

Al-Beruni's Book on Mineralogy

The Book Most Comprehensive In Knowledge On Precious Stones

کتاب الجواهر فی معرفۃ الجواهر

أبو الزیحان محمد بن أحمد البیرونی

A Special Contribution
to the Project Series

by

Hakim Mohammad Said



PAKISTAN HIJRA COUNCIL
ISLAMABAD

1410 A.H./1989 A.D.

CONTENTS

Presentation	xiii
Foreword	xxiii

THE TEXT

Part I	3-27
PROLEGOMENON IN 16 REFLECTIONS (<i>TARĀWĪH</i>)	3
Part II	28-227
THE FIRST DISCOURSE ON GEMSTONES	29-197
RUBY (JACYNTH)	29
<i>Prices of Genuine Jewels</i>	42
<i>Rubylike Gems</i>	43
<i>Stories about Rubies and Jewels</i>	45
<i>The Colour of Rubies and Jewels</i>	62
<i>The Badakhshanian Ruby</i>	67
<i>Bījadhī</i>	72
DIAMOND	75
EMERY	84
THE PEARL	86
<i>Lexicographers and the Names and Characteristics of Pearls</i>	88
<i>Humidity in Moist Pearls</i>	98
<i>The Names and Characteristics of Pearls among Jewelers</i>	102
<i>The Prices of Pearls</i>	105
<i>Perforations in Pearls</i>	108
<i>Removal of Blemishes and Defects from Pearls</i>	110
<i>The Essence of the Coral</i>	113
THE SEA AND THE RIVER	114
<i>Shells and Occurrences of Pearls</i>	116
<i>Sites for Diving</i>	122

<i>Depths of the Diving Sites</i>	124
<i>Seasons for Diving</i>	125
<i>The Nature of Diving</i>	126
<i>Stories about Pearls</i>	131
EMERALD	140
<i>Stories about Emerald</i>	143
<i>Emerald-like Stones</i>	146
TURQUOISE	147
<i>Stories about Turquoise</i>	148
<i>Chalcedony</i>	149
THE DESCRIPTION OF JAZA'	151
<i>Stories about Jaza'</i>	153
BERYL, CRYSTAL AND ROCK CRYSTAL	157
<i>Stories about Crystals</i>	161
CORAL (BUSSAD)	164
JAMAST	167
LAPIS LAZULI	168
MALACHITE	169
YASHM	170
SABAJ	171
BEZOAR STONE	172
<i>Stories Pertaining to Bezoar</i>	173
<i>The Animal Bezoar</i>	175
PISSASPHALT	176
SNAKE SHELL	178
<i>Khutu</i>	180
AMBER	181
MAGNET	183
KHAMĀHAN AND KARAK	186
SHĀDANAJ	187
THE DEPILATORY STONE	187

THE RAIN STONE	188
HAJAR AL-BARD	190
GLASS	192
MĪNĀ	193
PORCELAIN GOBLETS	194
ADHRAK	195
THE SECOND DISCOURSE ON MINERALS AND METALS	197-227
QUICKSILVER	198
GOLD	199
<i>Stories about Gold and Gold Mines</i>	203
SILVER	208
COPPER	210
IRON	212
TIN	220
LEAD	221
KHĀR SĪNĪ AND STONES SIMILAR TO IT	223
PREPARATION OF BRASS AND COMPOUNDS THEREOF	224
ISFĪDRŪ	225
BĪTRŪ'Ī	226
TĀLIQŪN	227
Supplement	227
Notes and References	231
Appendix I An Evaluation of <i>Kitāb al Jamāhir Fī Ma'rifat al-Jawāhir</i>	239
Appendix II The Therapeutic Aspects of Stones and Minerals as described in <i>Kitāb al-Jamāhir</i>	272
Appendix III Formulae of the Compounds Containing Stones and Minerals	281
Indices	339

KITĀB AL-JAMĀHIR FI MA'RIFAT AL-JAWĀHIR

In the Name of Allāh, the Compassionate, the Merciful

All praise is for the Sustainer of the cosmos, Who from the beginning to the end is Unique, Who has ordained the survival of Islām as the agency for destruction of ills and misfortunes, and (for bringing about) health and tranquillity, Who has distributed food and fixed the (moral) values, Who has made struggle the source for food in the same way in which He has made the sun and the moon as the interceptors for uplifting water towards heaven. And, when the clouds are filled and laden with rain, winds drive them towards parched land and flood it with the blessed water. And the earth generates plenty which for man is wealth and for animals sustenance. And this self same water returns to the slopes and the oceans. He knows what comes to the earth, what comes out of it, and what comes down from the heavens and ascends towards them. He is verily the Knower and He has issued Commands out of His Infinite Wisdom.

Blessed be Muhammad through whom He has taken us away from the path of ignorance and through whom He has perfected the Message of Prophethood! May they who followed this path and guarded his honour and exalted name be blessed! Blessings be upon his descendants, those who swore allegiance to them, and upon all his exalted Companions!

May Allāh vouchsafe to us the capacity (to be upon the true path).

PART — I

All our praises and encomiums are for Him alone, Who has so shaped life that each creature can sustain itself and live in a measured way, where there is no excess and no want; and for sustenance has made food the principal cause, and through which each body grows on all sides, so that the food, after being digested, helps it (to sustain itself).

God has made plants content themselves with little food, food that is not digested easily. They store it in their bodies, remain contented, and take their stance at one place. They receive food from all sides which they take up through their small veins (vessels). Water seeps in and traverses to their roots. Air, heated by the sun, absorbs the moisture from their branches, and transports it upwards. Whatever thus is

acquired from below is transported to the branches and causes them to grow. And they produce what they were created for, be it the generation of leaves, or flowers, or fruits.

The digestive organs of animals are quick-acting. Animals are locomotory; they would not stand at one place. (At birth the animal draws nourishment from its mother) because of its proximity to her.) Once it has moved away from that source, it will not derive its nourishment in full from the source which once it had at hand. It is gnawed by its desire to eat, chew, and digest food. God has, therefore, vouchsafed to it locomotory organs through whose agency it roves in search of the food around it and He has granted it the type of consciousness which is suitable to it. It has been given the five senses so that it can go forward to acquire what it takes and to avoid what is dangerous for it. It has been vouchsafed the auditive faculty, since vision would not serve the purpose here. It becomes accustomed to these sounds and remains on guard. It has been granted the sense of smell, so that it could discover qualitative attributes of things for fulfilling its requirements. Through its sense of taste it can distinguish between the suitable (edible) and unsuitable (inedible) food. The tactile capacity would enable it to distinguish between the hot and the cold, the dry and the humid, the hard and the soft, the smooth and the rough. In this way its sustenance in the world is assured and it remains swift and clever.

Pause¹

The senses receive reflexes from ordinary impressions, provided they do not exceed the threshold point and are not liable to cause injury. (For example) the sense of sight provides the impression for receiving vision, and light presents the different bodies in their colours and other attributes, e.g. their forms and characteristics. Likewise, voices result from the auditive faculty, and they are transported by air towards the animal. The impressions resulting from the olfactory faculty are odours which are carried to the nostrils. They get detached from perfumes in the manner of the vapours that rise from water. The detached ingredients become dissolved in the air. The impressions of the sense of taste are given by victuals. They are carried through the agency of humidity to the body tasting it, which forces their entry into it, as the organs of the sense of taste are the tongue, the palate and the uvula. Once these organs dry up, the body shall not be able to enjoy the taste of anything. All these four senses are connected with different parts of the body, and do not exceed their stations. As for the fifth sense – the tactile – it extends to the whole body, is related to all the organs, and through them is to be found everywhere. It is not specially confined to a single organ, and therefore, the impressions received by it make their impact felt first.

It is for this reason that the skin is the first receptacle for tactile impressions. Gradually the internal organs take over, and tactile impressions disappear. This is why, as soon as the food enters the inner organs, its presence is not felt.

Pause

In animals, senses are the agents for acquiring water and food, but man enjoys precedence over them because of his rational faculty and he is, therefore, the highest among them. He has been vouchsafed the viceregency of the earth, so that he establishes his statesmanship and leadership. It is because of this that, willy nilly, the earth acts in obedience to his command. God has said:

Have they not seen how We have created for them of Our handi-work the cattle, so that they are their owners?

And have subdued them unto them, so that some of them they have for riding, some for food?

Benefits and (diverse) drinks have they from them. Will they not then give thanks?²

Were man not granted this gift from God, he would not have been able to control even the smallest of things. He is proficient in his defence as compared to many forces he has overwhelmed, nor does he have that much power. Indeed, the statement made by God applies to him:

Glorified be He who hath subdued these unto us and we were not capable (of subduing them).³

And, when he was granted these faculties and was chosen from amongst His Creations so that he acquires things through struggle, two senses, those of hearing and sight, were made the staircase between sensation and reasoning. Sight was made the medium so that he traces among the living things the signs of wisdom, and turns from the created things to the Creator. And God has, therefore, said:

We shall show them Our portents on the horizons and within themselves until it will be manifest unto them that it is the truth...⁴

And again:

Who hath created seven heavens in harmony. Thou (Muhammad) canst see no fault in the Beneficent One's creation; then look again. Canst thou see any rifts?

Then look again and yet again, thy sight will return unto thee weakened and made dim.⁵

How many a portent is there in the heavens and the earth which they pass by with face averted.⁶

Man has been given the sense of hearing so that he follows what is good and grasps the rope of righteousness strongly, gains proximity to Him,

and attains tranquility. This is not a thing hidden from a particular class and the commonalty of mankind. A'sha bin Rabi' says:

(It is) as if my heart knows

What my eyes see and my ears hear.

The poet has shown that these two senses are the media for the accomplishment of knowledge, but the allusion is to the heart, not the mind, as this is what is generally said. God Himself has said:

Lo! the hearing and the sight and the heart – of each of these it will be asked.⁷

Abū Tammām says:

All sapient ones say that the tongue of man

Is the servant of the heart.

Jamil bin Ma'mar al-Adharī says:

We feel afraid of the ear and the eye

When we tend to be sportive.

This is so because these are the instruments of the rivals. They interfere, and learn the secrets.

A blessing is appreciated once it is lost, and the advantage of the auditory faculty is realised only by one who is deaf and that of sight by the blind alone. God has said:

But canst thou guide the blind even though they see not?⁸

And further (in the same *Surah*):

But canst thou make the deaf to hear even though they apprehend not?⁹

God, reprehending the infidels (of Makka) asked them as to who, beside Him, could bring about the night and the day. The other senses are connected with animation (*nafs*) and are closer to the animal than the human factor. It is true, however, that through these vehicles also man has reached this high state of attainment in his rationalising and thinking faculty.

Pause

Affection is a product of homogeneity. It is, therefore, held that like seeks like and the bird seeks its own partner. For the mute, all men are mute, since he cannot get any benefit out of them, although by making signs and moving his fingers he can explain what he means. The mute gets pleasure only out of the mute as if he has found a man who is able to understand him when men in general are not able to follow him. And God, therefore, has said:

He it is Who did create you from a single soul, and therefrom did make his mate that he might take rest in her. . .¹⁰

And again:

And of His signs is this: He created for you helpmates from yourselves that you might find rest in them, and He ordained between you love and mercy . . .¹¹

Mutual affection leads to increased love at the expense of fear and hatred. Should there be a common bond between those who have affection for each other, there is a far greater increase in love. It is through the multiplicity of man and mutual cooperation among men that settlements and cities have sprung up and multiplied.

Pause

Man is constituted, by his very nature, of different qualities which have accumulated through their opposite natures in him. *Nafs* or the bodily breath is often subservient to his corporal temperament, and therefore each person possesses a unique and different temperament. Everyone knows that a thing, which comes into being through the combination or union of different things, disperses no sooner than the uniting or holding force has been removed, and one opposite would like to assert itself over its own opposite. Man and animals have, therefore, to face diseases and accidents, as the external opposite collides with the internal opposite. Man, in his nature, is not possessed of the means of resisting them, and therefore external forces assert themselves as misfortunes and diseases. For overcoming them he relies upon external agencies or stimuli to come to his succour. He is, therefore, in quest of them so that he may safeguard himself. Rather aptly has a poet said:

All desires die with the death of man,

And as long as he lives they accompany him.

All these misfortunes and diseases are not of a piece, such that he could bear their load, and only one agent might suffice for him. They are of different kinds so that only one kind of resistance (or response) cannot cope with them. Man, therefore, felt the necessity of being civilised, but by his nature he is headstrong and obstreperous. He would be more prone to draw benefit from his power and the groups he has formed. But, as Nature would have it, these groups in settlements are established under different sentiments and assertions of force, so that all human beings do not incline towards one force, and the great ones are not followed at the expense of the low ones and all are not annihilated on the basis of uniformity.

As the aims and the goals of the different groups were diverse, different kinds of professions and industries took root. One group, the dominant one, began to overwhelm the other by recompensing it for its labour in an equitable manner. It is not possible always to extract work through oppression and assertion of sheer force. Different requirements and emphases by different groups, the timings deserved by them, and the

fact that one group was comparatively more self-sufficient in one commodity or not accustomed to its use, provided the impetus for the barter system with respect to precious objects instead of money. People, therefore, began to choose things that were exquisite, exotic, scarce, and long-lasting. Man then began to shape them by cutting and selecting the good material, and by making them big or small, imposed a kind of uniformity upon them. He began to carve inscriptions, figures, and patterns upon them but in such a way that their original shape would remain.

God has enabled man to overcome adversity through the bestowal of different means for his defence and wisdom; He guided him through wisdom towards His Signs. He then sent Prophets for the rectification of man's Hereafter. Kings were appointed His Viceregents, so that they would establish justice and equity in matters of religion.

Thus God, through His boundless Compassion and Mercy, filled the earth with heavy objects below the high mountain ranges before the advent of man upon earth, so that he would excavate these to his own advantage. And God, therefore, says:

And the earth have We spread out, and placed therein firm hills, and caused each seemly thing to grow therein.¹²

God has concentrated all the occupations and professions of man in silver and gold. These metals are used in fixing the prices of objects. God guided man towards his acquisition of these metals, and he, therefore, brought them out of the mines where they were languishing for ages immemorial. He kept them safe from the deceits practised by adulterants and by melting them he freed them from dross. Each good has an evil counterpart. And the proponents of an evil want that evil cause be propagated. Need, therefore, arose for the practitioners of good and they were elected to act as Caliphs among men, so that they might fulfil God's commandments, establish justice and equity, and look at the downtrodden, weak and the noble and high as one in their eyes. May God vouchsafe to them the capacity to pursue this goal!

Pause

When God made life and livelihood easier through gold and silver, men became enamoured of them: their hearts began to be drawn towards them, just as gold and silver pass from one hand to the other. Men became greedy in acquiring and storing them, and both, therefore, attained a high status. This high status did not come to them because of their intrinsic nature but because of the barter system initiated by man. Nor are these metals of a high status from any juridical consideration. Both are stones (metals). By themselves they can neither satisfy appetite nor slake thirst. Nor are they capable of doing away with any trouble or

fear. A thing which cannot nourish, cannot become the cause for the survival of a living being, cannot serve as apparel to ward off heat and cold, and cannot save it from the onslaught of evil, therefore cannot be intrinsically regarded as good. The good which we attribute to them is contrived and metaphorical as through their agency man can fulfil his wants. This is why they are universally considered to be good, as they can be used in settling all kinds of affairs. God Himself says:

It is prescribed for you, when death approaches any of you that he bequeath (his wealth). . . in kindness¹³

Also:

Hinderer of the good, transgressor, malefactor. . .¹⁴

And at another place. He has said:

And lo! in the love of wealth he is violent.¹⁵

People generally say that he who gives away money does all kinds of good things since money can purchase things, although intrinsically money is devoid of all these properties.

A sea traveller has narrated a rather interesting incident. The boat in which he was travelling was diverted by a sea squall to an unknown island. He and his fellow-travellers anchored on the shore and went to the island. He gave a *ḍīnār* to a fellow-traveller so that he might buy something which he needed. The latter turned the coin upside down, smelled it, and bit into it. When his five senses did not relish or benefit from the coin, he returned it, as he could not exchange a good thing for something that did not give anything valuable in return. It was actually this notion of exchange that prevailed among the civilised people, and the barter system was the *modus operandi* upon which the economic system reposed. But conventionally and customarily sales and purchases began to be effected through the agency of metals. God Almighty has filled the hearts of people with love for metals so that they are used for the betterment and well-being of man. It is not as if the metals themselves are noble. God has said:

Know that the life of this world is only play and idle talk, and pageantry, and boasting among you, and rivalry in respect of wealth and children. . .¹⁶

And further:

Beautified for mankind is love of joys (that come) from women and offspring, and stored-up heaps of gold and silver, and horses run branded (with their mark), and cattle and land. That is comfort of the life of the world. Allāh! With Him is a more excellent abode.¹⁷

God has thus told us that the rectitude of a culture lies in its women, the comfort of the eyes in the children, and the strength of the heart derives from wealth, but wealth accumulates from beggary, kingdom, mortgages,

or farming. And those, who hoard, have been reprehended by God:

They who hoard up gold and silver and spend it not in the way of Allāh, unto them give tidings (O Muhammad) of a painful doom.¹⁸

"The way of God" is that such people have been created for the benefit of their fellow-creatures so that they might be able, for fulfilling their needs, pass the wealth from one hand to the other, but once the wealth has been hoarded, men will not be able to derive any benefit from it. And this will be contrary to the Command of God. They (the metals) will, therefore, return to the state which existed when they lay buried in the earth. It is like the return of a child to the womb of the mother. Gold and silver, once they have been mined, are like a harvested field or the sacrificed cattle, as if they have no other purpose to serve but to be consumed. The same is the case with the mined metals. They have to be cast into *dirhams* and *dīnārs* and passed from hand to hand in trade and commerce and discharge of obligations.

Pause

The qualities of manliness and chivalry (*murū'āt*) are concerned with one's own circumstances and family, but not so generosity (*futūwwat*). The latter characteristic is not of an esoteric nature. For man can claim possession of his own self and wealth, and, when he takes charge of the responsibilities of the others, suffers ordeals so that they may be comfortable, and does not act in a niggardly manner with respect to the wealth that is permitted to him and interdicted in the case of others, he is generous, and he gains repute for his puissance, compassion, humility, seriousness, patience, hospitality and courtesy. He ascends towards high stations, even though he may not have the ability to rise up to such stations; but he does deserve them.

Jahzāt al-Baramakī relates the incident of a man of Basrah who wore exquisitely turned out clothes, rode upon his best steed, and fulfilled the wants of the people. When asked why he was doing this, he replied he had quaffed the best of wines, and these too to the accompaniment of music by beautiful singers and at blissful moments when nightingales were pouring out their golden notes perched upon trees; but he never experienced the pleasure comparable to that which he derived by sitting among people and listening to the words of gratitude which poured out from lips of the individuals towards whom he had acted graciously and kindly.

