, Vol. II., p. xxxvii.

alembic, throw the sediment away, pound the fire, wash the water with the water, make the vessel secure and guard against the wind and the smoke, encircle the Circle with the circle, use your brains, lose not your patience if coction and putrefaction take long to complete, show no weakness and cherish no grief, continue the operation until all the water congeals and stops running away from the fire. Train the water in the course of coction and putrefaction to wage war against the fire by sealing the top end of the vessel. Deposit the flask in damp manure for a month until the water reddens and coagulates and the calx becomes red like minium. There is no other red calx in the world save this one."

The Monk said 'pound the fire' and by 'fire' he meant, explains Jildakī, the constituent part of the stone known under that denomination. He said 'cleanse the earth' and he meant whiten it.⁽¹⁾ He was right to recommend the sealing of the vessel; for otherwise the 'generative soul' would fly away, and moreover, the air would enter the vessel, hindering putrefaction and corrupting the compound. He said 'encircle the Circle with the circle' and he meant one of two things :
 (a) guard the vessel against the vicious intentions of jealous

1. Jildakī does not explain what the Monk meant when he said 'wash the water with the water'.

people; (b) encompass the vessel with strong belts in order to prevent its sudden break.

The rest of Jildakī's explanatory remarks shed no light on the words of the Monk.

Purpose 3.

"Jamāsf, the Persian learned man from whom his countrymen derived all their sciences, said: 'If you make the fire gentle, the poison will enter the heart of the mixture which they call magnesia, and thus you will attain your object. Continue in this manner until the end is reached. This is the mixture on which the success of the operation depends. It is a single compound in which, besides the natures, gold and silver are present potentially; for if it were not so, no gold or silver could be obtained from it. We are not referring to common gold and silver, but to things far better than them, just as the living is better than the dead'."

When, explains Jildakī, the volatile soul undergoes putrefaction, it transforms into a poison and penetrates the inmost recesses of the compound. It is in the first compound that gold and silver are present potentially : in the second compound their presence becomes actual.

Purpose 4.

Zosimos said to Euthasia: If you want to mature the compound place it in a glass container in order to prevent the exudation of the natural moisture. Then mix the moist part with the dry part so that the latter exchanges its soul for the spirit of the former. Repeat the operation several times

until the dry part is transformed into a tinctorial soul.

Jildakī's explanation is briefly as follows:

Zosimos recommended the use of a glass container in order to prevent the escape of the subtle parts of the compound. Glass-making is one of the branches of the Art and constitutes a 'manifest proof' of its genuineness. Glass is made of hard, dry and earthy particles, i.e., sands, and other substances which abound in moisture. The Sages in their quest of containers which could give complete protection to their compounds turned, first, to earthenware vessels made of clay. But they found that these were not proof against either water or air. Therefore, they all agreed upon the dissolution and subsequent solidification of sands and hard stones, which, because of the extreme fineness of their pores, do not allow the air to pass through them. In trying to put their idea into practice, they realized that the action of fire, though essential, was not sufficient. To assist the fire, they turned to 'accidental moisture' for the dissolution of sands. They employed solvents like qily which 'fuse and flow' in the fire. They placed layers of wood, sands and 'the drug' on top of one another and then set fire to the wood. The fire melted 'the particles of salt and the drug' and these in turn dissolved the sands and the stones, forming a

transparent, homogeneous substance. This, after the extinction of fire, was taken out of the furnace and broken into pieces. Then came the second fusion, in the course of which the dyes were added. From the tintured, molten glass thus produced different kinds of apparatus were made.

There are, continues Jildakī, drugs which when added to the molten glass, whiten it and purify it completely; and that is how crystal glass is made. There is a resemblance between the making of glass and the production of the Elixir. In both cases fire is employed and there is a moist part which acts upon a dry part. Glass of good quality is easily mistaken for precious stones; they differ only in heaviness and 'properties'. In fact, when the Elixir of Redness is projected upon a crystal glass of good quality, ruby is formed. But red dyes do not produce the same effect on the glass as the Elixir. "I once met a learned man who said he melted crystal glass and tintured it, imitating the colour of ruby. From this glass he made gems which he sold at the jewellers' market in Egypt and procured great wealth. He then got the gems back and broke them and returned to the people their money and confessed that the gems were artificial."