Futūwwat has, therefore, been defined as the sweetness of temper that is universally applauded, wealth lavished upon others, rectitude in the lawful cause, and desisting from causing harm or injury.

When a rather well-connected person offered a petition in the court

of Ismā'īl bin Ahmad Sāmānī citing the names of his illustrious forbears, Ismā'īl wrote upon his petition: *Kun 'asāmiyā lā 'azāmiyā 'isāmī bin izāmī* ("Be like 'Isām,¹⁹ and pride not upon the bones of thy forbears."). Ismā'īl alludes to the following couplet by a poet:

It was 'Isām's character that made him into 'Isām

And taught him the art of attack and being the first to be on guard.

God has also specifically pointed to this:

1. Rivalry in worldly goods increase distracteth ye,

2. Until ye come to the graves.²⁰

An ancient Greek sage has said that he who boasts about his ancestors is dead, and those who place reliance upon their sinews and their own excellence are the living ones. A poet has said:

When a person cannot attain exalted stations,

Old bones offer no more cause for pride.

There are some persons who have observed *futuwwat* to such an extent that they have exceeded all bounds in their observance of it. In order to avoid ignominy and disgrace, fight oppression, or to pay the dues to the neighbours, they have not valued their lives. And therefore, we hear about the common people of Arabia who laid down their lives to save those that were their guests or had sought refuge with them. Some of them reached such a pitch of madness in cherishing these chivalrous traits that they were even ready to kill people who would harm a locust that had its habitation near their tent. There are some figures like Ḥatīm Ta'ī who surpassed the limits of generosity. He did not give up the spear belonging to his enemy, although he was near his death, and wished to end his own life with it. Another instance is that of K'ab bin Māmāh Iyādī who was awarded a cup of water on the throw of the dice; he did not drink the water but gave it to his Numayri companion, though he himself was dying from thirst. A poet has therefore said:

A brave one is not he who takes his morning draught and tipples wine in the evening. But he, who goes out morn and eve to inflict loss upon his enemy or to act for the benefit of his friend, is a valorous person indeed.

'Alī bin Jahm says:

The perishing of a good thing at the hands of a noble one is not disgrace. Disgrace is that one should forfeit his honour.

The first couplet describes *futuwwat*. A person can have command over it only when he has an open hand and belongs to the community of the affluent. It sometimes happens that two persons make the same kind of effort, but regrettably fortune does not smile upon one of them, but no one can reprehend him simply because fortune does not favour him.

The couplet by 'Alī bin Jahm alludes to *murū'at* (valour and chivalry), as those who are noble do not retrace their steps. They try to mask

their misfortune and appear before the people as if they are prosperous. Those who are not aware of their real state tend to regard them as affluent and prosperous, and, since they do not incline towards asking for favours, to consider them generous, and immaculate in body and clothes. They also see that they lavish everything God has blessed them with, upon others. Their acts are guided by the following Command of God:

Render not vain your almsgiving by reproach and injury

21

God has thus shown us that the largesse of those who have given away for some invidious purpose of their own is evil. Since they have not been generous because they are governed by a feeling of munificence or for God's Acceptance, they are not deserving of any recompense.

Pause

A wise person will obtain pleasure only out of such intellectual delights that have the stamp of permanence. A fool is unaware of the real pleasure afforded by intellectual delights and, therefore, he regards the splendour of these delights as the end-point of his vision. We see animals wallowing with joy in the dust upon witnessing the various multi-coloured delights disgorged by the earth, and enjoying them. What then, will happen to man who appreciates the substance of these delights? But a wise one gains intellectual pleasure from them, and gazes at these beautiful objects with a penetrating vision and with a perception that instructs him and fills him with a sense of morality. A fool can only get sensual pleasure out of them and he immerses himself day and night in wine and intoxication.

But the period of enjoyment by these persons is shortlived. When these pleasures are at their fag-end, they turn pale and vapid. Their freshness departs and they become like the dry hay that is blown by winds hither and thither, reducing them to dust to be washed away by flood waters. They, therefore, become useless and the hedonist only cherishes their memories. Cheeks like the rose and pale jasmine, narcissus-like eyes, lips like the anemone and pomegranate, teeth like the chamomile that glistens after a fresh shower of rain, countenances like the bowers of the marshmallow and violet:— all are the possessions of a human being for a transient period; as the days and nights pass, they become hoary with age. They are not like the houris and the winsome boys of Paradise whose beauty remains ever-fresh under all conditions. God has created for those who visualise religious piety as the beauty of Paradise in the depths of the moving oceans and in the waters of the mountains and the earth, pearls and jewels which do not suffer the onslaught of time. God has said about them:

There cometh forth from both of them the pearls and coral-

stone.

Which is it, of the favours of your Lord, that ye deny.²²

and bring forth from thence ornaments which ye wear.²³

Further, comparing the houris of Paradise with the jacinth (or ruby) and the coral-stone, He has said:

(In beauty), like the Jacynth and the coral-stone.²⁴

Were pearls and stones to be employed only for adornment, they would also have been like gold and silver and unable to fulfil any want. Like the noble metals, they can serve as currencies with regard to commodities. But pearls and stones also serve as curative agents in diseases, as long as their lustre lasts and they appear pleasing to the eye. But compared to the jewels of the soul, they have no value. Abū Bakr Khwārizmī praised a person saying:

He is a pearl amongst the pearls of nobility. It is not the pearl that comes out of the oyster-shell. It is a cornelian out of the cornelians of the nobles, not the cornelian taken from among the stones.

Pause

An object that really affords pleasure is that which, despite constant use, still keeps its user avid for obtaining more of it. Such are the pleasures dictated by the senses that, whenever they come across a new object, the senses impinge upon it with delight. But (a constant habituation to pleasure) is likely to render the animating spirit dull and, once the senses become disturbed, the animating spirit, being worn out, cannot derive pleasure from (these objects). In dreams, the power of imagination remains confined to the domain of thoughts. Pleasure lies not in voices but in the significance behind them, since once the voices are devoid of any significance, they are mere voices and cadences which are likely to oppress the heart. And, therefore, the animating spirit seeks peace and quiet.

The fact is that all pleasures in the end bring in their train anguish and pain, and produce disease. Their continued practice is oppressive and excessively harmful. Delicious foods are a case in point. Even the best of foods, through constant eating, lose their taste so much that, in the end, they are liable to act as an emetic. Instead of being enjoyable they become repugnant to the body. I am stating this in order to assure the reader that worldly pleasures are harmful and their apparent merits are actually their demerits.

Take the case of copulation. See what the concupiscent desire from it. What they desire is that they should couple with the partners and enter wholesale into their bodies, although they have not the power to do so. And, if they were not incapable of attaining this state and were not obliged to turn back, their movements would have joined breast to

breast, heart to heart, breath to breath, and the inner spirit of the self with that of the mistress.

Those who are prone to exceed the limits (of sexual intercourse) put the tongue inside the mouth of their mistress, reaching as far as her wind-pipe, sucking her saliva with the mouth and the jaw, so that what they do with private parts the same they might do with the tongue. They thereby wish to perform a double act, and achieve double enjoyment. Then they fall back as if they had come across some terrifying object. Their state is really pitiable. They try to overcome weariness and once the state of weariness is over, they return to their lustfulness. Man is brought thus to a pitch of animality which is in his power. About (the Abbāsīd Caliph) al-Mutawwakil, it has been said that constant and unremitting copulation made his body loose and flabby and yet he would not desist. A tank filled with mercury was prepared for him and his bed was laid thereupon in such a way that he would rock upon it without any external source of movement. When he enjoyed this bed, he asked where the mercury mine existed. He was informed that the mercury for his bed came from Shīz in Ādharbījān. He sent his friend and companion Hamdūn, to be the governor of that province, in order to ensure a constant supply of mercury. Hamdūn after his appointment, recited the following couplet:

The governorship of Shīz is worse than dismissal.

Dismissal from here is as good as being employed.

Dismiss me from this place, if you wish to be really kind.

He importuned and entreated till he was recalled to the Court. All these (sensual and prurient) acts are liable to enervate; although on surface they appear delectable. But they are really tribulations which take the form of comfort. They are a decoy for men. Nature has reserved these pleasures for the survival of the individual and the perpetuation of man. Delight is an attraction, and, therefore, the foolish (among us) are likely to be deceived. The aim of God — for which He has based the continuity of the world upon agriculture, procreation, and animals — is thus fulfilled.

The body of man is especially compounded of malodours. Even if he be healthy, owing to some changes, his mouth begins to smell. This is due at times to the accumulation of impurities, and at others due to the impurity which fills his stomach. And, therefore, after slumber and upon an empty stomach, this malodour is especially to be detected. The malodours of the mistress and the lover become commingled through each other's saliva. Ibn al-Rūmī, in this context, says:

(And) likewise the breath or waft of the gentle breeze of the bower is sweet-scented, whereas the breath of people becomes putrid.

Again, man perspires. This is due either to the impact of the humid air

upon the body or by his having put on heavy clothes for keeping himself warm, or sometimes through excessive physical exertion. Gradually, therefore, something like sweat begins to accumulate upon the sudoriferous pores of his skin. This accumulation is also due to decomposition which is not apparent. When the perspiration begins to accumulate in the armpits, it begins to be malodorous. It also generates malodours it collects upon the pelvic girdle, at the femoral bone and between the fingers, especially if one has put on gloves. It also collects when there is a deposit of putrid matter which results in the course of movement and by the friction of the external organs. In the latter case malodour prevails over the whole body. It also forms when the palms and the feet are rubbed against each other till they are warm. Whatever the part of the body, perspiration and dirt are present in one form or the other, although they may not be visible. The noblest part of the human body is the head. When some-one asked Ibn Abī Maryam why he wore a turban (*‘amāmah*) and a band round his mouth (*lithām*), he replied:

“I regard that part of my body which has in it all kinds of knowledge about the world and which takes me to the higher aspects of knowledge through the agency of the senses, as deserving of adornment and of being saved from filth and pain.”

It is not only repulsive to see or to touch, but even to speak of the perspiration and filth that keeps on seeping out of the body pores. But to some people consumed by their appetitive soul in their frenzy for love, these things appear beautiful. They are blinded by love, and, therefore, even find beauty in tears which they compare to scattered pearls. The lover regards the saliva of the beloved to be sweet and he compares it to honey and wine. He would liken the smell of the beloved's mouth to musk and amber, and in his love ecstasy does not for a moment consider these things to be noxious. He likes them as long as they are a part of the beloved's body. But considered apart from the beloved, if what flows out of the eyes and the mouth becomes congealed the same person would find these things revolting and would not even touch them or look at them. When tears become congealed in the corners of the eye, they are converted into dirt. When they flow from the eyes, they are crystal-clear, like pearl-drops, but, once they move away from the eye and the cheeks, they become repulsive. The same thing is true of the saliva which, once it is out of the mouth and the teeth strikes one as repulsive. I should believe that if the mistress of a person seized with inordinate love spits on the food, he will not be able to eat it, especially if the spit contains phlegm, which has come through gurgitation from the lungs to the windpipe or has come from the windpipe through the route of the nostrils. If anyone desires this, let it be judged by someone who is safe from the frenzy of love. It will be proved beyond any doubt that

such a person loves his own self and because of his love of the self he loves the things connected with his own self. His narcissism makes him blind to his own follies. It is a well-known proverb that excessive love for a thing renders a man blind and impervious to reason. Besides, such people look with repulsion upon beloved with love. And, therefore, it has been expressly stated in the Traditions of the Holy Prophet that one should not blow breath over food. And so we find that the reality behind the above-mentioned things is revulsion and their seeming charm is but temporary. What is temporary always disappears and a thing reverts to its original form.

Pause

There are different aspects to a man's life. Some are praised, others reprehended. The superiority of good things is but obvious, as the depiction of an evil aspect pertaining to an evil man is revolting to even that man, and he gives the lie to the others, claiming that he does not have that defect. He is pleased by descriptions of good things, even if he has not done anything good. He does all this in order to save himself from disrepute and punishment. Laudable actions and noble qualities derive from *muru'āt*, and *muru'āt* stems from personal cleanliness and nobility. People of affluent means treat others chivalrously and generously out of their own good will. How can the poor act generously? As for the man of average means, his sincerity depends upon a true and altruistic person possessing a noble disposition and good manners, such that both are fused into a single soul with two hearts beating side by side. It has been said about a real friend: "He is thee, even though he be a stranger to thee". Such friends detest the same kind of things, and a friend chooses for his friend what he likes for himself.

There is no limit to the number of friends that one can have. This number is proportional to one's capacity. But at the basis of sincerity is the sentiment of *muru'āt*. They should be so placed as to be of help to each other, and, despite the large number of true friends, keep the fire of *muru'āt* burning, and thereby advance towards government and leadership.

One should keep his courage high in his quest for good. He should always be observant as to what is good for his own people, especially those close to him. He should be humble in his desire and should rise to the occasion.

The thing closest to man is his own self, for which he desires good. Then come those things that are closest to his animating self and the body, such as apparel which clothes his body, his wife whom he loves, his servant who fulfils his wants, dining utensils, etc. As for corporal beauty, it is appreciated and loved by men in people they come across.

Even the Holy Prophet (peace be upon him) used to send delegations comprising men who were personable and bore charming names. The Prophet often changed names deriving from mountains and places, and substituted good and pleasing names instead. But bodily forms are moulded in the womb of the mother: these cannot be changed. Now as regards the forms of the animating spirit, e.g., habits and deportment, these can be reformed by discipline, meditation and prayer, and cultivation of courtesy and deportment by a person who has command over the self, so that he makes his animus gradually shed away the evils he possesses and adopt the ways which are described in books on ethics. The first thing that comes up is his countenance. While he cannot change it, he can at least keep it clean from impurities. Man should not lag behind the non-rational animals. Behold the cat. When it begins to inhabit the abodes of man, it keeps the house and the floor clean from its own excrement, and selects a special place for defecation, just as man builds his own closet. In other words, it follows the juridical command of God:

O ye who believe! When ye rise up for prayer, wash your faces, and your hands up to the elbows, and lightly rub your heads and (wash) your feet up to the ankles. . .²⁵

See how conscious the cat is of its cleanliness and how it buries its faeces in the earth so that no putrefying smell is let out, how it licks its organ of excrement like a man performing ablution. It then cleans its own hands and feet by licking, and having scratched its nose from below, sneezes in the manner of a man cleaning his nostrils with the attesting finger, so that the humidity is expelled. It then gurgles and makes movement as if it is douching its nose with water. It then moistens its palms with its own spit and lightly rubs its ears.

The purification of man is dependent upon water, whose odour and purity are pleasing to the soul and the self tastes the pleasure of life. How can that which in itself is ugly and evil-looking bring about cleanliness? This can be done by water alone which the *Shari'ah* has adjudged to be clean or its substitute. Advice given by noble Arab men and women to their daughters, when as brides they left for their husbands' homes, revolves round this single point. Thus 'Abd Allāh bin Ja'far bin Abī Talīb (may God be pleased with him) advised his daughter at the time of her departure:

"Do not be excessively egoistic for this is the key to divorce. Do not display too much wrath, as this is liable to generate malice. Be most attentive to the outer countenance you wear. The thing that adorns the countenance most is the collyrium. Love scent and perfumes. And the thing that bears the best perfume is water."

'Āmir bin al-Zarb al-'Adwānī, while marrying off his daughter to the son of his brother, told his wife:

"Instruct thy daughter to have water with her when she goes to the wilderness, as water is adornment for the upper part of the body and purification for the lower part. She should bear company with her husband when he is in heat. Good fortune lies in surrender and union (of spirits). She should not sleep too much with her husband, as, once the body feels oppressed, so does the heart."

An Arab philosopher advised his daughter, while she was going to the bridal chamber:

"Be like a slave-girl to your husband, and he shall be like a slave to you. Be soft to him, as softness is more effective than magic. Use water; water is the chief of all perfumes."

One woman offered the following advice to her daughter:

"Be the bed for thy (husband) so that he becomes the source of sustenance for thee. When he is in a happy mood, shun pensiveness; and when he is laden with sorrow, eschew pleasure. He should not see any evil in thee and should smell pleasant perfumes from thy body. Never let any of his secrets out, lest thou fall in his eyes. Use water, oil, and collyrium, as they are good perfumes."

Another woman said to her daughter:

"Keep thy body perfumed and anointed. Be obedient to thy husband, and among perfumes use water most."

Another gave the following advice:

"Cover thyself, be considerate to thy husband, and use water as perfume."

And yet another said:

"Do not carry out every order given by thy husband nor be so persistently disobedient that he gets disheartened. Be sincere, and make water thy perfume."

All that has been said above is necessary. But once man has washed the face and the orifices of the body and keeps on washing his body with water he should further adorn the face with colours that are visible in the light. The body can be adorned with powders and perfumes, especially when there is a natural or artificial pallor on the face. The teeth can be cleaned by means of dentifrices and *miswāk*. The eye and its lids should be kept clean and decorated by pencilling them with collyrium. As and when required, the hair can be dyed, trimmed, combed, and taken out, while the beauty of the nails lies in their being regularly pared.

Now for the things that keep clinging to the body. The most important among these are the clothes as they keep attached to the body. It is, therefore, essential that the body ought to be kept clean so that dust does not deposit upon them. The clothes that are suitable to the season and the time should be dyed with colours suitable to the occasion so that the shortcomings of the body and apparel are done away with.

This would have the further advantage of being in harmony with the jewels and stones that have been created for the body's adornment. 'Umar (bin al-Khattāb) was once asked what *muru'at* is? He replied that it is the neatness of the clothes. Someone has said the apparent *muru'at* is embodied in the immaculateness of clothes. This is so, because anyone conscious of the body's cleanliness first cleans his body, so that the trousers do not take up the impurities of the body. Then he attends to his movements and the cleanliness of the house so that the clothes do not catch dirt therefrom, and become soiled. See for yourself how through the cleanliness of the apparel everything has become clean. The following couplets should suffice for those who are not careful about personal cleanliness:

Neither power nor the radiance of Islām is suited to Abū al-Fath.

Filthy clothes, a dirty *'amāmah*, a repulsively filthy onager, a grimy countenance, a filthy neck, and a dirty slave (accompanying him).

Cleanliness and freshness of clothes are of great importance. The cleanliness of the animating spirit and the heart, clothes, trousers, and the shirt have been compared to purity. Some exegetes have said that the purport of the following *āyah*:

And all abomination shun!²⁶

relates to the purification of the heart and the purgation of the intention. This interpretation is possible. Be that as it may, the *āyah* has exquisitely blended the outward with the inward. Both are according to wisdom. This is the lowest rung of *muru'at*. Some have offered the definition that *muru'at* is the love of statehood, possibly because statehood goes with high seriousness and generosity. But this is *futuwwat*, not *muru'at*. Nābighah says:

They are chaste and pure. On the day of Sabāsib²⁷ they are greeted with the sweet basil.

The Day of *Sabāsib* has also been called the Day of *Sha'anīn* as this verse has been said about the kings of Ghassān. The rulers of Ghassān were Christian. They probably ascribed importance to the sweet basil, as those who entered Jerusalem along with Jesus Christ, had sprays of citron and olive in their hands. This supposition is not very improbable. But the aim of the verse is to etch out the importance of flowers. Thus, when the children of the Ghassān kings travel in desert tracts, people go out to greet them with sprays of flowers. That is to say, flowers are not to be had in deserts, but these people are not wanting in flowers even in these regions. You must have noticed that, when kings and potentates depart for Hajj, flowers and vegetables are packed to bear them company. Everything that is rare is used as a symbol. Thus Bakr bin al-Nattāh al-Hanafī says:

I have brought for you a bouquet which is far superior to the myrtle

branch.

The poet has used the word, *rāmishmah* which denotes twin leaves which are joined in the middle and discrete at the end, like the leaves of the myrtle. Such leaves are but rarely found. And, therefore, while greeting the great ones, those leaves are taken in the hand, especially while offering greetings to the Daylamites.

After clothes, come the jewels for adornment. Each country has its own style of jewels, and each nation has specific jewels for use as rings, jewels in the crown, necklaces, tassels, caps, gauntlets and gloves, in pillars and sticks for use by courtiers.

Jewels are also used in the ear-rings, diadems, combs, clothes, bracelets, wraps, arm-bands, necklaces, and neck bands of women. The extravagant have gone so far as to have jewels studded in things that are far removed from the body, e.g., the walls of the house, roofs, doors, and ventilators which they decorate like their jewels. All this is done so that the visitor to their house is impressed at first sight. Wealth and power exudes from these things, but all that is far removed from reality, and pride and dissimulation is all too visible.

Pause

The most important aspect of the perfection of *muru'at*, after purity, is the use of perfumes. Perfumes attract others and invite them to proximity. They are also liable to cover up defects. The nexus of the definition of *muru'at*, offered by someone, namely, that one chooses for others what he chooses for himself, resolves itself into the segregation of what is permitted and what is prohibited. The definition given by another is that *muru'at* lies in eschewing the prohibited and pain. In fact, if *muru'at* is defined as being held steadfast to the cause of faith, we shall have all these things incorporated therein, as faith demands justice and equality. It asserts the total annihilation of cruelty — since cruelty is the reflection of one's selfishness — and coming to the succour of the oppressed. The same implication is comprehended in the definition of *muru'at*, namely, that one should not perform an act secretly which he would not like to perform overtly. He who has beautified his actions with nobility, has taken his food from lawfully earned income, has invited others to share equally in what he eats, has devoted himself to self-purification and has crowned the latter with perfume, which is one of the things of the world which the Holy Prophet (peace be upon him) has praised, has pleased his fellow-partaker of food, brought him closer to himself, has honoured him, has prevented ordeals from overtaking him, has chosen for himself what he would like to choose for others, and is not of the company that is niggardly in his largesse or eats alone, or beats up his own slave.

If by *thiyāb* in *āyah* 5 of *Sūrah* LXXIV are implied intention and the inner nature of man, then the purgation of the self invites the individual to submission, respect for contentment, and right actions, actions that augur well not only for the life present but also for the Hereafter.

Muizz al-Dawlah ibn Ahmad bin Būyih was a very orthodox Shi'ite. He sent from the environs of Iran for a person who derived descent from Hadrat 'Alī. This gentleman was celebrated for his integrity, character, and seriousness. Muizz al-Dawlah said about the 'Abbasid Caliph, Muti'bi-Allah that he kissed the sleeves of eunuchs. He, therefore, desired that the deserving should have their share. Mu'izz al-Dawlah further said that he had made a demand upon the time of the savant so that, through him, the Caliphate and the reins of government should pass on to the deserving. He could discharge the responsibilities of the *ummah* in a better way, as God had vouchsafed to him together with his descent and bearing of justice, compassion, and love.

The 'Alavī savant thanked Mu'izz al-Dawlah, praised him for his sentiments for the Ahl Al-Bayah and the offspring of Hadrat Fātimah Batūl, and for advancing the cause of Allāh's faith. Then he sought permission to speak his thoughts frankly and at length. Permission having been granted, the 'Alawī savant said:

People in general in the domains of Islam have become inured to the invitation extended by the 'Abbāsides. They obey them as they obey Commands of the Holy Prophet and God. They acknowledge their supremacy and consider them to be the source of all that is good and lawful abiding by the edicts of the governors and the agents appointed by them. They have seen the 'Alawids being slain and imprisoned, and believe that this is because they have revolted against the caliphs who are the viceregents of God on earth and against what is good and right. If you clothe your intent with action, and make obvious what is in your heart, you will find the republic of people acting contrary to its ethos. They will not acknowledge you immediately, and those from whom you have wrested the Caliphate will become envious of you, even though apparently they might have acknowledged your Caliphate. You will thus have become the cause of having transferred the Caliphate from one tribe to the other and of internecine strife, such that you will also have become sick and weary. And I will be the cause of all this. I will appear very evil to you. You will repent your action; and I will be recompensed with pain and sorrow. This would be when you are victorious. If, God forbid, you are unsuccessful, you will have forfeited your kingdom, and I will not have peace as long as I live in the *Dār al-Islām* unless, of course, I choose to escape to the *Dār al-Harb* and become of the company of idol worshippers. Why, then, do you wish to involve

yourself in strife? As far as I am concerned, I can assure your Exalted Highness, that I am happy and content in the respect I command far and wide, and that everyone carries out my wishes. No governor, potentate, or seigneur is higher than the Hand which God has given me. Please permit me, Sire, to live as I am, so that I may enjoy the life as you are enjoying the fruits of your kingdom. Despite your being a ruler, you feel no disgrace in kissing the hem of my sleeve, that is far purer than the dirty lips, yellow teeth, and putrid breath that you enjoy each night, and which do not repulse you with their staleness. Pray then to God that He may guide you rightly and grant you the happiness of this world and the Hereafter and strengthening of faith. Make my prayers the food for your afterlife.

Mu'izz al-Dawlah heard the speech of the savant very attentively, and in his heart welled up so much respect for the savant that he cried, stood up, kissed his eyes and head, and sent him to his home with the utmost respect. This incident is epitomised in the following brilliant couplet by a poet:

"Guard your blessing as sins expend blessings."

You can hope for religious and other-worldly redemption only by acting upon the purport of this verse. The blessed are happy with their fellow-creatures and with what God has given them.

Pause

All human beings have but one ancestor. They bear the same form and yet they are consumed by envy and animus against each other, since it is inherent in the nature of man to be different from the other in temper and disposition. This has been happening from the time of Adam: the sacrifice of one is accepted, that of the other is not. Were there no fear of God or that of a just ruler, then each man would have treated the property and the belongings of the other as his own.

So long as a king is not true to his command, word, and promise, he cannot function politically. This is the reason why governance has not remained confined to tribes but to specific families. And it does not become restricted to families but to an individual belonging to that family, to the individual who surpasses others in that family. Through him it passes to his family, and especially his heir. Thus the country becomes theirs. Divine Assistance and God's Command direct that members of a certain family be provided with the right to rule, as in the case of the monarchs of Persia, or as in the case of the Quraysh who held the right to Caliphate and Imāmate, or as in the instance of those persons whose love and affection is, for the people of Islām, a pathway to God, or in the people of Tibet who hold the belief about Khaqān the First that he was the son of the sun, and who appeared upon earth accoutred in

cuirass. Or take the case of the people of Kabul in the age of ignorance. They believed that their first king, Birhmagin Turkī, was born in a cavern which is today designated by the name of Baghrah and he came out of it wearing a diadem. There are other myths and fables of this ilk which have gained currency through the Will of God, so that everyone does not begin to dream of kingship and serve the king.

Just as monarchs were the recipients of these exalted attributes, they also arrogated to themselves characteristics that bespoke their high stations. They had high and magnificent audience chambers, vast fortresses, long and broad courtyards built for the future generations, and high thrones installed. All this was done, so that they might look heavenward, and cast their glances at the commonalty and the nobility among mankind. The poet, Buhtarī, has alluded to this aspect in the following couplet:

What thou hast been granted has been granted to the full moon, that
thou should be high and glimmer.

They had no other way to show their magnificance except to put on the diadem and long capes and extend their hands, so much so that they were designated as "the pluckers of the stars." And therefore, the people of India have designated a king of theirs by the name of Mahā Bāhū, that is, one having long arm. The Persians have given the appellation of *rīwand dast* to Bahman Ardashīr. *Rīwand* is the Persian equivalent for the root of the rhubarb which has the characteristic of not coming out of the earth until and unless its root does not reach subterranean level of water, even though it may be at the top of a mountain. All these symbolise high courage, long-handedness and puissance.

Besides, monarchs decked themselves with precious objects so as to overawe the hearts of their subjects with the power of their wealth, to make people look with anxious eyes towards them and link their hopes with them. They devised strange and exquisite ways to bring about all this, so that they might expose the secrets of the nobility, and the action of the commonalty to full view, act according to the exigency of the situation, and organise the affairs of the vanquished regions immediately. For this purpose, therefore, they established the roles of messengers, boats, horses and pigeons so as to circumvent the long distances and carry their orders within short periods (to distant places). People began to be in secret and open fear of them, and avoided transgression and intransigence. There are several stories pertaining to such cruel monarchs.

Pause

Persons most avid of wealth are the monarchs since by means of wealth they are able to exercise their control. Caliph Mansūr told his guard, Rabīʿ:

O Rabī'! I accumulate wealth. People call me tight-fisted, although God has kept me safe from this evil habit. But I saw people subservient to the *ḍīnār* and the *dirham*; I made them obedient to myself through them. In the result, *ḍīnārs* and *dirhams* accumulate with me, and I distribute them among the people whenever they need them. Let the fact be told, I never hoard them nor do I ever collect treasures, since they flow out faster than the water that cascades and eddies down the slope; there are gaping maws to receive them, many palms open to grasp them as recompense and gifts, many an eye casts its gaze upward upon the first moon of the month awaiting the shower of stipends and gifts, and many a finger is waiting for entering credits in the ledgers.

It is because of this that monarchs and rulers are afraid of seeing their wealth whittled away lest this chain comes to an end. Each collective object is liable to be scattered, and what is liable to be dispersed into its ingredients is marked for annihilation.

I remember a constant habit of the late *Amīr* Yamīn al-Dawlah Mahmūd²⁸ God's mercy on him, who no sooner spotted a quarry and made a hunting of it, was in quest of another, and he took his hunting retinue in that direction. He searched for the quarry as it would move from one valley to another. Once on returning from Khwārizm, he became rather uneasy, and said: "Astrologers tell me I have a little over ten years left to me of life." And then he averred: "I have my fortresses stuffed with all kinds of wealth, which, if spent upon the people according to the time left to me, should suffice, however efficient and loose-fisted (I) may prove to be." I was thrown into a state akin to intoxication when I heard this, and about which he was always suspicious and felt that he was wronged by me. I said: "Render thanks to God, pray to Him and beg Him to keep your treasury safe. That is to say, let your fame and your government be far from harm as these treasures accumulate only through them, and let not a day pass spelling harm to them." His uneasiness was alleviated when he heard my rejoinder.

This admonition from me has a moral for those who perceive. Look at the fate of *Amīr* Mas'ūd the Martyr (may God favour him with high station). When he was martyred, his government was dispersed, and whatever wealth he had collected, whether inherited or earned, was scattered to the winds, as on the Day of the Smoke,²⁹ everything that the tribe of 'Ād had was wafted like dust. This was the writ by Destiny.

Pause

Treasures interred in the earth lie uselessly. These treasures generally belong to two opposite groups. They are as distinct from each other as two things can be, that is, the ruler group and the humble group. The

latter kind of people bury their money and belongings in the earth because they realise they are inured to begging, and that this is their stock which has to remain intact. This is specially true of the beggars who beg with a great deal of importuning and persistence. They have nothing with which to buy their food or drink, and they, therefore, devote themselves to collecting money, gifts, and jewels, converting them into heaps. Thus they transform small coins into larger ones, and the latter into *ashrafis*. There is no trustee for them but the earth which returns to them their trust in whole. And, therefore, this trust of the earth has become proverbial and we say (about an honest person) that he is more trustworthy than the earth. Most beggars die from starvation as they are hard upon themselves and stint on food and despite hard circumstances go on accumulating wealth. They do not wish that what they have earned through their own adverse fortune should reach someone else and that they should will it to someone. Whatever, therefore, the treasure, large or small, lies interred in the earth.

As regards kings, they bury treasures in the earth as they encounter ordeals. They commit to the earth jewels and money in their fortresses and palaces, and move their treasures in such a way that is impossible for those transporting them from one place to the other to know where the treasures have been buried. They are on the look-out for secret places which are not within the knowledge of another person. There have been kings who have not hidden the places of interment from those who transferred the money and placed their trust in God. Some monarchs hid them from the labourers and devised all kinds of stratagems, e.g., transporting the labourers in chests at night to the place of the burial, and, the work done, taking them away in the chests, also at night, so that they might not be able to guess where the treasure was buried. In such stratagems it is essential not to employ the same labourer twice, so that he may not become too eager to locate the burial ground. They thus have their object fulfilled and the danger of its being found, removed. A king, however, was rather careless in this transfer. The person who supervised the burial, bored a hole in the chest in which he was conveyed, kept a bagful of rice and scattered the rice-grains on the way. Next morning, he went to the place where the treasure was buried, and took it out. The monarch did not know about it. He felt the need for it twenty years after-wards but found nothing there.

These treasures lie interred intact. Sometimes accidentally people come to know about their burial, if there are floods (and other natural calamities). Bajkam Makānī had collected his treasures with great labour and love, and yet they remained committed to the earth as he was killed by the spear of a Kurd. Likewise, the treasures of Abū 'Alī Muhammad bin Ilyās remained lying in the desert of Kirman as he had to leave and

flee to Soghdiana helpless and displeased with his son. Truly has it been said: "Many struggle for those who live in comfort."

Pause

As monarchs and rulers often undertake journeys at their will or for obligatory purposes, they have to keep their treasure with them so that the servitors and equipage may bear them and they may not be put to any inconvenience for the expenses incurred during the journeys. Silver is light in weight but heavy in so far as payment of commodities is concerned. But they required something costlier. They, therefore, decided upon gold as it is ten times costlier than silver. In ancient times its value was fixed ten times higher than that of silver in the payment of blood money and *zakāt*. This value did not persist in the later periods, sometimes because of its rarity and at others, because of the excess or decrease in the world than silver, and silver rarer than copper. Again, silver is less in mass and fetches greater returns and is heavier than copper.

It is rather surprising that all these three metals are mined from Zarūbān, but the ratio is the same: the weight of gold is ten *dirhams*, that of silver, fifty *dirhams* and of copper fifteen seers.

It was easier to keep silver with oneself. Kings and nobles, therefore, made it their companion during journeys. They also observed that at times when they came across unforeseen troubles, their redemption lay in a thing that was less in weight and quantity. They, therefore, banked upon jewels as their bulk is less than that of gold in much the same way as the bulk of gold is less than that of silver and that of gold and silver less than that of the commodities purchased by these metals. They, therefore, began to collect them and wear them on their bodies. And, whenever they had to be hidden, they belie their presence to the enemy, as happened with the people of the Cave.³⁰ The coins which they had with them were old, and therefore, people thought them to be the finders of ancient treasure. In reality, jewels are associated with the goods of kings and nobles. If jewels are found upon the person of someone who is neither a king nor a noble, people become suspicious about him, believing the jewellery to have been purloined and everyone is keen to arrest a thief. Or they might be led to believe that such a person is in reality rich and the real possessor of the jewellery but that he has disguised himself. People are in search of such a person as well.

Some rulers also kept jewels in mosques and distributed them among the guards of the mosques or placed them in the custody of the frontier guards for safety and preservation.

The pious Caliphs or those Caliphs that followed their practice, such as 'Umar bin Abd al-'Azīz, several Marwānid Caliphs and a few 'Abbāsid Caliphs also did the same thing, as they thought the Caliphate

to be an onerous burden, more of an ordeal than comfort and busied themselves with the idea of shedding the load but were afraid of its fatal nature.

A person hailing from a city in the extremity of the west has narrated (to me) that the government of that territory is handed over to the nobles turn by turn. Each chief voluntarily relinquishes his reign after three months. The period having lapsed, he offers *sadaqahs* with joy and returns home as if he has been relieved of confinement, reverting to his daily chores. This is so since rulership is actually the surrendering of ease and comfort, so that the oppressed may be meted out justice in relation to the oppressor, and his life, possessions, and the family may be protected. He has to devise stratagems to safeguard their interests, to protect their lives and properties, and to exercise a watchful eye upon the stipends and wages, e.g., the wages of the watchman of a locality, for the guide of a caravan, etc. Although the wages of a caravan guide have come to an end through changes in traditions, nevertheless each age has its own rituals and traditions which have to be borne in mind, otherwise the whole system will collapse. The ruler has to keep in view all the above traditions.

Pause

Eating from silver and gold utensils is prohibited as by doing so the usefulness of these metals becomes extinct, as we have said before. Also, the Satanic boast comes to pass:

... and surely I will command them and they will change
Allāh's creation.³¹

It is quite possible that this prohibitive order of the *Shari'ah* embodies the consideration that such utensils are possessed by monarchs, and not by the commonalty. Man has to face the vicissitudes of fortune all the time. He is at times indigent and at others, opulent. If through confidence in one's own wealth, these things of utility are converted to gold and silver utensils, change in fortune might dictate their conversion into *dirhams* and *dīnārs*. It is quite likely that people might find out about this, and their intentions might change, as they will have become demoralised. The enemy, upon the divulgement of the secret, will look askance greedily upon this happening. Man is by nature selfish and greedy and would like to usurp the rights of others.

This prohibitive command, it is possible, takes the above point into consideration, as the *Shari'ah* takes cognizance of the worldly and eschatological requirements of the good people and the rich. May God vouchsafe to all the capacity to intend and think rightly, so that they may morally benefit from their predecessors. May He keep us all away from the path of sin and save us through His Boundless Compassion from the clutches of adulterators.

PART – II

It is now our desire to divert our attention towards the description, categorisation, and assessment of the precious objects and jewels that are buried as treasures. For this purpose we will be presenting a discourse which will be followed by another. This will address itself to the values of the minerals as the latter are similar to jewels. Both have been suckled by the self-same mother and both surpass all other objects of adornment in both beauty and utility. This treatise of mine shall remain in the treasury of the Most Glorious King, the Chief of the Respected Ones, the Strengtheners, the Star of the Faith, the Pole of the Faith and the Pride of the *Ummah*, Abū al Fath Maudūd bin Masūd bin Mahmūd as a memorial. May God bless the youth of this monarch with exultation and cheer and grant him glorious victories. When he has left his affairs in the Hands of God, God shall have become his Support and Succour. He has made the love of God his creed. Whoever has begged from him forgiveness in the Name of God has been reprieved. Whoever sought from him refuge in His Name has been granted asylum. Besides the largesse which he has lavished, he has made it his practice to distribute secret *sadaqahs* so that in the realms of the secret and the apparent both, he may practise what is good only. May God Almighty fulfil his wishes, and vouchsafe to his acts the Seal of His Acceptance.