Problem 1.

Zosimos said: "This water is, indeed, very volatile in the course of ablution, combination, coction, whitening and

reddening, but its volatility increases during its combination with mixtures of its own nature. After having been mixed with these, it congeals and becomes a single substance, sheltering its friends in its interior. And when it is subsequently subjected to coction, it performs its function perfectly, leaves behind the tincture contained in it, and volatilizes."

Ṭugrā'ī said, explaining the above quotation from Zosimos: "It is, indeed, volatile, but it later becomes stable and tinctorial. That is why Mary said, 'Whenever it enters, it becomes stable.' We ought to agree with the opinion of the Sages that it is volatile, but we declare that the volatile part of it is its coarse part: its soft part and its soul, which contains the tincture together with other mixtures, are stable."

In his explanation, Jildakī rejects the argument of Ṭugrā'ī, saying that the latter did not understand the true meaning of the words of Zosimos. "The Sages", he says, "recognize three grades of water. We can say there is only one water, or there are two or even three waters, just as we wish." These waters, he continues, are indispensable to the success of the Art, and the Sages referred to them in enigmatic terms, guarding them like hidden treasures. The statement of Zosimos that 'This water is, indeed, very volatile', holds true in respect of all the three waters, first, second, and the third.

The first water penetrates the interstices of the stone, mixes with its particles and, after having purified and whitened it, volatilizes, leaving nothing behind in the stone. To this water Jābir referred in a number of his books, such as K. al-Arkān (The Book of Bases), where he called it 'the twig of myrtle'; K. al-Zībaq al-Ġarbī (The Book of Western Mercury), where he compared it to the soul; K. al-Aḥsād al-Sabʿa (The Book of Seven Bodies); K. al-Malik (The Book of the King), where he called it 'the sea physician'; K. al-Rahma (The Book of Mercy); K. al-Ḥawāṣṣ (The Book of Properties); and Kutub al-Mawāzīn (The Books of Balances). "We gave comprehensive hints with regard to this water in the first and second volumes of our present book." Ṣāhib also referred to this water in his poems. The first water is used in all operations of the Art, particularly in the Major Operation, in the whitening of the 'black earth' and in the purification of the oil. It has a 'rectifying' effect on every corrupt substance and is similar in this respect to the 'water of salt'.

As to the second water, Jildakī goes on, it is derived from the stone; it is the soul of soul; it assists decomposition, dissolution, and consequently, putrefaction; it is the 'soul of the first gum' and the cause of the first

combination. It is volatile, evaporates and condenses, but it never becomes stable.

The third water is intrinsically volatile, and even after its combination with a body, it cannot be said to have become stable. For it is transformed into the essence of the body with which it combines, just as food is transformed into the essence of man. Avicenna and many others failed to understand this.

So we see, argues Jildakī, that Ṭuḡrā'ī was not right in saying that 'it later becomes stable'. His reference to the statement of Mary is a mere blunder; for that statement was made in connexion with a completely different problem and has nothing to do with the water. More serious is Ṭuḡrā'ī's mistake in ascribing volatility to the coarse part of the water, and stability to its soft part. This is at complete variance with the established view of the Sages. Jildakī vigorously criticizes Ṭuḡrā'ī, saying that it would have been much better for him if he had remained silent and made no attempt to interpret the words of Zosimos when he did not understand them.

There are, continues Jildakī, three ablutions, three combinations and three putrefactions in the whole operation. As to coction (or maturing), it is a name which is sometimes given to putrefaction - this is the sense in which Zosimos

employed the term -, but generally it is used to imply the whole operation from the beginning to the end.

Problem 2.

"Our master, Hermes, peace be upon him, said : 'The bases are the four natures; from them all things originate and to them they all return; philosophy is based upon them. The first element to originate from the natures was earth, the mother. Then water, being closely related to the earth - they are both cold - entered into it, dissolving and putrefying it completely. Then air, being closely related to the water - they are both moist - entered into the earth and water, animating every bit of them. Then fire entered into it and dominated the earth, the water and the air, maturing all their parts. And anything originated from these four natures may be transformed into its like, i.e., into another thing having the same nature and included in the same genus.' "

The Sages believe, explains Jildakī, that the four natures are, by natural necessity, at the basis of the world of generation and corruption. If there were no change in the composition of things, that is, if there were no motion or interplay of maternal qualities, there would be no corruption, only generation. But since there is motion, generation and corruption constantly follow one another. Heat and moisture are the natures of life or generation, dryness and coldness are the natures of death or corruption. And when the natures of life combine with the natures of death, their union lasts only for a limited length of time, after which corruption sets in and the compound decomposes

into its original constituents, the four natures.