I have not come across any other book on the subject than that by Abū Yūsuf Ya'qūb bin Ishāq al-Kindi on jewels and the likes of jewels. This book is unique and of a very high standard. Indeed, in every field, this philosopher has brought to bear his originality and interpretation. He is undoubtedly the leader of those who think, and an example for others.

I also procured a treatise by the calligraphist, Nasr bin Ya'qūb Dīnawarī which he has written in the Persian language; the object of this treatise being to be of use to the non-Arabic speaking public. But he is more or less a follower of al-Kindī for most part. It will be my effort to present here all that is found in these treatises. I shall also try to include everything that I have learnt from the jewellers, although the so-called famous stories of the jewellers are tinged with the fiction of the storytellers and the gossip of the bazaar. This falsehood is of such magnitude as to stun heaven and earth.

Ptolemy is an example for us in this behalf. He was very chary of the gossip of the jewellers. Yet he was always keen to hear from them accounts of their journeys and conditions for correcting latitudes and longitudes. I pray to God for the fulfilment of my intention and the capacity to undertake this work. It is God Who sustains and assists.

THE FIRST DISCOURSE ON GEMSTONES

Nasr bin Ya'qūb has commenced his treatise with the enumeration of the names of jewels, e.g., the jewels that were famous during the Marwānīd and 'Abbasid times among the jewellers, such as 'Awn al-'Ibādī, Ayub al-Aswad al-Basārī, Bishr bin Shādhān, Ya'qūb al-Kindī, Sabbāh, Abu 'Abd al-Rahmān bin al-Jassās, Ibn Khabbāb, Ras al-Duniyā, and Ibn Buhlul.

We have not followed this practice. The number of jewellers in each age and every city is large and varies. They enjoy fame in the courts of kings and their fame increases or decreases according to their knowledge and expertise.

And over every lord of knowledge there is One more knowing.³²

THE RUBY (JACYNTH)

Of all the stones the *yāqūt* (ruby) has the first place in grade, beauty, and rank. God has likened the houris of Paradise to it:

(In beauty) like the jacinth and the coral-stone.³³

The best variety of the ruby comprises several kinds: the white, dust-coloured, black, yellow, and red. Of these kinds the red is regarded as the best, as the dust-coloured and black appear unsuitable upon the face and the skin. Such a colour recalls to mind a person who has been strangled and slapped. Pallor is associated with persons who have been wakeful or terrified.

Hamzah bin al-Hasan al-Isfahānī says that in Persian it is designated by the name of *yākund* and *yāqūt* is its Arabicised name. Persians call it the *subji-asmūr* too, which means the plague-remover and also *subj* only. Among the treatises indited upon the red kind, the name employed by Hamzah has been reproduced. The people of India call it the *padam rāk*, and liken it to a stone that is clear and red. It seems *rāk* is its name and *padam* is its characteristic. In their language the red water-lily is known as *padam* and the white ruby has been frequently used in their aqueducts and reservoirs. The dust-coloured variety which is called the *nīl* is not used there. We have not seen this kind in India unless imported from somewhere. The dust-coloured kind appears red at night, but this red colour is not real; it is imaginary. It reappears as dust-coloured when sunlight shines on it. Every flower that is dust-coloured has this characteristic, e.g., the water-lily. If vinegar be rubbed upon the dust-coloured variety, it appears red like the red rose which on getting drenched with water, appears greenish. If dust and the dross of lead are sprinkled over it and rubbed lightly, it assumes a colour that is intermediate to that of

verdigris and the pistachio.

There are two grades of the red ruby. One is of a very high grade and is popular among people. The second grade is very inferior which no one likes. The best grade is that of the *'ummānī* kind, followed by the *bahramānī*, *arghawānī*, *lahmī*, *gubnārī* and *wardī* kinds. Some authors have also mentioned the *banafshī*, a kind between the *arghawānī* and *lahmī* kinds. But people in general do not distinguish between the *arghawānī* and *lahmī* kinds. The grades we have mentioned are by way of similitude. Each country and nation has its own names for these grades.

Some have held that the *rummānī* (pomegranate-like) and the *bahramānī* (safflower-like) varieties are identical. But the people of 'Irāq use the name, *rummānī*, while the people of the Persian 'Irāq and Khurāsān call it *bahramānī*. Al-Kindī's arrangement of the grades testifies to the latter designation, as he regards the *bahramānī* kind as the best.

It has been said about the pomegranate-like colour of the ruby that, if scarlet blood is sprinkled and spread over a clean piece of silver, the resultant coloration would be like that of the pomegranate-coloured ruby. Scarlet blood is that which is temperate and healthy and besides, flows in the veins. The blood of the right ventricle is scarlet.

Al-Kindī has described the *wardī* (rose-coloured) variety first. It is rose-coloured with a little whiteness, but he has accorded preference to the *khayrī* (Hollyhock-hued) kind over the *wardī*. Above this is the *alumar 'usfurī* (red saffron-coloured) kind which has the colour of bright saffron with a tinge of yellow. Then there is the *bahramānī 'usfurī* kind which is pure, and is devoid of any starchy colour. The yellow kind becomes progressively precious as the red colour becomes dominant until it reaches full redness. This is the *bahramānī* kind. All these stones possess different characteristics with respect to brightness of the colour, clarity, glitter, sheen, reflection, and purity from blemishes, and their prices go up according to these characteristics.

Nasr, while enumerating these kinds, says, "The *wardī mushamma* (waxed red) is the kind that is clear, glittering and rosy. The fourth kind is the *jamrī*, which is bright like a cinder. I am inclined to believe that the *khayrī* variety mentioned in Al-Kindī's book is actually *jamrī* which is bright like a cinder, and the copyist has made an error (God is the Knower). The *rummānī* kind is the one that ranges between the *wardī* and *jamrī* kinds.

Bahramān means the saffron, e.g., *thaubbahram*, that is, cloth dyed with saffron. The glitter which we speak of in connexion with the ruby is not saffron's lustre, as it is pale, and dry like flesh but that colour which is assumed by a liquid which has had its starch leached out, and which is the first fermented drink made from that liquor. Anything

dyed with saffron has its association with the pomegranate; and its wine (*jiryāl*) would be good only if it is pomegranate-coloured. As time passes the wine assumes a bouquet of different kinds. Sometimes the *jiryāl* is regarded as a synonym for saffron, as in the following verse by Nābighah Ja'dī:

I left the one with her clothes in such a state that it seemed as if her attire had been drenched with the colour of saffron.

The word, *jiryāl*, is also employed for *rāwūq* (old wine). At times this word is used to denote the colour and at others the bearer of the colour. As'hā says metaphorically about wine:

And the old Babylonian wine in the jar had the incarnadine colour of sacrificial blood, which I seized.

Khalīl bin Ahmad says that *bahramān* is a variety of saffron. If this is true, the *bahramānī* variety would be the best, as it would be a worthy attribute in the ruby. Sarī al-Raffā' in the *Kitāb al-Mashmūm* (The Book of Perfumes) writes that the word, *usfur*, is a Himyarian word. On the other hand, Hamzah holds *usfur* to be an Arabic variation of the Persian word, *haskfar*, as the *usfur* plant is known as *hask* and the safflower seed is designated in Persian as *haskdānālī*. Its *aqua* is regarded as a calamity, that is, it is the dragon's blood. Its blossoms are known as *bahram*, the Arabic equivalents for which are *bahram*, *bahramān*, and *bahramij*. It is this with which the clothes are dyed. I should imagine that the planet Mars is called *Bahram* in Persian because of its red colour. The saffron is called the *kusumb* in Hindīya. In the *Kitāb al-Mashāhīr* (The Book of the Celebrated) it has been mentioned that the forest-willow known as the *ranf* is the terrestrial *bahramij* which means that it is the terrestrial saffron.

Abu Hanīfah Dinawarī has said in his *Book of Plants* that *ranf* is a mountainous plant and is known as the *khilāf-i-Balkhī*. The foliage of the terrestrial *bahramij* tends to fold up at night and open up in the day. It is, in fact, a Persian word. One variety of its buds is very red and slightly pendulous.

As for Abu Hanīfah's statement that the leaves of this plant tend to coalesce with each other at night, it might be stated here, that they do not do so in the manner of the water-lily or mezereon. They are loose but droop.

Khilāf-i-Balkhī is known as the *sirishk* in Balkh. *Sirishk* is the *aqua* which is squeezed out of this plant. It is obtained by distillation when the *aqua* comes out drop by drop. Its foliage is smaller than that of the narcissus, although it bears resemblance to the latter in the sense that its leaves cling to each other in two rows. When the sun dawns, they come athwart each other, and when it sets they take up their previous position, as if they have faded. This is true of all the heliotropic leaves which re-

volve with the sun: only in some plants it is apparent because of the lack of humidity and in others it is latent.

As for the expressed juice of the saffron which Hamzah has equated with the dragon's blood lexicographers say that it is a reddish plant which occurs in deserts. It is said to be larger than the mandrake, i.e., *hurf*.³⁴ Its reddish colour has become synonymous for reddish plants. Other authors have held it to be the sappan wood, as its decoction is similar to the expressed juice of saffron. The poet, 'Ajjaj, says:

Blood seeps out of his throat, like the froth of the sappan wood in the sieve of the dyer.

Both the saffron and the sappan wood are thus compared to the blood. The leaves of the sappan wood are like those of the rue plant. It is sold in Khaybar under the name of *safīr* by being weighed in *tals*. One *tal* is equal to 100 *qātiyahs* and one *qātiyah* is equivalent to one *manā* and *rubā*.³⁵

One *tal* is equivalent to a gold piece weighing 38.5 *mithqāls* equivalent to four *dāniqs dhahbī*.³⁶ The gold at Khaybar fetches a value equivalent to half a Nīshāpūrī *dīnār*.³⁷

Some have called '*andam*' to be *ayda*'.³⁸ *Ayda*' is the fibre of the berry. Abū Hanīfah heard from a bedouin that it is a vegetable known as the *nīl*. Its buds are bright red and are known as '*andam*'. Abū Hanīfah says he has not heard it from anyone else. In the *Dīwān al-Adab* (Collection of Literature) it has been stated that '*andam*' is the dragon's blood. In Persian it is known as *khūn-i-Siyāwushān* (the blood of Siyāwushān) as it was the belief of the people of Irān that it grew out of the blood of Siyāwushān, the son of Kaykāus who was killed despite his innocence. The Hindiya equivalent is also quite close to it, as the people of India call it *Pāndurat*, that is, the blood of the *Pāndawas*. *Pāndawas* were a family, who waged wars with their paternal cousins, the Kurwās, and have become celebrated in history. Both sides lost a considerable number of men. 'Ajjaj says:

The nation has put on garments of blood. Trickle of the dragon's blood adorned their breast.

And further he says:

That lion of Khaffān upon whose neck and breast the dragon's blood has congealed and turned black.

There are several couplets of the like. There is no panegyric in Arabic literature that does not associate the dragon's blood with wine and blood. And yet there is controversy among them through ignorance as regards characteristics of the dragon's blood. All astrologers are familiar with the name of *Almagest*³⁹ since his book (i.e. Ptolemy's book) is a book of reference for them, and no more reliable book can be imagined. But they are unfamiliar with the meaning of his (its) name. Nor do they

know about the provenance of the word. In the event, it is not a Greek word.

Ibn Durayd writes about *urjuwān* that it is the Arabic equivalent of the Persian word. The colour (of the flower) is deep red, and it is also called the *qirmiz*. In an exaggerated description of the colour of a piece of cloth, it is said that it is *arghawānī* or *bahramānī*. The Persians call it the *gul-i-arghuwān* from which the Arab word derives. This blossom effloresces from a plant which does not grow profusely, the flowers are minuscule, red and wine-coloured. They are odourless and appear very graceful. Whether it has an Arabic or Persian cognomen, the people of Arabia mention it quite frequently. Thus 'Amr bin Kulthūm says:

As if their clothes were dyed in *urjuwān* or *urjuwān* was coated upon them.

Urjuwānian colour is specific to the Caesars, and it was prohibited for the common people in ancient times to wear clothes of this colour, who were led to believe that it contained the blood of the snail.

The people of Sūr learned about it having seen the snout of a dog which had fed upon this littoral animal and through which the colour of its snout had undergone a change.

Bān Yanāl Thanawī, in the account which he presented to the Sāmānian kings, had mentioned that the costume of the chief of the Qatā'īs was *arghuwānian* and so specific to him that none else was entitled to put it on.

Galen writes about the *kermes*⁴⁰ that it was caught from the sea when fresh and cool. This statement of Galen resembles the claim put forward by the Sūriāns.

We now return to our original discussion from which we had digressed for attaining greater understanding. Among the blemishes of the ruby which Al-Kindī has mentioned is the inner stain which, if too conspicuous and deep, cannot be removed. The other is the *khalt-i-hijārah* (admixture of stones) which is called *hurmulīyāt*. *Hurmal* (harmal or wild rue) is white. In Persian it is called *kunjdah*. Another blemish is that of *rīm*, i.e., a kind of dross that is like earth. Still another is that of a perforation which detracts from its clarity and transparency. This appears in the form of a crack which results from the collision of a vitreous object with something and the crack is so wide that water may pass through it. It is physical as well as temporary. Variegation in colour, e.g., greater in one part and less in the other, is counted as a defect. Cloudiness also deducts from the value of the stone. A pearl-like stain may be present on the stone on any part. This blemish is known as *asīn*. If not deep, it would disappear on rubbing the stone. There is no other way in which to do away with this defect, as it is rather deep.

According to Al-Kindī, the word *ma'dīn* is from *'adām*, meaning to

stay. The word is probably used to denote the long sojourn of the mineral in the mine before it is dug out. Or the word might also signify the persistence of the miners who keep on digging without getting disheartened.

Ruby mines occur in the island of Serāndīb (Ceylon), which is situated near the Indian Ocean. The mine occurs in the mountain adjoining the coast. It has been said about the red ruby variety that it is surrounded by a coating of stones like the pomegranate seeds are surrounded by their peel. This is not unusual, for the Badakhshānian ruby is also found enclosed in (a coating of stones) in the manner of the crystalline variety.

All the transparent objects are, in reality, the water that has become petrified. Although this process occurs naturally, many things found in it do not bear any relationship to it, e.g., air-bubbles, water drops, leaves of grass, slivers of wood, etc. We shall shortly describe the crystalline variety.

Every liquid, as long as it flows, requires a vessel to contain it, and to save it from flowing out and dispersing, till it congeals and stops flowing. The vessel then serves as its guard. This is a universal phenomenon known to all. How these liquids congeal and under what circumstances and how they assume different colours is not something one might attempt to guess by stretching the imagination. God is the Maker and the Shaper of these things.

There is another argument in favour of the above hypothesis. The ruby requires more heat for crystallisation and for achieving more glitter in its red for it is possible that there might be admixture in it of the violet colour, or we often find earth or sand or stones in it.

The jeweller, therefore, peels off the outer coat of the ruby, should these blemishes be near the surface until the blemish disappears although the weight of the stone is reduced, and the surface is no longer level. The depth of the blemish varies. If the blemish is too deep, he bores a hole so that the entrapped air is expelled, and the gem does not explode when heated. Possibly Abū Tamīm has implied this perforation in the couplet:

When all my praises ended at her door-step, I put the necklace of unperforated rubies on her.

Iqd means the necklace. Necklace made out of cloves is the *sinjab*. Ending of praises is the shower of gifts to the person commended. The ruby necklace denotes praise. Generally strings of rubies are put upon the hands, and the poet in return for the generosity shown by the hands of the person praised has adorned her (or him) with the strings of rubies. A necklace or string cannot be made without holes being bored into it, and the poet has compared his *qasīdah*⁴¹ of praise with rubies, by denying the presence of holes in the string, with the intention of moving to-

wards intellectualisation from similitude. He wishes to impress that the string is not comprised of rubies but of excellent verses, as Buhtarī says:

We are joining these pearls in a thread. Stitching an unperforated object is a strange thing indeed.

Wāwā Dimashqī says:

I see the threaders boring perforations in pearls. But, if holes have not been bored into them, how do they become organised?

The word, *ghayr muthaqqab* (unperforated) attests to (the stone's) being clear, pure, and free from the blemishes to which I have referred above, as well as to the fact that no gold joints were bored through them, for jointing gives rise to the suspicion that the stone has been subjected to wear and tear. The poet, therefore, has not employed the similitude of stitching of the stones together as it is impossible to join the stones without perforation. Nor is it possible for the necklace of stones to be put on without being threaded. Besides, once a heterogeneous object is brought in, the homogeneity of the original is adversely affected in its beauty. Thus we learn that for a necklace to be put on, it has to be bored and perforations are counted among the defects in a necklace, as they tell upon the noble characteristics of the jacinth. Abū Nuwās says in praise of wine:

I gave her a measure of five pints and a third of unperforated rubies in return for hers when I heard of her.

One of the dangers of the perforations is that they might be having poison in them equivalent to a grain of sesame. It is a dangerous habit upon the part of the jewellers to wet the stones with their saliva to remove the dust particles, so that they may glisten. I believe that the stories of suicides, e.g., self-killing in the jails by sucking pearls and stones in order to escape disgrace, belong to this category.

When Cleopatra, the daughter of Ptolemy, became apprehensive about her life and position through Augustus Caesar, she made two asps cling to her breast. She was found dead wearing her crown and supporting her head with her right hand. But she redeemed, nevertheless, her honour.

The perforations are either athwart the stone or filled with an object that would add to its burnish. Air can pass through the holes, but they do not add to the shine of the ruby as they are basic defects not contributing to its value. If on the other hand, the stones are filled with something that would increase their redness, this would be a kind of gilding for masking the defects of the stone. All these things are counted as defects. Sometimes this gilding is naturalistic, i.e., the colour of the stone is unpleasing and a bright red point appears upon it and spreads throughout the stone, making it beautiful.

In the Lapidary (*Kitāb al-Ahjar*) which is attributed to Aristotle (I

believe this ascription to be wrong) it has been stated that at times a red point appears upon the ruby and spreads through the stone. When heated, this red point spreads and adds to the beauty of the stone. If the ruby be dark, its darkness is dispelled through this treatment.

Jāhiz has narrated the incident of a gem which belonged to a certain person. It fell from his body and an ostrich perambulating nearby happened to swallow it. Only two persons belonging to the Manichean religion saw it gulp the stone. They came under suspicion and were given a thrashing. While one of them was being thrashed, the other pleaded his innocence. When it was finally discovered that both of them were Manicheans, the matter was further investigated. It was told by someone that the ostrich had swallowed the stone, but the Manicheans did not divulge the secret lest it be sacrificed. At last the ostrich was killed and its gizzard laid open. It was found that the stone had become lighter and its colour clearer and more beautiful. The heat of the gizzard had performed the function of fire. This incident gained wide fame. Imām Shafi'ī was asked about the (juridical) nature of the incident. The Imām said:

What else can I say about the owner of the stone except that if he is wise, he should kill the ostrich and take out the stone, and pay the owner of the ostrich a price that is equivalent to the state between its life and death.

Abū al-Qāsim bin Babak said opposite to what the poet, Abū Tammām had said:

He is covered with strings of pearls in between threaded rubies and pearls.

Al-Kindī writes:

I bought some stones which had been brought from India. They had not been cleaned by fire. When I heated them a very pleasing colour came out. There was a dark stone among them reflecting a little redness in its clear transparency. The other stone was slightly coloured. I melted them in a crucible for a period sufficient to melt 50 *mith-qāls* of gold. When both stones cooled, the one having a little colour gained transparency and became nearly pinkish. The other that was darkish assumed the form of the Serāndibī crystal. It was found by me to be smoother than ruby. The practice is, therefore, to roast the reddish kind so that the mixed colours are made to disappear.

Al-Kindī further observes:

It should be comprehended that once a stone has lost its redness, then it is not a ruby. But then not all stones that retain the red colour (on heating) are rubies, since iron is not a ruby, yet it retains its red coloration when roasted.

And further:

A ruby stone having been roasted is re-examined, and, in case it does not gain clarity, it is re-heated.

‘Iraqi traders possessing the dark kind, desire that it should fetch a higher price. They heat it in a crucible of the Sogdian bole and the roasting process results in its becoming lighter. All the orifices between the two crucibles are thoroughly plugged and the stones are heated in the crucibles which are specifically designed for heating gems. This process of heating is continued for a period sufficient to melt a *mithqāl* of gold. A poultice is applied to the stones for cooling them. The stone finally crystallises as a clear and transparent gem, and fetches a higher price. This practice is applied when the stone is rendered free from all kinds of concavities and orifices. A poultice of the bole from the mine from where the stone is obtained is then applied. This bole is admixed with ground clay kneaded with clarified butter and dried. It is then heated on firewood, the jewellers being fully aware of the length of time for the heating process. In the event, heating is carried on for an hour at the minimum and twenty four hours at the maximum followed by cooling. The stone is roasted again in case it does not clarify. As for the mine from where the ruby is brought it is said that it is situated in the recesses of the island of Serāndīb (Ceylon) at a place known as Naghz. It is mined from the mountains of that island as well. In the Indian language Serāndīb is Sanklādīp. *Dīp* is the generic name for an island. When I ponder upon the name it appears to me that the name designates a cluster of islands, that is, a mother of islands surrounded by several isles. The Arabs are accustomed to apocopation as in the following couplet by ‘Amr bin Ahmar:

He fell and turned his horse leftward as though the Sarandi sabre flashed in the hands of the furbisher.

The port of Serandib on the coastline is called Mundrī Patān and the Khurāsānians call it Madar Patān. It is the first frontier of the Kingdom of Chulah, the word Chulah being generic to every ruler of this region. The capital of Bijāpūr is situated to its north-east. Then facing Ceylon is Bagran, where the pale variety of ruby is mined. Further to the north is the region of Rung. It is here that the Mountain of Electricity is situated, and at the foot of it is the mine of the red ruby. The people of that region believe that it is the electricity which generates the red kind. It is not the electricity that bursts forth from the clouds having been imprisoned in it. It is a kind of mountainous fire which is always alight and leaps into big flames; hence its comparison with electricity. This light guides boats and ships at night just as beyond ‘Abbādān ships gain guidance from the fire coming out of the Kankawān wood or as the Alexandrian lighthouse serves as a beacon. During the day-time this light is seen in the form of smoke.

Mas'ūdī in his *Kitāb al-Masālik wal' Mamālik* (The Book of Routes and Kingdoms) has mentioned the mountains of Rāhūn and has said that it was here that Adam was made to descend. I should believe Rāhūn to be the Arabic form of Rūng.

Some authors have presented the following argument in support of Adam's descent upon this island:

The plants that grow upon this island at first grow to a certain height and then recline toward the earth a little. Later, they grow up and attain quite some height: in fact, the plants are akin to the camel's neck. This is because of the prostration performed by the angels to Adam.

But these people forget to note that the place where the orisons were performed was situated elsewhere and the place to which Adam was brought (from Heaven) is elsewhere. Al-Kindī avers:

Ruby is mined at Sahān, an island behind Serāndīb. Here there is a big mountain, called Rāhūn. Dust-storms and floods transport rubies from this mountain. The island is 720,000 cubits long and wide.

It is quite probable that the person who gave this information to Al-Kindī used the word, *khalf Serāndīb* (behind Serāndīb), and might have used the word, *khalf* (i.e. behind) for "beyond", although both words carry almost the same meaning. The dimensional sense of man uses both words interchangeably. But as far as islands are concerned, the word, *warā'* (beyond) is employed for a place that is at the other extremity from the centre, while *khalf* (behind) implies that direction where a larger portion of the sea is situated.

Nasr has also mentioned about this island but has given its name as *Mundrī Patān*. This city, as we have said, is situated on the coast and is not an island.

It is said that, when the sun shines upon the ruby, lightning seems to spark off and it is called the *barq-i-Rāhūn*. No one can go there, as that region is in the possession of an enemy. This is all fiction, and I shall narrate some of the fictitious stories held by the Irānians. This lightning appears after sunset and disappears at sunrise. The same kind of tale is told about the coastal mountains of Zābij, where the fire appears black during the day and red at night, and it is seen after several days' journey. Lightning is seen to spark off here as well. Al-Kindī says:

The rubies brought forth by the floods are better than those spewed forth by dust and mud.

This is not a matter to wonder, and it is quite possible. A similar story has been narrated by a seafarer.

We were once driven by the winds towards the mountains of Akhdar which is situated to the east of the Mountain of Lightning. The boatmen cast anchor and tied the boats. Here the seafarers saw the

fāriqūn tree which should be called the *sādhiq*. (Certain Greek names bear similarity to the word *fāriqūn*, although the Greeks call it *fulalan* too, and in Hindīya it is called *kandbīr*).

This seafarer further narrates:

Our servants went ashore and on return, said the place was extremely pleasant. The captain, having heard this, took with him the baggage he required for excursion, and went ashore. As he went further, he saw a reservoir surrounded by shrubs and an old man was sitting there. He presented the old man with walnuts, almonds, dates, etc. The old man went to his house and brought with him a box made of coir fibre. He took out from the box a ruby stone weighing more than a *mithqāl* and gave it to the captain in return for his gesture. The captain sent one of his men to the ship, and he brought with him several kinds of fruits, clothes, kerchiefs and salt. He gave these things to the old man, who then brought another piece uncut and narrow and weighing six *mithqāls*. When the captain enquired from the old man where he had obtained these things. He clasped his hand and took him towards a desert, and said: 'These stones are brought by the rain floods, but I do not pick them, as I do not need them. I am an honest and God worshipping eremite.' He then made a promise to the captain that he would collect the stones for him so that he may take them whenever he cast anchor upon this place. But we could not meet the man again.

This incident shows that the valley was inundated by the flood water coming from the ruby mine.

Likewise, in the *Book of Storage*, which describes incidents about the Chinese, it has been said that rubies of different colours are washed from the shores of Serāndīb and are especially to be seen during high tide. Water brings them from hollows, caves, and flooded places. The places to which the ruby stones are brought are guarded by sentries of the king. And, therefore, Bukayr Shāmī has said:

The sword instils fear because of the sharpness of the blade, not through the beauty of its scabbard.

Abū Bakr al-Khwārizmī says:

Thou art doubtless from men. Pearls and the unique pearl have their gestation likewise in the seawater. Thou livest with men like the precious stones and emeralds that lie embedded in mountains.

Sometimes, when a precious stone is mined from its site, stones are found clinging to it. These are broken down. In India, among the edible cereals, e.g., rice, lentil, and *māsh*⁴² is another cereal called the *kalt*. It is dusty and khaki in colour, and assumes the shape of *kamarsanah* and *julbānah* when squeezed by the fingers and made soft.⁴³ It then becomes lentil-like. People do not eat it as it is large. It is a powerful lithontrip-

tic.⁴⁴ This characteristic of the plant is mentioned in books. It is said that it not only breaks down the stones of the gall-bladder but also the mountain stones. When people are on the lookout for rubies and reach a place in the mine which is difficult to pulverise, they place a decoction (of the seeds of this plant) on the spot, allow it to remain there for a specified period and then it becomes easy to break the rocks. This process is akin to the one followed in respect of gold and silver mines where wood and oil are burnt.

The ruby, on account of its hardness, is superior to all stones, and only the diamond exceeds it in hardness. No other stone except the diamond can cut it, and the diamond too, at best, abrades it; it does not break it. Al-Kindī writes:

The ruby stone is burnished with a moist calotropis branch as is the practice followed with other stones. The method followed in burnishing it, is that a copper foil which has been moistened with the lime water of the Yamānī shell is rubbed with water and the Yamānī-an shell is calcined like lime. Before rubbing, however, its surface is made uniform and smooth with the emery having been placed upon a leadstone. Sometimes it flows towards the water placed below the stone. Rubbing is continued upon the copper file for a month if greater burnishing is required.

He further avers:

Lustre is one of the characteristics of ruby. The ruby that is clear and burnished will give off lustre. This is the reason why it is often compared to the plane-tree blossoms which are red, flame-like and are likely to convert into ash after a long time. Hence Poet Rā'ī says:

Red jewels and ruby stones glisten like the clusters of plane-tree blossoms which grace the neck.

The jewellers of our day say that the *rummānī* variety of the ruby which is very precious passed into the possession of the ruler of Serāndīb. The *rummānī* stones are the fragments of that stone, while the inferior varieties are earmarked for the traders. It is because of this that the *rummānī* variety is no longer brought into our lands and whatever *rummānī* variety is found is of the old times. Ptolemy in his *Geography* writes:

A reddish mountain surrounds the ruby island. This mountain rises up from dry land and encircles it. In between this valley are cities, springs, and rivers.

From the area of the island as given by Ptolemy it seems that this island is situated at the end of the populated (segment) towards the east and near the Equator. But he has not written anything that would show the presence of a ruby mine there, or that it is called the Red Mountain because of the incarnadine characteristic of ruby. Nor have I come across

any person who would tell me about it. At times it so happens that the name of a thing follows from an object which is not found in it. And island is so situated in the Black Sea within the circumference of islands. It is in Zābij and lies in the direction of Jāvah (Java) and Dīwah.⁴⁵ It is called the Ruby Island, although no ruby is mined there. It is so called because the faces of the women of this island are extremely beautiful. The same thing is true of the women of *Ghubb al-Qamar*, so called because it is rounded in shape and it is subject to high and low tides.

The word, *Ghubb*, denotes a place at which the sea overflows the land. Ships tend to avoid such places as the water here is shallow. *Jazr* is the place where the water from the sea flows and recedes, and the mouth for the entry of the water is wide. Some have called *Jazr* to be the opposite of *Ghubb* and have said that *Jazr* is that neck-like projection of the land which intrudes into the sea. But this is erroneous.

One jeweller has narrated that the king of this island had sent to Hajjāj bin Yūsuf, women who were born Muslims but whose parents had died. They were, therefore, orphans. The Rājah (of this island) wished to obtain the good wishes of Hajjāj. (The ship carrying these women) was pirated by the Mayds, who were pirates from Daībal, operating pirate-ships. (The *bawārij* in the language of these people are called the *bīrah*, that is, boats). The women were abducted. One of the women belonging to the tribe of Banī Yarbū' cried: "O Hajjāj! O Hajjāj!" When he heard about her agonised cry he replied "Yes." In much the same way, the widows (of Muslims) from the frontier (of the 'Abbāsīd Caliphate during the 'Abbāsīd - Byzantine war) had called out to Mu'tasim, and the 'Abbāsīd Caliph had cried back: "Here I come." Hajjāj wrote to Dāhir bin Chach to return the women. Dāhir ignored the request and instead wrote back: "I cannot retrieve them from the pirates." Hajjāj sent Muhammad bin Qāsim bin Mubinnah⁴⁶ to the frontiers of the Umayyid Caliphate which borders on the frontiers of Sind. At that time he was only seventeen. Muhammad bin Qāsim wrote to Hajjāj that he could not find any vinegar, whereupon Hajjāj had corded cotton dipped in old and sharp vinegar and dried under shade till all the vinegar was absorbed. When ready, Hajjāj sent it to Muhammad bin Qāsim with the instructions that it should be dipped in water and cooked. Muhammad bin Qāsim fought and killed Dāhir and occupied Sind. The capital of Sind was Bamhanava.⁴⁷ The Persians called it Bamanabad. The astronomical table of Arkand calls it Brahmanābād. When Muhammad bin Qāsim entered the city as the conqueror, he said: *Nasratu* (I have been graced with victory). The name of the city, therefore, became Mansūrah. Then he turned towards Multān and subjugated it. When he made his triumphant entry here, he said: *Umritu* (I have prospered). The city, therefore, gained the appellation of Ma'murah. But this name did not gain the

same currency as the name, Mansūrah. Instead the city became known as *Farj al-Dhahāb* (The Frontier of Gold). This name has its origin from a room ten yards long and eight yards wide, which was locked and sealed. Gold and other valuables were passed into it through a hole which was bored in its roof till it was full of gold. The Arabs began to call it the Frontier of Gold. It contained a wooden idol too. It was sheathed with red leather, and there were two precious ruby stones that served as its eyes. The name of the idol was *Adit* (the Sun), and Hindūs from distant places came to worship it, dedicating precious objects and money to it. Muhammad bin Qāsim did not disturb the idol, as he did not wish to provide any cause for grievance to the Hindūs. But Hakām bin Shaybān by the time of Muqtadir bi-Allāh had it broken into pieces, as a conflict had broken out between him and the worshippers of the idol. Hakām got the treasures removed.

Prices of Genuine Jewels

The prices of jewels are not stable. There is no law governing their prices, and there is no reason why these prices should not fluctuate with time and place. Each country, each nation carries its own temper. Furthermore, at one time nobles begin to sell them off and at others, to stock them. Stones are plentiful at one time and scarce at another. God grants honour to some and disgrace to others. We shall be describing the prices of these jewels in relation to our own time and the period that has just preceded it, as also to the city of Ghaznah and its environs. As regards gold, we shall adopt the *Hiratī* standard, as the prices of jewels are determined by means of this standard. Should we come across any other information, we shall also provide it.

The ancients say that the price of a *mithqāl* of the *bahramānian* variety of ruby is five thousand *dīnārs*, and a higher price cannot even be imagined. Half a *mithqāl* fetches a price of two thousand *dīnārs*, while the *bahramānian* variety weighing two *mithqāls* is priceless, and its price cannot be computed. It is up to the purchaser to fix its price.

The jewellers of today price the *rummānian* variety of ruby, which is of deep colour, free from perforations, blemishes, cloudiness, and admixture, and is, additionally, level, square, or elongated (as these are the designs that are popular), as the best. This is followed by the *midrābī* (arched) variety, the lower part of which is like the anvil. Such a stone is characterised by all the desirable attributes. They compare it to the *Najm* (the plant). If the comparison has any truth, then the *Najm* should be called the pearl (*lū'lū*). One *tass'uf*⁴⁸ of this stone costs five *dīnārs* and a weight twice the above two times this price. One *dāniq*⁴⁹ would cost 50 *dīnārs*. By *dāniq* I mean one-sixth of a *mithqāl*; the price of

twice this is four times higher. One *mithqāl* costs a thousand *dīnārs* and one *mithqāl* and a half, two thousand *dīnārs*.

Jewellers claim that they have not seen a bigger ruby incorporating these characteristics. In addition, a ruby weighing one *mithqāl* is rare like the excellent variety of the pearl of this weight.

One *dāniq* of ruby exceeds the price of one *dāniq* of pearl. The present-day jewellers claim that the *bahramānian* variety which has already been described is of a lesser grade than the *rummānian* variety. Its price is 800 *dīnārs*. The *Arghawānian* variety fetches 500 *dīnārs*, while the *najmīan* and the *gulnārian* varieties each cost 100 *dīnārs*. The rose-coloured variety also fetches approximate prices. With the exception of the *rummānian* variety, all the ruby varieties have, on rare occasions, been found in weights of 20–50 *mithqāls*. Al-Kindī observes:

I have seen the largest piece of the red variety weigh one *mithqāl* and a half or a little more. As pieces of fiction, we have been told of this variety weighing ten *mithqāls*. Of the *wardī* variety, the largest piece which I have seen weighed is 30 *mithqāls*.

Nasr states:

The beauty of the ruby depends upon the depth of its colour, the perfection of its clarity and brightness, refulgence, and its purity.

Taking this as the standard, the rise in the price of a ruby is dependent upon these attributes. The *bahramānian* variety is the most precious, followed by the *ʿusfurī*, *jamrī*, and the *wardī*. Everyone knows that the *wardī*, *muʿasfarī*, and the *lahmī* (flesh-like) varieties, because of their varying colour, comprise different varieties. The *wardī* is totally white. Another of its variety is slightly reddish, with the redness gradually increasing till it assumes the rosiness of the cheeks, increasing to an extent that it becomes reddish like the red anemone and a little blackish.

In order to establish the value of a ruby, people coin different similes and metaphors for it. Those keen upon comprehending the attributes of the ruby should describe its kinds, attributes, habitat and characteristics.

I have come across a book written during the reign of ʿAbd al-Malik bin Marwān. It has described several points about the art (of jewellery), and prices of that age have also been given. The book shows that the price of the black variety of ruby was equal to that of two race-stallions. I shall draw upon this source book whenever necessary.

Ruby-Like Gems

One of the stones resembling the red ruby variety is *karkind* or the *yāqut-i-asamm*, meaning the hard cornelian, so named because it happens to be solid, less clear, and turbid. This stone does not fetch a higher price than the dusty ruby variety.

Al-Kindī writes:

Of the different varieties of *karkind*, the best variety and one that bears resemblance to ruby is the *usfurī* variety which is known by the name of *sindiya*. It gives off a little light. There are some varieties enclosed within leather pouches: these are the softest and the most inferior in kind. These are followed by the one that is like salt. It cannot be imparted any shine or gloss and is the worst of the *karkind* variety.

There is a ruby-like variety which is to be found in ruby mines. It is designated as *kuriba*. It is malcoloured and brittle, but looks good. Being soft, it yields to *karkind* and the latter can break it, although *karkind* is not more beautiful than this stone. It has also hierarchical orders like the ruby. At times even experienced jewellers, because they have not taken the trouble to examine them, take them to be rubies.

Gurbuz not only bears resemblance to the red ruby it also bears different colours on the pattern of the ruby. Hamzah, while describing it, says: "It is a kind of jewel which appears to be the ruby, although it is not the ruby." The Arabic version of *gurbuz* is *jurubz*, and therefore, a practitioner of deceit is called *gurubz*, *jurubz* and *gurg buz*.⁵⁰

Al-Kindī, while describing the cornelian-like varieties, has also mentioned *aflah-i-ahmar* which also is liable to deceive the experts. Whatever we have copied from Al-Kindī's book is based upon hearsay. It is better to admit that the manuscript of his work which we have in our possession is in an impaired state.