From the four natures, continues Jildakī, originate the four elements, namely, earth, water, air and fire. The Sages in their operations follow the example of Nature. They compare the fire to the spirit (i.e., the tincture and the like); the air to the oil and the like; the water, to the soul (i.e., the divine water and the like); the earth, to the generic sal ammoniac, to the whitened earth, to the new body and to the body of the Elixir.

Problem 3.

"Our master, Hermes, peace be upon him, said : 'Dryness, that strange thing which contains no moisture, seizes the moisture. Actually, it seizes and is seized, it grips and is gripped. For the air is from it and, therefore, there is a close relationship between them'. He also said : 'There is an important secret in the water and that is this : wine comes from the vine, olive oil from the olive, gum from the turpentine tree, and different fruits from different trees.' "

It is clear to all Sages, explains Jildakī, that there can be no life unless the adhesive and fluid moisture permeates the body, and that the continuous presence of this moisture in the body is achieved only when it is seized and held tight by the dryness. But dryness cannot exert a firm grip on moisture, or vice versa, without the assistance of fire. For moisture, running away from the heat of fire, takes shelter in the interior of dryness. Then, if the

action of fire is allowed to continue, dryness, on account of its close relationship with fire, will reconcile the latter with the moisture, and the three natures will thus unite together.

It was stated before, Jildakī goes on, that everything in the world of generation and corruption originates from the four natures. Now, what are the actual conditions under which a particular metallic body is formed in the mine and not the other? This question, maintains Jildakī, cannot be answered satisfactorily. For if we say, he argues, that, for example, gold originates in India because there the climate is temperate, the critic would draw our attention to the fact that gold is also found in the land of Takrur, in Egypt and other places. The same thing is true of other metallic bodies. Often a copper mine is found in the vicinity of a silver mine, the two sites being separated by only the quarter of a degree, or even less. Similarly, copper, silver and the two leads are found in proximity to one another in Europe.

As to the plants, it is well known, Jildakī continues, that different kinds of trees, bearing different kinds of fruits, with different smells, tastes and constitutions,

1. "The name given to the population of negro stock which inhabits the greater part of the low lands of Senegalese Fūta and the larger part of Bundu." See The Encyclopaedia of Islam, London, 1934, 4, 632.

grow in the same orchard, are watered with the same water and reached by the same breeze. Therefore, the Sages rightly admitted their inability to explain the reason for the existence of different species of plants and minerals. The secret of generation is not completely known to them and it never will be : it is beyond human intelligence and understanding.

End 1.

The Sages, says Jildakī, studied the primary and secondary causes and came to the conclusion that every individual, every species and every genus in the Lower World is governed by spiritual forces emanating from the Upper World. The authors of these forces, which influence and stir the natures and the elements, are sublime spirits commonly called angels. And everything in the Lower as well as in the Upper World has its origin in God, the Ever-present.

Every individual in the three kingdoms, Jildakī continues, is influenced by the seven planets, which, in turn, are governed by the fixed stars. The sphere of the fixed stars is called kursī⁽¹⁾, and the sphere beyond it, 'arṣ⁽²⁾. Beyond the nine celestial spheres there is the timeless, spaceless and imperceptible expanse in which the power of God resides in its pure form.

1, 2. See Encyclopaedia of Islam, London, 1927, 2, 1156.

After learning all this through scientific research, intuition, and the teachings of prophets, particularly those of Hermes Trismegistos or Idris, ⁽¹⁾ the Sages applied themselves to practice and tried to make actual what was potential. So they collected drugs and medicines congruous to each planet and combined them in proper proportion at the time of the planet's setting. They obtained satisfactory results, but decided to make their pronouncements obscure so that only those worthy of the Art could understand them.

End 2.

"Consider, O brother, how the Sages associated the sun with gold, moon with silver, Saturn with lead, Jupiter with tin, ⁽²⁾ Mars with iron, Venus with copper, and Mercury with mercury." If the bases of these comparisons are understood, argues Jildakī, the 'guarded secret' of the Sages will be solved. So, he proceeds to explain the 'concealed secret', saying that he did not wish to hide any part of his knowledge from the reader. He declares that he revealed in his books all that he knew, but since, 'the sea of knowledge is boundless', he should not be expected to know and to explain everything.

1. Muslim writers unanimously insist that Idris is the Biblical Enoch.

2. انك

1. Gold is associated with the sun for the following reasons: (a) Sun is situated in the fourth sphere which is in the middle of the seven spheres. It occupies the same position in the heavens as the heart in the body and a king among his soldiers. It radiates light, upon which the existence of every creature depends. Similarly gold occupies the central position among the metallic bodies; it has a balanced and perfect constitution and is more valuable than the rest. (b) On the basis of this similarity between the sun and gold, the Sages performed various operations, some of them confined to the domain of the Art, others concerned with the talisman; and they obtained satisfactory results, thereby proving the truth of their original assumption. (c) No other metallic body can possibly claim the same status as gold and compete with it in its association with the sun.

But there is a difference between common gold and that of the philosophers. For the following reasons the similarity between common gold and the sun is metaphorical, whereas the similarity between the latter and the philosophers' gold is virtual: (a) The sun is hot and dry, so is the philosophers' gold. Common gold is hot, moist and temperate, that is, it has the nature of Jupiter. (b) The philosophers' gold possesses an extra amount of 'light' which it imparts to other bodies, just as the sun bestows its light upon the moon.

Common gold, on the other hand, has no extra light to impart to other bodies: "its light is in proportion to its bulk."

(c) The philosophers' gold, when applied three times to the eyes of a person suffering from a continuous flow of tears, cures him; if an eyelash is plucked with a pair of tweezers made of the philosophers' gold, it will grow no more; if a plate of philosophers' gold is placed on the heart of a person suffering from palpitation, he is sure to recover; and if the philosophers' gold is dissolved and drunk, it will cure atrabilarious diseases. Common gold exhibits none of these properties, but if it is transformed into the philosophers' gold by operation, it will act in the same way as the latter. The sun resembles common gold when at its apogee, and the philosophers' gold, when at its perigee. The Sages have not much use for common gold in their operations.

2. Silver resembles the moon in light and colour; they both are white, feminine and deficient in heat. But again there is a difference between common silver and that of the philosophers. The similarity between the moon and common silver is metaphorical, whereas the similarity between the former and the philosophers' silver is virtual. For:

(a) the philosophers' silver, like the moon, possesses an extra amount of light which it imparts to other bodies;

(b) common silver has no extra light - its light is in

proportion to its bulk; (c) common silver contains a small amount of impurities, that of the philosophers has none; (d) the philosophers' silver cures 'hot fevers' and its solution in the wine of the date constitutes a remedy for atrabilarious diseases, whereas common silver exhibits no therapeutic property.

The Sages are not unanimous with regard to the predominant natures of silver. Some of them say that it is cold and moist, others, that it is cold and dry. Jābir thought that it is cold and dry because its exterior is the interior of gold. But there are two kinds of gold, and the actual fact is that the philosophers' silver is cold and moist, and common silver, cold and dry, the former exhibiting the qualities of the interior of the philosophers' gold, and the latter, those of the interior of common gold. This is, in fact, what Jābir meant, but it is impossible for one to understand his intentions, if one is not "worthy of being called his brother." When the moon is passing through the crescent phase, half full and gibbous, it resembles common silver, but when full, it represents the silver of the philosophers.

3. Lead is associated with Saturn on account of its dusky colour. Saturn is less luminous than other planets, and lead is less shiny than other metallic bodies. Saturn represents common lead when at its apogee, i.e., when it is

feeble and dull, and it represents the lead of the philosophers when at its perigee, i.e., when it is strong and bright. Philosophers' lead is hot and moist, that is, it has the nature of common gold, but its hotness exceeds the latter's while its coldness is too meagre.

Now if a certain amount of the philosophers' silver is added to the philosophers' lead and the resulting mixture is then combined with the gold of the philosophers, the pure, purple gold will be produced. And if common lead is mixed with common silver and common gold, the gold of legal fineness will be obtained. The secret of success in these two operations lies in the theory of the Balance and the manner of smelting "fully described in our book al-Taqrīb."