Nasr, writing about ruby-like varieties, observes: "There are four kinds *karkind*, *karkahan*, *juzbuz*, and *Bijādhi* (which is gold-coloured) while the most lustrous kind is the *sindiya*. It is yellowish-red, and, on being heated, takes on the colour of the ruby. Some are salt-coloured and do not accept gloss. One variety is that of *ablaj*, which is different from cornelian in that it is softer. It is this variety which is called *aflah* by Al-Kindī and which we have just described.

Nasr writes: "*Karkahan* is reddish with a darkish tinge. It only shines in the light, and cannot bear heating on fire. Its appearance is like that of the saffron-like ruby. It is *khuluqī* (aromatic), *zayti* (olivine), *fustuqī* (pistacio-like) and *āsmanī* (azure). These colours begin to gleam when the stones are turned upside down as they do in the chameleon. The yellow kind gets included in the *usfurī* ruby's beads, the only difference being that it is not glossy and does not accept polish. With the exception of *ablaj*, all these stones are mined from ruby mines. *Ablaj* is brought from Serāndīb. *Juzbuz* is the most glossy and resembles the *bahrāmānī* variety in colour, gloss and shine so as even to deceive the expert. It can be distinguished only by rubbing and heating over fire. *Bijādhi dhalībī* is a ruby of *Badakhshan*. Those who possess expertise can recognise it from

its colours, as the brightness of the ruby is comparatively rare in it."

"As for the difference in the colours of the two stones, it has been said that the ruby is clear and transparent like fire, while the *biḡādhī* kind is like the smoky fire. The same thing is true of *karkind* and *ablaj* which do not have the lustre of ruby. The stone resembling ruby most is *juzbuz*, and *sindyā* is more akin to *karkind*."

The best test that can be had with respect to pure ruby which can affect other stones through its heat, is to abrade them. When rubbed the ruby is not affected but the stones are.

Al-Kindī (further) writes: "Ruby-like stones were purveyed in the earlier times as ruby stones and fetched the prices of ruby. Ayyūb al-Aswad al-Basrī used to sell *karkind*, *juzbuz* and *aflah* to Al-Mahdī for thousands of *dīnars*, calling them rubies. 'Awn al-'Ibādī of the tribe of Banu Suhīm apprised Mahdī of the deceit of Ayyūb, and told him: "These *ashibah* (ruby-like stones), if thrown over fire, will not be able to withstand it. The red ruby, if heated on fire, becomes more beautiful". When Mahdī, following this advice, had the *ashibah* incinerated, three *mithqāls* of *karkind* and five *mithqāls* of *aflah* were burnt up.

Stories About Rubies and Jewels

Jewellers narrate the tradition that the ruler of Serandīb has a ferrule of ruby, somewhat like the clasp of a knife. He keeps on twirling it in his hands. Its weight is 55 *mithqāls*. No one has so far mentioned a larger piece of ruby. I have heard the following story:

A large ruby piece which was sheathed was located among sand-stones. When the sheath was removed, the stone was found to be cruciform. Stripped and heated, it was sent to the Roman emperor who purchased it at a high cost and had it affixed in his crown.

The authenticity of the story is, however, in doubt. If there is any truth, it is somewhat like this:

It is said that the Emperor Constantine, the Great, embraced Christianity because he saw a comet in the sky. The comet looked like a crucifix, which the emperor made as the symbol of his emblem. This is the reason why he prevailed over his enemies, though he did not possess the power to fight them.

In the *Akhbār al-Khulafā'* is narrated the following incident:

One day the Caliph al-Mutawakkil held court to collect and receive the gifts given to him by the nobles on the occasion of the Nawrūz festival. All kinds of precious jewels were presented, till at last Bakht Yashū, his physician, with whom the Caliph was on very intimate terms, appeared. The Caliph consulted him about the gifts he had so far received. Bakht Yashū replied: 'These gifts are like the shells carried by mendicants. All of them are of trite value. Just have a look

at what I have brought.' Having said this, he raised up his sleeve and brought out a gilded ebony box. When the green *harīr* silken cloth was removed, a big spoon carved out of a precious stone with designs of comets shining on it was seen. The spoon was placed in front of Mutawakkil. The Caliph, never having seen such an object, asked where he had got it from. Bakht Yashū' replied that he had received it from kind and beneficent people. And then he added: 'This spoon reached my father through Umm Ja'far Zubaydah. My father had treated her thrice, first for throat disease which could have grown to cynanche. My father suggested blood-letting and as a refrigerant and sedative prescribed *harīrah*. The *harīrah* was brought to the queen in a china dish having a large spoon which upon the command of my father, I took and hid within my robe. The servant tried to snatch it from me. But the queen intervened and asked him not to recover it by force but by persuasion, and to offer me 10,000 *dīnārs*. I did not agree. My father at last said: 'Your Exalted Majesty! Never before has my son pilfered anything. Do not disgrace him upon his first theft lest his heart gets shattered'. The Queen at this laughed and the jewel since then has belonged to me.'

Although in this story the jewel has not been specifically described, from the description of its rays it would appear to be *yāqut-i-ahmar* (red ruby).

Mutawakkil then asked about the disease. The queen had complained to the physician that a lady-in-waiting had told her about halitosis which she had developed, and that she would rather die than suffer from halitosis. Bakht Yashū's father starved her till the evening and then fed her with fish cooked in vinegar followed by the drugs of the date liquor. This was repeated for three days. On the fourth day the Queen was asked to enquire from the person who had pointed to her halitosis to tell her whether her mouth smelled or not.

The third ailment the Queen had was the continuous hiccups which had reached a dangerous point. Bakht Yashū's father ordered that large earthen crocks be placed in the courtyard and filled with water. When Bakht Yashū's father clapped all the crocks rolled inwards, and the weird sound created made the queen run through fear, curing her of hiccups.

There was a glut of jewellery towards the end of the Banū Umayyad and the early days of the 'Abbāsides. It has been said that utensils were made of jewels and precious metals. This is why Imām Shāfi'ī has written in the *Kitāb Harmalah*: "The use of crystalline and ruby vessels is not permitted, as they are costlier than gold, and there is greater extravagance in them than in gold."

But in the *Kitāb al-'Umm*, Imām Shāfi'ī says: "Their use is permit-

ted, since the Shārī' (the Holy Prophet) has only prohibited gold and silver." A person coming from 'Irāq narrated that Abū Tāhir bin Bahā' al-Dawlā, who was first the Governor of Basrah and later of Baghdad, had a large ruby piece which was set in gold, and which he used to call the *jabal* (the mountain). Probably it belonged to Fakhr al-Dawlah also, as the jewel he possessed was similar.

Hasan and Husayn were two brothers and both belonged to Rayy. They have mentioned that Amīr Yamīn al-Dawlah Mahmud, God's mercy be upon him, showed them a ruby which was as big as a grape. Its weight (price) was estimated by both brothers to be 20,000 *dīnārs*. The Sultān agreed with this appraisal, and said: "This jewel belonged to Rājah Tirochanpāl who had it pawned to a local jeweller for 400,000 *dīnārs*. Had I not 20,000 *dīnārs*, it would have been impossible for me to have it released." This jewel was not equal in size to one and a half *mithqāl* or *mithqāl-i-rummanī-i-murraba'* which we have already described and which was called the *rajam*.

About the Chulah emperors, it has been said that they had a large ruby which was fixed to the mounting block. This block was lifted by two men so that the king while mounting would step on the jewel. They placed the block underneath the canopy and the *rajam* could thus climb on to the horse.

Hasan and Husayn state that they had purchased for Amīr Shahīd Mas'ūd (may God exalt his rank because of his martyrdom), while he was staying at Rayy and Kohistān, a red ruby which was large and leonine in shape for 7,000 Nīshāpurī *dīnārs*. Some people believe it to have been the *jabal*, and were possibly right. Its master was the black vizier, the brother of Qabūs, since he had taken it from his brother as part of his inheritance. It is said that its shape was lion-like. If pressed within the fist, it protruded from the thumb and the small finger.

There are legends about Serāndīb also. It is said the ruby mine there was very carefully guarded and no one had access to it. Nevertheless, a man who stole stones from the mine adopted the following ruse. He got his head shaved and had a brass cap which was sieve-like in structure made for himself. It was so designed that it could accommodate the stone at the back of the head. He kept the sieve on till hair grew upon his head in such profusion that the sieve became invisible. He took a staff, and pretending to be a half-clothed beggar, walked with the help of the staff out of sight of the watchmen.

In Khawarazm I personally saw the gifts presented each year to Amīr Yamīn al-Dawlah. One of the gifts was a clasp made of red ruby. If clasped, both its corners protruded from the upper and lower sides of the fist. It was a hard stone. Later on I thought it might have been *karkind*, but I could not be certain.

There was a long ruby in the treasury of the ('Abbaside) Caliphs which was crooked at the top like the sides of a bugle. It was called *'anqā* and its weight was 21 *mithqāls*, with its bill weighing 15 *mithqāls*. It is said it was made in the shape of a bird out of a red ruby, and its beak was yellowish. It was a wonder of its age. Nasr states about its bill:

It was a gem which weighed two *mithqāls* less one *ḍāniq*, and it was superior to the *jabal* in colour and lustre." Nasr has not mentioned why the jewel was named *minqār*.

Nasr further writes:

Muqtadir bi Allāh's aunt had a stone which was called *warqat al-ās* (the myrtle leaf) since it was equal to the myrtle leaf. It weighed two grains short of a *mithqāl* and its price was 60,000 *dirhams*.

Another stone in the treasury of the Caliphate was a red ruby designed like an ocean. It weighed 28 *mithqāls*. It was slender and deep enough to permit water to be drunk from it.

There were several stones, named and unnamed, in the treasury of the Caliphs as these jewels were acquired by the Sassānids and were in the treasury since the time of Ardashīr bin Bābak. They passed from one king to the other till the Arab conquest and finally were acquired by the new government and the new rulers.

It is quite well known that the Pious Caliphs had no love for jewels and had them distributed among the Muslims. This also was the case with the Umayyads and the Banū Marwān, as their government was Arab, and with the exception of one or two rulers, none of them was arrogant. Jewels were, therefore, distributed in their time and their treasuries were full.

Then all of a sudden the 'Abbāsides appeared. They were like locusts, eating away all that their hands could lay upon and grasped the acquired wealth fiercely. Their sight falling upon jewels, they were consumed with the desire to own more and planned how to replenish and enhance their stock. Till Muqtadir bi Allāh's time the stock went on increasing. Muqtadir was dominated by his mother and he kept company which was not worthy of him. He was all the time in the company of women and wallowed in lust and concupiscence. He, therefore, like a robber burgled his own treasury. When money was exhausted, he began to withdraw the jewels which he had lavished upon his mistresses. He, however, was afraid of his vizier, 'Abbās, and in order to placate him, tried to make him a partner in the robbery so that he might also become blinded by greed. He sent large quantities of jewels to him, but 'Abbās returned all of it, saying: "(These jewels) are the grace and instruments of the Caliphate. Their distribution is not advisable." Muqtadir felt ashamed, and was suspicious of him thereafter.

‘Alī bin ‘Isā who had returned from Makka where he had been exiled after being forced to relinquish his ministership, happened to meet Muqtadir one day. During their discourse, the conversation turned to the dining set which Muqtadir had bought for 30,000 *dīnārs* from Ibn Jassās. When ‘Alī enquired about it, Muqtadir bi-Allāh said it was kept in the treasury. ‘Alī asked it be shown to him. Muqtadir on enquiry could not locate it. ‘Alī took out (a jewel) from his sleeve, and said: “This was purchased by me in Egypt. If this is the state of affairs with regard to jewels, may God save other things.” Muqtadir felt the negligence and accused the chief storekeeper, Zaydān.

The mother of Muqtadir was proverbial for her miserliness. We will give an account of his mother later. Sādiq said [in his verse about unworthy among women]:

May God so will that the world would come to an end when unworthy ones become rulers.

Good-bye to the world if for a single day they rule the world.

If you wish this adage of Sādiq to be verified, look at Zubaydah who among women possessed great virtues and qualities of nobility. Her rosary, however, was made of the *rummānian* ruby, its beads being large like nuts with melon-like streaks running through them. If people see a ruby of that kind, they remark that it is like Zubaydah’s stone. She had her pearls drilled so that her maidservants might wear robes strung from them. Stories about her pet monkey, its death, funeral prayers, and elegies (moving the queen and her entourage to fits of weeping) are all fantasies. We will not narrate these stories out of reverence for her. How can any one after Zubaydah be trusted, especially the one who is not worthy of the dust of her feet?

The (‘Abbāsīd) Caliphs before Muqtadir also made inroads upon jewels but not to such an extent that they would exhaust them and be held reprehensible. Hārūn al-Rashīd had a maidservant who was peerless in beauty. When Hārūn al-Rashīd used to present gifts to the maidservants she used to return them. Hārūn was annoyed by her attitude. One day, it is related that Hārūn gave precious jewels to the maidservants. All of them accepted them except this particular maid. Hārūn sent for more jewels, and asked each maid to take the jewels she fancied. All of them picked the jewels of their choice. This maid, however, did not. Hārūn at last enquired why she did not make her choice. The maid replied: “Your Majesty, if it is necessary to do so, I shall.” This said, she stood up, advanced further, and, clasping Hārūn’s hand, said: “Of the worldly jewels, this is the jewel I have picked.” Hārūn was greatly moved and he christened her Khālisah. From that day he lavished the largest number of gifts upon her. Abū Nuwās went unrewarded by Hārūn for a long time. He composed the following couplet:

My verses have been wasted upon thine door, just as the jewels of Khālīsah have forfeited all their value.

When Khālīsah heard about the couplet, she complained to Hārūn al-Rashīd. Hārūn sent for Abū Nuwās and asked him: "O wretch! how dare thou do this?" Abū Nuwās said the fault was that of the narrator who took *hamzā* in the verse to be *ayn*.⁵¹ Hārūn feigned belief in what Abū Nuwās said, so that the poet should keep his dignity and the person offended should have the offence removed. How could Hārūn al-Rashīd, so well versed in poetry and language, be deceived?

A similar kind of tradition pertains to Caliph 'Umar bin al-Khattāb who would ignore the verses of Hutay'ah who was instead countered by Zabarqān (the Companion of the Prophet). Hasān bin Thābit intervened on this, occasion, but Caliph 'Umar wished to lop off the poet's tongue (=silence him) through kindness. Caliph 'Umar and other noblemen have practised the precept of the Holy Prophet that the poet's tongue should be silenced through kindness. Caliph 'Umar always ignored the poets when he saw them straying in the wilderness of absurdity. See how 'Ubaydullāh, the vazir of Mu'tadid, ignored the vile outpourings of 'Alī bin Bassām who said on the occasion of the death of one of 'Ubaydullāh's sons:

O Abū al-Qāsim, ask the repository of mankind's hopes to witness the vicissitudes of Time.

Thy able and accomplished son died, while thou, a vile creature, liveth.

Thine life is worse than death – Indeed, thou art the target of misfortunes.

When 'Ubaydullāh heard about these verses he had Bassām sent for, and asked him why he had uttered these verses. In order to avoid further controversy, 'Alī recited the following couplets:

Tell, O Abū al-Qāsim, the repository of man's hopes that no one can forestall death.

He who is gone is gone, and his going is great trouble.

Death, sparing thee, has taken away thy substitute.

This theme has been borrowed by Bassām from Ibn al-Mu'tazz who had offered the following verses as elegies upon the death of 'Ubaydullāh's son:

Let the Vizier be told that Time and its vicissitudes are alike, and for all of them there is a fixed period. Thou didst cause loss to the age, while (the fate of) Abū al-Husayn was decided upon. And thou wert a gainer.

When 'Alī bin Bassām returned from the court of 'Ubayd Allāh, he spoke these verses out of sheer malice:

Send this message to the Vizier, and call: "O thou that hast seen twin

misfortunes. The beneficent has died, and Abū al-Husayn, the possessor of depravities, still lives. Sore of heart art thou and criest over him. His life is like to his death. Therefore, beat thine own head with both hands.

His first verses became very celebrated and proverbial. People began to recite them as proverbs and chess players unconsciously began to hum them. Ibn Hamdūn narrates:

One day I was playing chess with Mu'tadid bi Allāh. 'Ubaydullāh came to seek permission about something and went away. When he had gone Mu'tadid recited the hemistich (*hayāt Hādihā kamawt hādihā* = his life is like his death). He was humming this and throwing the dice. 'Ubaydullāh Abu al-Qāsim had to come in again in connexion with some other work. Mu'tadid was not aware of his coming and went on humming the hemistich. I, however, tactfully signalled that 'Ubaydullāh was in the room. Mu'tadid lifted his head and saw 'Ubaydullāh in the room. Mu'tadid felt so ashamed and humiliated that his face reflected his shame and disgrace. At last he said: "O Abū al-Husayn, why dost thou not chop the tongue of this speaker of gibberish?" (Humiliation had forced the Caliph to address 'Ubayd by his paternal name). 'Ubaydullāh, thinking this to be the appropriate opportunity hurried away from there, and reached his home. He sent for Ibn Bassām in order to achieve tranquillity of his heart. When I came to know of this, I became dizzy, my hands became palsied, and tongue disorganised. I was afraid lest Ibn Bassām be punished. When Mu'tadid enquired what had transpired, I said: "Commander of the Faithful! Abū al-Qāsim is being consumed by his own fire and I am afraid he will have the tongue of Bassām chopped off in his present state of frenzy. Bassām is among the great poets, and if this happens, it will bring disrepute to you." The Caliph sent for Abu al-Qāsim and asked him what he had done to Ibn Bassām. Abu al-Qāsim said he had sent for a friend of his to chop off Ibn Bassām's tongue. The Caliph thereupon expostulated: "We had wished that you should be kind and generous to him so that he may compose encomia instead of lampoons and satires". Abū al-Qāsim said: "Commander of the Faithful! Were you better acquainted with him and heard his verses, you would have allowed me to cut off his tongue." Mu'tadid smiled, and said: "It was because of such people that we had ordered the dilapidation of Buhayrah. Call him and donate to him 300 *dīnārs*. It would be better thus for us than that we should have his tongue cut off". And Ubaydullāh did as he was told, gave the poet money, and had him appointed at the despatch post of Saymarah, where he retained his position till the last days of Mu'tadid's reign.

Mu'tadid had alluded to the incident of Buhārah. The Caliph had ordered the construction of a building surrounded by gardens. He had already spent 60,000 *ḍīnārs* upon it. He lived there with his odalisques. One of his favourite odalisques was Dhurayrah, and it was about her that Bassām wrote:

Having left thy subjects destitute and worried, thou hast ensconced thyself in Buhayrah.

Sitting there, thou playest upon the tambourine with Dhurayrah.

When these verses reached Mu'tadid, he pretended that he had not heard them. Instead, he ordered the building to be brought down.

We now return to our earlier description of *jabal*, the celebrated jewel after which several later ones have been named. It was a beautiful, red ruby. Ibrāhīm bin al-Mahdī has said he had bought it from his father for 300,000 *ḍīnārs*. It was multilayered like a mountain. Mahdī gave it as a gift to Hādī who in turn donated a ring to Hārūn al-Rashīd. This ring was known as *Ismā'īlī* and had an emerald gem unique in the world. It had a hole, and a long search was made for something similar to it in order to plug the hole. At last he got what he wanted. The jewellers designed the ring in his very presence and the material was plugged by means of gum-mastic.

One day Hārūn was gazing at the ring, keeping it on his palm, to see for himself how the original and the plug matched each other. A fly sat on the ring and flew away after a while. The sawdust clung to its legs. Hārūn al-Rashīd said: "Verily has God truly said that the seeker and the sought are both false."

When Hādī became caliph and Hārūn called upon him, he had the *Ismā'īlī* upon his finger. Hādī became jealous, and wished that the *Ismā'īlī* should pass into his possession, as the *Jabal* had come to him. When Hārūn left the court, Hādī sent Fadl bin Rabī' together with Ismā'il the Negro to get the ring from Hārūn. In case he refused to part with it, he was to be beheaded. Fadl bin Rabī' met Hārūn and narrated to him his mission. Hārūn swore he would present the ring to Hādī with his own hands. Having said this, he returned with Fadl bin Rabī' till they both reached the bridge. Hārūn disengaged the ring from his finger and, accosting Fadl bin Rabī' asked him: "See for thyself, O Fadl, whether this is the *Ismā'īlī*?" Fadl replied in the affirmative, whereupon Hārūn flung it in the Tigris. Hādī did everything within his power to fish it out, but failed.

When Hārūn ascended the throne after Hādī's death, and a year had passed, the memory of Mūsā al-Hādī's search for the ring began to haunt him. He commanded Fadl bin Rabī' to search for the ring. Fadl bin Rabī', however, pointed out that it had been searched for many a time and by now it had possibly settled under more than four yards of dust.

However, Fadl bin Rabī' again took a team of divers to look for the ring. One of the divers told Fadl bin Rabī', "Please be good enough to take your place where the Commander of the Faithful had stood (when he threw the ring into the river), throw an ear-ring equivalent to the size of the ring which the Commander of the Faithful had thrown." Fadl bin Rabi did as he was told, and the diver made a dive in the direction of the ear-ring reaching the bed of the river. At last he recovered the ring and Hārūn became the owner of the *Jabal* and the *Ismā'īlī* ring. Hādī had yearned for both, but fate had willed otherwise.

Nasr has said that the stone of the ring was *bahramānian* saffron, and weighed three *mithqāls* less than one *dāniq*. Its price was a thousand million *ḏmārs*.⁵²

Hārūn was very fond of collecting jewels. He commissioned and sent Sabbāh, the jeweller, to the Rājah of Serāndīb for the purchase of precious stones. The Rājah gave him a cordial welcome and took him round the storehouse of his jewels. Sabbāh examined the stones closely, turning them upside down. He could not hide his surprise at the beauty of the stones and their symmetry, till he caught sight of the red ruby. He had not seen its like in the royal treasures and he was seized with wonder. The Rājah, becoming aware of the jeweller's wonder, asked him whether he had seen the parallel of it anywhere. To this the jeweller replied in the negative. The Rājah thereupon asked: "Couldst thou assess the price of this stone, as our jewellers have failed to do so?" Sabbāh rather pertly said: "Why not, Sire?" The Rājah took umbrage at this retort and said: "I had taken thee to be a wise being, but methinks I was mistaken, since thou hast staked a claim which none can fulfil." Sabbāh thereupon said: "It is not your wisdom, O King, that has erred. If you wish to test the veracity of my claim, please be good enough to collect all the jewellers you know." The Rājah did as requested. Sabbāh sent for a sheet which he spread on the floor, and asked four jewellers to hold each of its corners, and raise it. Then he threw the ruby upwards in the direction of the sheet with all his might. It fell upon the sheet. Turning towards the Rājah, Sabbāh said: "The price of the ring is such that you should have the distance between myself and the destination of the ring filled with gold." Those present applauded Sabbāh's answer which commanded respect among the people and the Rājah. The Rājah commanded that the mouth of Sabbāh be stuffed with the best jewels, rewarded him, and fulfilled his commission.

Salāmī has quoted upon the authority of Lahhām that Abū Bishr al-Sīrāfī was at the house of his maternal uncle in Serāndīb. He sent for a red ruby stone and read a book in the light emitted by the stone. The narrator has expressed his surprise since he had thought that this would be impossible, as one could not see at night through the light radiated by

the stone without any external agency. This stone was like a plane semi-square, and its light must have been shed upon the word inscribed upon the book. A lens can also release light so that small words are visible (at night), as the words appear magnified and the space between lines greater. As a matter of fact, this is the measure adopted by the maker of the lens.

There is another story like the one of the *Ismā'īlī* ring. Amīr Yamīn al-Dawlah went on a hunting expedition in the reserve in Balkh. While he was on his way, a beggar from Bukhārā began to importune him. The Amīr usually became irritated by such people and he, therefore, ordered the beggar to be flogged. The centre-piece of the ring which he wore fell off while he gave the command through the movement of his hand. The Bukhārā beggar was watching it. When the retinue of the Amir moved on the beggar took the gemstone. The Amīr on his return journey found the gemstone of the ring missing. He ordered a search for it to be made. Next day, while returning from the hunt, he found the Bukharān beggar at the same place. The beggar, as was his wont, began to pester the Amīr, who ordered that his head be pricked with needles. The Bukharān at this said: "If you do not wish to give me anything from your possession, at least you should take from me what is yours." He then produced the gemstone and gave it to the Amīr. The Amīr, surprised, asked him how he had got hold of the gemstone. The beggar narrated the incident. The Amīr said: "God willed that I should be disgraced by thee", and commanded that 300 *dīnārs* be paid to him. The Amīr told the beggar: "Take this money and do not dare to thank me, for this is a gift from God, not from me. If this were my gift, it would not have reached thee."

A still stranger story is that of Ahmad bin Hasan al-Yazīdī, a drunkard of Farawah. He guzzled liquor all the time. Once as he tippled wine in the meadow of Jurjāniyah, Khwārizm, the stone of his ring fell off. He did not know about the missing stone till the next day. Al-Yazīdī even forgot where he had sat.

Two years elapsed until one night someone knocked at his door, and told him that the missing stone had been sent by the jurist and preacher, Akhshīdī. He found that it was the missing ring-stone. Al-Yazīdī went to Akhshīdī next morning and asked him how he had found the gem. Akhshīdī had two kilns where bricks were being baked. The labourers were bringing bricks for baking and placing them on the ground when one of the bricks fell down and broke. The gemstone came out of it with the name of Al-Yazīdī inscribed upon it.

We will now relate a slightly different story. When Māmūn al-Rashīd returned from Khurāsān to Baghdād, Fadl bin Rabi' presented him with a ruby, the like of which had never been seen till then. Māmūn al-Rashīd

examined it closely, turning it this way and that, and told his companions that he had never seen a more beautiful gem. Then he said:

When Abū Muslim sent Ziyād bin Sālih to China, Salih sent a stone to Abū Muslim which in turn he sent to Abu al-'Abbās Saffah. Saffah gave it to 'Abd Allāh bin Alī. Through him it reached Mahdī and from the latter to Rashīd. One day Rashīd was winding thread round the bow and bending it when the stone fell from his ring. He had the place searched, but the stone could not be found. Rashīd was deeply grieved. The Imām for Prayer, noticing the Caliph's grief, purchased a beautiful stone for 20,000 *ḍīnārs* and had it sent to him but the Caliph would not be pacified. When he saw the gem, he said:

"How can it bear comparison with the gem I have lost?"

Having narrated this story, Māmūn said: "I shall make this insignificant stone useless," and returned the stone to Fadl bin Rabī'. He told the messenger to tell Fadl bin Rabī' that the days of Abū al-'Abbās were over.

When the stone reached Fadl bin Rabī' he was silent and later told his confidant that Māmūn would not live for more than a year. The news reached Māmūn before evening, but he did not disclose the matter to anyone.

When 'Abbās bin Musayyab died, Māmūn attended his funeral. There at the Bāb al-Shām (the Syrian Gate), he was met by a son of Fadl bin Rabī' who began to eulogise the Caliph, and introduced himself as the son of Fadl bin Rabī'. Māmūn asked him to come close. When he had drawn nearer, he whispered in his ear: "Tell Abū al-'Abbās that the time has passed".⁵³

'Umar bin 'Abd al-'Azīz, although extremely pious and eschewing worldly goods – indeed, he was indifferent to worldly and mundane things – yet he kept precious stones well guarded and had many a precious jewel in the Government treasury. He learned that his son, 'Abd Allāh had bought a stone for a thousand *dirhams*. He wrote to him:

I have been informed that thou hast bought a ring, the inset of which has cost a thousand *dirhams*. I command thee to abjure it and sell it. Feed a thousand hungry people with the sale price thou shalt get for it, and get thyself a ring made of silver, with the inset also cast in silver. Have this inscribed upon it: "May God have Mercy upon him who has recognised himself."

'Abd Allāh fulfilled the command of his father. Coming back to the stone lost by al-Rashīd between the gate and the palace, it is quite possible that someone who found it might have made away with it or that it was swallowed by some bird or snatched by an eagle under the impression that it was a piece of flesh. 'Abd Allāh bin Marwān bin Muhammad

had a red gem, the price of which was a thousand *dīnārs*. It was set in a ring. While returning from Nūbah on foot, he kept on lamenting: "If only I had a steed I could mount in place of this ring." One Ummayyad of the Marwānid branch said:

When we fled (the 'Abbāsides), gems proved to be most useful to us, especially those that fetched small prices of not more than 5 *dīnārs*. We could give such stones to a servant or a boy to fetch food and other necessities. We could not dare to take out precious jewels, as the disclosure of precious jewels in our possession could prove harmful instead of being beneficial to us.

And behold how Yazdgird could not benefit from the jewels which were studded on his belt and instead became the cause of his own death. The owner of the flour mill had demanded four *dirhams* from him but on seeing the gems slew him underneath the mill. This is the reason why you will seldom see a Magian but having four *dirhams* in his possession after having learnt the moral of Yazdgird's slaying.

Nasr writes that Amīr Nūh bin Mansūr Sāmānī had two rings. One of them was known as *khurbūzah*, and had a red ruby the size of a grape inset. The other had a diamond of the same shape inset. It is said that people had never seen larger stones before.

Muslim kings held the Ka'aba in great reverence and, following the practice of 'Abd al-Muttalib, used to send precious objects there. When 'Abd al-Muttalib had the well of Zam Zam dug out (after it had become plugged), two bright swords were discovered. These were placed at the gate of the Ka'aba. Two golden deer with patterns etched on them were also excavated. One was set at the door for decorative purposes, the other inside. The Holy Prophet also did the same thing. He had the Golden Book of the Zoroastrians sent to him by Bādhan the Persian after having embraced Islam in the Yemen, suspended in the Ka'aba. Bādhan had sent the book of the Zoroastrians to the Prophet to convince him that he had abjured the faith of his forbears.

Caliph 'Umar bin Khattāb also followed the *Sunnah* of the Holy Prophet. Two crescents, together with a milking pan and two precious cups made from extremely costly stones, were sent to him after the conquest of Madā'in. They were deposited by him in the Ka'aba. All of them were engraved with precious stones.

Yazīd bin Mu'āwiyah had two crescents which were previously in one of the churches in Damascus, sent to the Ka'aba. These were decorated with the *Kibrīt-i-ahmar*, that is, the *rummānian* ruby. Each crescent was worth a hundred thousand *dīnārs*. Accompanying the crescents were two cups, one made of agate, the other crystalline, and two bottles, made of agate and ruby. 'Abd Allāh bin Zubayr had the gate of the Ka'aba gilded with gold.

'Abd al-Malik bin Marwān had two parasols and two crystal cups installed in the Ka'aba. The middle column was gilded with pure gold. Walīd bin 'Abd al-Malik sent two cups, but authorities have not mentioned what these were made of. Saffāh had a green plate which he had purchased for four thousand *ḍīnārs* sent, while Abū Ja'far Mansūr sent a Pharaonic bottle along with a silver tablet, presented to him by the Byzantine emperor. Mamūn sent the gold and silver idols surrendered by the commander-in-chief of Kabul after he had embraced Islam, together with the ruby which used to be suspended on the front of Ka'aba during the month of Pilgrimage. Mutawwakil sent a golden parasol studded with pearls, rubies and chrysolite. It was suspended each year during Hajj.

Mu'tazz's Qubayha mother had accumulated many kinds of gems and stones, none of which she used for worldly utility or religious charity. She would not help her son when the Turks demanded a sum of 50,000 *ḍīnārs* for slaying Sālih bin Wāsif so that he could be saved from the evil of that man. Mu'tazz begged his mother, but that unfortunate woman replied that she had nothing. When at last Sālih slew Mu'tazz, he had three sacks brought from the subterranean vault of the Caliph's mother. One sack had one *makūk*⁵⁴ worth of emeralds. Stones in such quantities were neither stocked by Mutawakkil nor by any other ruler. The other sack was smaller, weighing about half a *makūk*. Such large stones were not possessed by anyone anywhere. The third sack weighed half a *kaylajah*.⁵⁵ It contained red rubies, the like of which had never been seen before. Sālih was told that the price of the jewels was a million *ḍīnārs*. There were other jewels beside these, the price of which was probably in the vicinity of a million *ḍīnārs*. All of these this woman wasted through her niggardliness and idiocy, which caused the loss of her son as well as led to the disgrace of the Caliphate. She got nothing out of the bargain except disgrace by Sālih. Degraded, robbed of all her wealth, and indigent, and cursing Sālih, she went to perform Hajj.

Details about some jewels are not known. It is said that a governor of Khurāsān secured a date tree belonging to a Sāsānid emperor. It was made of gold, with precious jewels hanging like dates from its trunk. He despatched the tree to Mus'ab bin Zubayr. Its price was calculated at two million *ḍīnārs*. Mus'ab bin Zubayr asked his friends whom they thought to be deserving of its possession. They all said in unison: "You deserve it; please keep it for your son." Mus'ab bin Zubayr said: "No, I shall give it to someone who has been kind to us. Let it be given to 'Abd Allāh bin Abī Farwah." And it was accepted by Abī Farwah.

When the Muslim forces entered Nihāwand, they began to deposit the booty with Sa'ib, since he had been appointed to that responsibility. Harbadh called upon Hudhayfah bin Alīmān, and said to him: "If you

are willing to extend your protection, I shall tell you what I know." Upon the latter's assent, he said: "Nahīrjān had entrusted me with the jewellery belonging to Khusraw, and, if you are willing to guarantee me and those I shall name, protection, I shall, give you the treasure." Upon Hudhayfah's agreement to his request, he brought two sacks which contained nothing else but rubies and pearls. The Muslims were unanimous in their agreement that the jewellery should be handed over to Caliph 'Umar only and no other Muslim should be given any share. Sā'ib accordingly presented both sacks to the Caliph who commanded him to deposit them in the *bayt al-māl* till he could decide what to do with them, and that he should rejoin the army. Sā'ib did as he was commanded. 'Umar pondered on the disposal of the sacks the whole night. Next morning he sent a messenger to call Sā'ib back. The messenger found Sā'ib entering the gates of Kūfah. Both had dismounted from their camels the same morning. The messenger told him that the Caliph had recalled him. Sā'ib returned to Madīnah. When the Caliph saw him he said: "What has happened to me and the son of Umm Sā'ib or to the son of Umm Sā'ib and me. Take both these sacks away. May thy father die.⁵⁶ Take them where from thou hadst brought them. Spend the proceeds from these jewels upon the well-being of Muslims." Sā'ib did as commanded and put the sacks (for sale) in the Mosque of Kufa where 'Amr bin Hurayth bought them for two million dirhams, and then he sold them in Iran for four million dirhams.

In A.H. 92 the slave of Mūsā bin Nusayr, Tāriq, marched into Spain from Al-Maghrib, and, during the war, killed the king of that land. The king who was sitting on a throne had a canopy mounted on wheels, and studded with diverse kinds of jewels. The Greeks call them "the cars of war," while the people of India call them *rathis*.⁵⁷ The rooks in the game of chess are also similar.

The Berbers brought from Spain bales of cloth and jewellery, the cloth being silken. The Berbers, unaware of the value of these goods, used to sell them to the Arabs for nominal value. After Tāriq, Mūsā bin Nusayr in A.H. 93 made his entry into Spain, where he was met by his slave Tariq. Their combined armies invaded Toledo and captured it. There they acquired a table which was known as The Table of Sulayman bin Dā'ūd as is usual with the people to associate everything that is strange to the Prophet Solomon as he held sway over powerful djinns, who were very skilled divers and craftsmen. Studded with jewels, this table was made of gold and silver, and it had three wheels. It was dragged by mules. One of its legs was taken off, and an iron leg substituted in its place by Tāriq (ibn Ziyād) as he was suspicious of the motives of Mūsā. He kept the real leg in a secret place. Tāriq found in the house of a vanquished city twenty-four regal crowns, whose price was inestimable.

It would seem that the people (of that city) followed the custom of preserving the diadems of their rulers so that they could record the number and dates of the kings who ruled over them. Alternatively, it might have become a usage.

In A.H. 96 Mūsā presented himself to Walīd bin 'Abd al-Malik and offered the table to the Ummayyad Caliph. Tāriq, on the occasion, said the table was acquired by him but that he had, in deference to Mūsā, left it for him. When Walīd doubted his statement, Tāriq requested him to ask Mūsā about the lost leg of the table and to describe it. Mūsā said he had found the table as it was, whereupon Tāriq produced the leg. Walīd was convinced and rewarded Tāriq, while he reprimanded Mūsā.

Khālīd bin Barmak besieged the fortress in the mountains of Tabaristan where two commanders of al-Jabal and Musmughān had entrenched themselves. Wearied by the siege, both offered to surrender and to swear allegiance to the Caliph. Both came out, and Khālīd appointed a sentry at the gate so that no booty should be taken out of the fortress.

Someone inside the fortress killed a cat and stuffed its stomach with jewels. Having sewn it, he threw it out of the fortress without anyone having known what had transpired. A soldier accidentally passed the place where the dead cat was lying. He brought it to Khalid who, on seeing this subterfuge strengthened the guard. The Sāsānid kings of Persia, fleeing from 'Irāq towards Marw, left their jewels and lighter objects as trust (with the people they relied upon). In the end Khālīd discovered here a treasure whose value was beyond computation.