Like Saturn, lead is generally taken to be unlucky, but in certain circumstances they could be considered auspicious. When Saturn has a direct motion, or is "at the limit of its house and exaltation," it is auspicious and represents the white lead. It is most auspicious at the end of its direct motion, when it represents the red lead.

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4. Tin is compared to Jupiter, because, like the latter, it is hot and moist. The association of common tin with Jupiter is metaphorical, whereas its association with

the tin of philosophers is virtual. Though common tin is hot and moist, that is, it contains the natures of life, it has not a balanced and temperate constitution like Jupiter. That is because it is afflicted with one or more of the seven diseases, which are: "creaking, rustling, yellowness, blackness, blueness, laxity, and stinking." The nature of Jupiter and that of the tin of philosophers is free from all these diseases. Jupiter represents common tin in its 'falls', and the philosophers' tin, in its 'exaltations'.

5. Iron resembles Mars more than any other of the three remaining bodies, for it is hard and dry. The resemblance between common iron and Mars is metaphorical, and that between the latter and the iron of philosophers is virtual. Mars represents common iron in its 'falls', and the philosophers' iron, in its 'exaltations'. The sword made of the philosophers' iron, i.e., pure steel, is so flexible that it can be bent to reach its handle without breaking, and it can be made so sharp as to cut the hardest things in the twinkling of an eye. When mixed with silver, the philosophers' iron transforms the latter into gold; and when mixed with gold, it acquires all the qualities thereof. The process of the purification of common iron is described "in our book al-Taqrīb." The name Mars is applied also to a

number of other things, such as generic sal ammoniac, the garland of victory, a constituent part of the stone, and, in short, any substance which strengthens fire.

6. Of the two remaining metals, copper and mercury, the former resembles Venus more than the latter does. Were it not for its redness and dryness, copper would be nearer than other metallic bodies to silver. Copper melts because of the presence of 'hidden moisture' in it; its fusion is very much like that of silver. The comparison of Venus to common copper is metaphorical, and to the copper of the philosophers, virtual. Common copper is red. The philosophers' copper is white, it melts easily, and, since it contains incombustible oil, it mixes with silver, forming a perfect and permanent union. Venus represents common copper in its 'falls', and the copper of the philosophers, in its 'exaltations'. The philosophers' copper is the white oil which facilitates the melting of all bodies and purifies them. It also teaches the souls how to resist the fire. Venus in its first 'house', i.e., in Taurus, is auspicious and noble, representing the pure, shadeless copper, that is, common copper which has been whitened, purified completely, and made free from diseases of "blackness, greenness, yellowness and stench." It is more auspicious in Libra, representing the copper which 'carries' with it the pure tincture and the pure oil. And when Venus

is in its 'falls', or has a retrograde motion, it is unlucky and represents the common silver which has been prepared by wrong methods and 'carries' corruptive tinctures.

7. There remains mercury, which is not actually a body: it is of the genus of souls. When it is mixed with bodies, it becomes a body; when it is mixed with souls, it becomes a soul. So, because of its great mobility and its quick transformation from one form into another, it is compared to the planet Mercury. When Mercury is in its 'exaltations', it is auspicious and represents the philosophers' mercury, which, on coagulation, attains perfection and transforms into the Elixir. In Gemini also, Mercury is gentle and auspicious: it represents the philosophers' mercury extracted from "the soul of the two gums and the eternal water." The eternal water is that which penetrates the innermost recesses of bodies and extorts their souls and spirits.

Mercury combines with lead, tin, copper, silver and gold of the Sages, forming valuable compounds. But when metallic bodies are impure, no benefit is derived from their combination with mercury. From the compound formed by the combination of pure mercury with the philosophers' gold and pure unflammable 'oil of sulphur', an 'essence' can be derived which is very much like the Elixir in appearance and in tinctorial power.

(1)

"If you say to us that red vermilion is produced by the coagulation of mercury with the vapour of sulphur, and that from these two, in spite of their being impure, it is possible to derive a good extract which tinctures silver and combines with gold, we would declare that this is a difficult operation. For unless the combustible particles are removed and the small (part) is separated from the large (part) no satisfactory result can be obtained. If sulphur is allowed to burn mercury completely, only black vermilion is produced, from which no benefit is derived." The difficulty with this operation is, continues Jildakī, that it fails more often than not, and that is why the Seges do not pay so much attention to it.

Jildakī associates each alloy of mercury with a particular position of Mars in its orbit. For further information concerning the amalgams, he refers the reader to his book al-Taqrīb.

End 3.

"Concerning the uses and the properties of the Elixir."

The Elixir, says Jildakī, reanimates metallic bodies

1. α Hg S

2. α' Hg S

after death and rectifies them after corruption.

One part of the Elixir of Whiteness, he continues, is sufficient to purify, whiten and harden a thousand parts of glass, producing white hyacinth. The glass would transform into yellow hyacinth, if the Elixir were yellow, ⁽¹⁾ into emerald; if it were green, and into ruby, if it were red.

The Elixir cures the patient suffering from leprosy, if it is smeared over his sores and given to him to drink in the form of a solution. It causes the sores to burst and effuse a yellow water, after which a new skin develops and no mark is left on the body. The electuary used for smearing the sores contains two qīrāts of the Elixir, one mitqāl of diryāq al-fārūqī ⁽²⁾ and two qīrāts of distilled 'vinegar of wine'. Jildakī says that he was present when a person suffering from leprosy mixed a very little amount of the Elixir with the solution of diryāq al-fārūqī in basil wine and drank three dirhams of the medicament thus prepared: he recovered his voice, his complexion became fresh, and, after repeating the treatment several times, he was completely cured.

On the question of the use of the Elixir for the

1. The Elixir of Whiteness passes through a wide range of colours before being finally transformed into the Elixir of Redness.
2. Treacle against poison.

treatment of chronic diseases, besides leprosy, and also diseases affecting the nose and the eyes, Jildakī says that he prefers to remain silent. For, he argues, the Elixir is a deadly poison and, if handled carelessly, would cause serious injuries.

Jābir, continues Jildakī, discussed the properties and the uses of the Elixir in K. al-Damīr (The Book of Secret Thought) and also in his books on 'Properties'. Amīr Hālid described in his book, called Ṣahīfa, his own experiments and observations with regard to the Elixir. "And we have exhaustively dealt with the properties of the Elixir in our books Ṣams al-Munīr, Qānūn al-Kabīr and in a special volume devoted exclusively to this subject. There is also to be found an excellent chapter, on the properties and uses of the Elixir, in our book Al-Taqrīb fī Asrār al-Tarkīb."

Jildakī warns the reader not to taste or smell the Elixir, and to avoid its vapour at the time of projection. For it is a very dangerous poison, and that is the reason why it subdues the toxin of leprosy and cures the body. It is possible to lessen the poisonous quality of the Elixir by mixing it with other drugs; in this way it can be put to many good uses.

Epilogue to the third volume

Here Jildakī draws the attention of the reader to the following points:

1. He who has been initiated into the secrets of the Art sees no contradiction in the statements of the Sages. The words of the Sages should not be interpreted literally.

2. Except for a few differences of opinion, to which reference is made in the present book, there is complete agreement among the Sages with regard to the stone and the operations designed to transform it into the Elixir.

3. The raw material of the Elixir, i.e., the stone, is in actual possession of the tinctorial power, which it gradually improves, in the course of the operations, until it attains perfection. "That which has no quality at the beginning will acquire none in the end."

4. The tinctorial power of the Elixir, unlike that of other dyes, such as saffron, bears no proportion to its bulk. That explains why a very small amount of the Elixir is capable of tincturing large quantities of metallic bodies.

5. The practitioner of the Art must be a true believer in God, and should spend a large portion of his fortune on assisting the poor and relieving the sick. The Barmecides obtained their enormous wealth through their

knowledge of the production of the Elixir. Their downfall was an act of God, punishing them for not having spent enough on charity.

6. The secrets of the Art must under no circumstances be imparted to those who are not worthy of it. Socrates, before drinking the draught of hemlock, revealed all his knowledge, including the secrets of the Art, to his pupil Plato, and instructed him to refrain from communicating anything to Sofīlfius⁽¹⁾, Socrates' son, unless the latter's ability was proved beyond doubt.

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