In the land of Dāwur there was an idol called Zūn made of gold. Both its eyes were of rubies. 'Abd al-Rahmān bin Samurah prised out its eyes and cut off one of its hands. Then he told the priest: "Take the gold and jewels. I have done this to show that this idol cannot be of any benefit to thee or of any harm to thy enemy."

It is said that a person presented himself before the 'Abbāsīd Caliph, Mansūr, and told him: "I entered the graveyard of such and such Chosroe, and saw upon his head a diadem studded with priceless pearls and stones. But I did not like to take them off without permission." Having heard this, Mansūr commanded that this person should be punished with seventy stripes so that it may serve as an example for others, for he had dared enter the tomb of a king, dead or alive.

This is what decency and courtesy demanded. But those who have knowledge of history, are aware of the treatment of the Īrānians by the Arabs after the former's subjugation and loss of suzerainty, and also know of the vengeful nature of the 'Abbāsīdes – 'Abd Allāh bin 'Alī in revenge even had the graves of Ummayyad Caliphs dug out and the avarice of Mansūr would dismiss this as a mere tale, even though it contains a moral lesson about decency and fairness.

Persian narrations are filled with hyperboles and exaggeration. This is also because it is their tendency to emphasise the past glory of their civilisation and the rich traditions of their kings – the Kīsrās. It is said that the ruler of Serāndīb sent to Anushirwān as present seven expert divers, ten elephants and two hundred thousand (years old) pieces of teak. It is also related that the Emperor of China sent a horse together with a rider as a gift. Pearls were studded on the horse, row upon row and the eyes of the horse were of rubies. He also sent an azure diadem on his head, holding court. A beautiful maidservant was depicted holding the carpet, and her body was covered with her hair. This carpet had been packed in a trunk made of gold. A rājāh of India had sent aloe-wood worth 1,000 *mannās* weight. If thrown into fire and melted, it served as ink. Other presents were a red ruby cup studded with pearls and ten *mannās* camphor which looked like pistachios but were larger, a floor sheet made from snake skin having designs and lighter than *harīr* cloth, and a maidservant who was seven cubits tall. The Emperor of China had also sent one hundred shields plated with gold, with silver plating over the gold, and two thousand *mannās* of the Tibetan musk.

The real name of Madā'in was Ctesiphon. Here Khusraw Parwīz had his treasure known as the *Bahār-i-Khurram*. I think this city began to be called Madā'in as it was the halting-place of the emperors of Persia. It was, therefore, called the City of Cities. Its treasury had, besides ingots of gold and silver, gold and silver utensils, and eleven sacks, each sack containing 30,000 red rubies. There were, in addition, ten more sacks, each sack having 12,000 emeralds. There were a hundred sacks, with each sack housing one thousand musks, while twelve sacks had camphor.

All these things are possible, and explanations can be advanced in support of their claims. It is quite possible that the utensils were mentioned, but their number and size are not known with precision. The narrator – perhaps did not distinguish between the profuse and the scarce, the expensive and the trite. The hand of criticism is constrained by everything that does not go against the grain of reason, since the borderline of the distinction between hyperbole and the actual vanishes in such cases.

There are several incidents which are mere stories told to delight the hearers. In this context, we can quote the jewellers' statement regarding Khusraw Parwīz who, according to them, had sixteen attributes not shared or possessed by anyone else. We shall digress from our theme if we begin to enumerate these attributes and the discourse will become long.

A story that has gained currency among the Kūhistānians is that the Kūrāwand stone which had the form of an ox and was buried in the ground, was presented to Husayn, the grandfather of Badr bin Has-

nawayah. He used to pour wine into it and drink as much of it as he liked, and the spate of drinking showed no sign of abatement. A Kurd asked him for this stone. He could not refuse, as this Kurd had cut off the head of his enemy. When people began to murmur among themselves and speculate, he clove the stone into two to prise open its secret. He saw two persons squeezing grapes made of gold, and both figurines had their foreheads tied. The Kurd tried to join the two parts, but failed, and the stone lost its peculiar attraction.

Ibn Zakariyyah writes in the *Kitāb al-Khawās* (The Book of Characteristics or Attributes) that there is a temple in Egypt. Two corpses recline on the throne, and an endless supply of olive oil trickles down from underneath the throne. Having indited this, Ibn Zakariyyah prays for mercy.

Among these legends is the story of the burnt treasure. It is said that the treasury of an emperor of Īrān was stuffed with jewellery, perfumes, and oils on the soil of Persia itself. Lightning struck the treasure and because of its odour, animals within a vicinity of 40 *farsangs*⁵⁸ succumbed to its effects. No one dared to inform the emperor, as they knew that when such accidents occurred, he did not spare those connected with the treasury easily. When the fire burnt out on its own to ashes, the ash of the burnt-out treasure was sifted to reveal a flooring of the red ruby variety. The king was pleased beyond all measure, as the price of such a floor exceeded the total price of all his worldly goods. He surpassed all the kings of the world because of this ruby flooring. The king ordered sixteen tablets to be made out of the stones of the floor. Each tablet was to weigh a thousand *mithqāls*. He drank wine in the cups from the wreck.

Such is the state of man. If he displays patience and bears the misfortunes of the world, then all that is high above in the vault of Heaven is less than man. But those who cannot distinguish between right and wrong, generosity and extravagance, what would they know about munificence.

They do not ponder over the Precept of God:

And those who will not witness vanity, but when they pass
near senseless play, pass by with dignity.⁵⁹

This is in order that they may get real pleasure and be able to distinguish between the good and the evil. They would then turn away from evil, and go after the things which God has earmarked for them. And God has said:

The (faithful) slaves of the Beneficent are they who walk
upon the earth modestly, and when the foolish ones address
them answer: Peace.⁶⁰

Another tale worth laughing described in the books concerning Con-

quests, is that Sa'd bin Abī Waqqās wrote to Caliph 'Umar bin al-Khattāb: "In the booty I have been able to get hold of a golden casket with a golden lock on it. I have not yet opened it. A person has already fixed a price for it. What shall I do?" The reply from the Caliph was: "I should think you had better sell it, as it would only be hiding some idiotic contraption of the Persians." The buyer after purchasing the casket discovered a smaller casket, which he opened. It had a small piece of paper on which the following advice was given in words: "leaving the beard long down the chin is far better than growing it thick round the cheeks."

The purchaser expressed the wish to cancel the contract. Sa'd bin Abī Waqqās wrote to Caliph 'Umar, seeking his decision in the matter. The reply he received was: "Ask him whether he would have made such a request if he had caught hold of a treasure far beyond his expectation." The buyer said: "If this were so, why should I have thought of rescinding the contract?" Sa'd then said: "If so, we are also not prepared to cancel our contract." It is about such persons that Ismā'il bin 'Alī has said:

(Like) the sides of the chests which were decorated with variegated patterns. He who fell in love with those patterns thought the chest would contain all kinds of jewels. But only the emergency of air (greeted) the opener after the lock had been prised open.

The Colours of Rubies and Jewels

According to the jewellers, the best ruby after the *yāqūt-i-ahmar* is the *mawrad al-asfar*, which is followed by the *ghubārī* (dusty or dull yellow). It is possible for different colours to concentrate in one stone, since they (the jewellers) had found a stone that was multicoloured. It had the red, yellow, green, and white interspersed. They knew that fire would burn away these colours except the reddish-white. The red colour is like the original, while the remaining colours are accidental, which volatilise upon heating. The crystal becomes pure. Al-Kindī's statement that he had purchased some jewels from India and heated them, till their colours evaporated attests to this.

The Yellow Kind

Of the yellow kind, the best, according to the jewellers, is that which is bright red – approximates to the colour of the pomegranate. This is followed by the *mishmishī* (crimson), *utrūjī* (citron-like), and the *tibūī* (straw-coloured). The colour gradually begins to wane till the white colour is reached. The best variety is that which weighs one *mithqāl* and fetches a price of 100 *dīnārs*. The prices gradually scale down till the value of one *mithqāl* is merely a *dīnār*.

Al-Kindī writes: "All the varieties of *karkahan* are like the red ruby. Some of these varieties are *khulūqī* (aromatic), *Zayfī* (livine), and

fustuqī (seagreen). *Būqalmūn* is that in which these colours glitter. Different colours are exhibited when (the stones) are turned (in different directions). They resemble the *Bubaraqīsh* bird whose feathers shine in different colours in light and shadow.

And further he says: "*Karkahan asfarī* deceives the gazer, as it is entirely like the *asfarī* ruby. The two can be distinguished only in the light and by friction. It contains more moisture." As for Al-Kindī's statement that the light radiated by the gem can be seen only when the gem is rolled or moved, it seems that these are not its natural colours, but illusions.

Būqalmūn and *Būbarāqīsh* can be seen in the pieces of crystals. Different beautiful colours appear upon the surface of the crystal. Such colours are also seen by a person who narrows his eyes a little and his eyebrows cast a shadow between the eye and the sun.

Nasr says: "The best of this kind is bright yellow, glittering and radiating. This is followed by the *khulūqī* which is bright coloured; this is followed by the *gulnārī* which is brighter and more colourful than the *khulūqī*. Of these varieties the *gulnārī* is the best."

The Khaki Kind

Among the stones of this kind the best kind is the *tā'ūsī* followed by the azure-blue and *ābgūnī* (water-coloured) kinds. The best one which is water-coloured is closer to the white kind. Other kinds are *Kuhlī* and *niftī* though they are inclined to be darkish. One *mithqāl* of the *tā'ūsī* fetches ten *dīnārs*, and the price goes on declining till the price of one *dīnār* per one *mithqāl* is arrived at.

Nasr writes: "The *ghubārī* kind has an hierarchy of its own. *Ghubārī* stones are distinguished because of the depth of their colour. The best is the cerulean, followed by the azure, blue, and the dark-brown (*kuhlī*) variety. The best named is deep in colour." Al-Kindī writes:

At times the azure variety appears to be pale. It is heated till the paleness disappears. On further heating the original khaki colour disappears too.

(This statement of Al-Kindī argues for the fact that the pale colour is less lasting than the khaki). I have seen a gem-piece weighing about 40 *mithqāls*. A larger piece is yet to be seen. A white piece of the same weight has also been observed by us.

Our Khwārizmian treasury also contained a piece weighing over 60 *mithqāls*. It had the picture of girl who had drawn up both her legs to her chest and supported her chin upon them, with her fingers inserted between her toes.

Al-Kindī had purchased a pouch containing stones. About it he says: "Apparently it contained the stones of all colours, but upon observation

in light it was found that it contained red, yellowish, and blue rubies.

Karkind and *karkahan* are yellowish, pistachio-coloured, livine, and *Khuluqī*. Some varieties of *jusbiz* are very red and some less red. But the real colours of the gems appear only on heating and rubbing. A friend of mine read to me an Indian book in which it had been said that the lightest kind of the dust-coloured variety is that which is deep red and is roundish. It should appear dark when seen in sunlight.

Sailors have described an incident regarding rubies. Once, while on an excursion, they arrived near a mountain which overhung a bay, having assumed an angular shape. The sea was dashing against the cliff, and the boatmen went to the lower part of the incline. They were rowing by the shore, being afraid of going deep into the sea. They shot their broad arrows at the rubies suspended from the cliff, so that they may knock them down. The pieces that fell into the shallows and the shore were collected, while those that fell into the sea were left. They collected several rubies in this way and sold them to jewellers.

Al-Kindī says: "There is an azure-coloured variety of *aflah*,⁶¹ which looks exactly like turquoise. People are liable to be deceived and buy it, thinking it to be the *aflah* ruby. There is a dark-coloured variety of the stone: it is of the most inferior kind." He further says: "All the varieties are obtained from the mines of the hyacinth except *aflah*. It is brought from Mandarūn in Serandip". By Mandarūn as if the port of Mandri Patan is meant by him. If you examine the various kinds of rubies and their colours, you will find them to be different in hierarchical order. The smaller the pieces, the more expensive will they be. They occur plentifully like the mineral stones.

We have mentioned gold, silver, and copper which are mined from the same place. Their prices are dependent upon their use.

We have mentioned the different weights of rubies, even though they may be having the same volume but different colours. These descriptions are based upon my personal experiment and assaying. Accordingly, I found the *ghubārī* ruby heavier than the red, apparently leading one to believe that red ruby is inferior to it. The reason probably was that the red ruby had no perforation and, because of its small size, water could not enter it. It was, therefore, devoid of water and became aerated upon the pattern of the lungs. The small hole in the *ghubārī* did not allow the air to enter and discharge the water. If the hole is so big as to admit both air and water, it is the water which is discharged.

Our experiment was based upon water. I have written a monograph upon the subject which further elaborates these points. This experiment has proved that, if the *ghubārī* kind weighs 100, the red ruby of the same magnitude would be $97/8$. In order to avoid fractions, let it be said that the ratio to the weight of the red kind would be 770, while that of the

ghubārī kind would be 800. We have not performed experiments upon other colours. I should believe that the white, green, and red would also be like the *ghubārī* kind, as they are also solid like it, heavy, unperforated, and like the *ahmar* kind without any perforation.

We have standardised 100 of the *ghubārī* kind as the weighing measure for all other jewels. We shall always adopt this as the absolute measure. Al-Kindī says: Of all the jewels the ruby is the heaviest. If we take a piece of ruby and compare it with the equivalent of any other jewel, we shall find ruby to be heavier. Every body occupies room according to its magnitude, and this occupancy is apparent, not physical. Nor on the basis of its size and measurement does any object obtain any colour. Even if the jewels did not melt, people would have cared for them. Neither is their price dependent upon their gravity. Lead, mercury, and gold are heavier than these stones, and they are melted by fire.

The Green Variety (Al-Akhḍar)

According to the jewellers, among the *akhḍar* varieties of rubies, the best is the olivine variety, followed by the pistachio-like kind. These colours gradually fade to white. The green gem does not fetch a higher price than the khaki kind. Abū al ‘Abbās al ‘Ummānī says that a kind of the *ghubārī* is *awḡlah* variety. It is the most colourless, inferior, and soft kind. I believe that the kind designated by Al-Kindī as the *aḡlah* with *h* has been mentioned as *aḡlaj* with *j* by Nasr. This seems to be more correct as the word, *aḡlaj*, is the Arabicised version of *awḡlah*.

Rāzī brothers say that the stone brought by Yamīn al-Dawlah from the temple of Nāhūrālī was *awḡlah*. It weighed more than 35 *mithqāls*. It was mined in India. Compared to the ruby, the *awḡlah* holds the same position that *beryl* and *jamast*⁶² occupy vis-a-vis ruby. This stone was set in 95 *mithqāls* of gold. The king had the gold melted so that he could pride himself upon his achievement among his contemporary rulers because of the gold and jewels. In the *Kitāb al-Fath* (The Book of Conquest or Triumph) we find a khaki jacinth mentioned. I saw the jewel while the Sultān was returning. It reflected slight greenness like that of a mirror. If taken in the hand, it would occupy both fists to the full. It had a perforation upon one side which had a gold circlet, and close to it was written the name (of the jewel) and something else. It seemed light when I felt it in my hands. The Sultān's man seeing this took it from me, lest I might see something in it contrary to what the commonalty believed.

The White and Dark Kind

According to jewellers, the *niftī* (bituminous) and the *kahlī* kinds are the dark varieties or both are *ghubārī*, with discoloration predominating

layer upon layer.

There is a kind of *abiyad* variety which is totally white. Another is that in which some other colour appears and which assumes the white colour on abrasion. Sometimes jewellers introduce different colours into the white kind having bored a hole into it. Put into the mouth, it feels heavy and cold.

Nasr writes: "There are two kinds of *abiyad* variety: (i) the one that is beryl-like, which in whiteness, clarity, and sheen is like the beryl; and (ii) the other kind, which does not have the characteristics of the former, is harder, and is, therefore, denoted by the masculine gender."

The people of India describe a stone known as the *hajar al-qamar* (the moonstone). They call it *chandr kānd* (*chandrakānt*); the word means the rays of the moon. This is not the stone mentioned by Yahyā Nahwī in his refutation of Brucolis, saying that the whiteness shines from its surface, and this spot increases in size as the moon becomes larger until it becomes full. When the moon wanes, it also gets smaller, and when the moon comes out, it grows larger. The people of India believe that, if placed in the *sumrah*⁶³ fruit, water begins to drop from it. I believed this stone to be the beryl on relying *Akhbār-al-Sind* (History of Sind) wherein it is mentioned that the King of that country presented Alexander a cup together with other gifts. They thought this cup got filled up with water by itself. I had thought that it might have been the self-same beryl. This could have been possible and some explanation can be advanced with regard to it. But it is not beyond belief that this could have been the moonstone which we have already described.

White ruby is heavier than beryl. One of its characteristics is that it is cooling to the mouth. From this it seems that water gathers upon its surface just as the drops of water form upon metallic basins in which ice has been placed in summer, provided they are kept in a dark place. People think on such occasions that the water has trickled out from inside. The humid climate of India is especially conducive to this phenomenon. But the exudation of water is not brought about thereby. If these drops are collected, a little quantity of water can be obtained, and the weight of the basin remains constant; it does not diminish provided it is kept tightly closed.

Susurd in his book, "The Compendium and the Minutae" (*Mujmal wa Mufassal*) describes this stone. He has used its water in therapy, and he has stated that its water is of use in fevers and exorcism of evil spirits.

Among the people the general belief is that ruby is progressively *ghubārī*, white, yellowish, and so on, till it becomes red. The poet Ghadā'irī says:

It often happens that the state of pure ruby returns to red colour at

last, having been formerly yellowish.

When transformed to another state, the ruby becomes more clarified and is generally yellowish, ultimately becoming red. People subscribe to this belief because they have heard from the scholars of physics that the ruby, when it reaches the state of perfection, becomes red, as gold when it is at the maximum of its equable state, is inclined towards a little redness. They also believe that the ruby progressively shifts towards different colours till it finally becomes red and remains red permanently, as this is the state of its perfection; and beyond this there is no other stage. Likewise, they also tend to believe that gold, moving out of the hold of its parents, that is, mercury and sulphur, becomes transformed into different liquids, that is, it passes through tin, brass, lead and silver, and, assuming a specific gravity and colour, stays put in one state, since after the state of perfection is attained, there is no further limit. They also think that its weight in earth gets heavier and heavier and it does not assume any other state. But students of physics draw an analogy between gold and man. Man, as compared to gold, is at his utmost limits of perfection and this perfection he has acquired because of his temperament and the essence of his own nature. It is not that he has progressed from having been other animals. That is to say, it is not that he has been a dog, a bear, a monkey, and finally man.

Poet Abū Bakr Ali bin Husayn Quhistānī says:

The rubies, as I have heard, (are formed) by prolonged action of the sun (light) on (some particular type of) stone.

The poet is entitled to his own personal opinion if he believes that through the prolonged effect of the sun every stone becomes converted to the ruby. But in actuality this is not so. But, if he, on the other hand, means to say that stone that has the capacity of becoming transformed into the ruby does become a ruby, he is right. And we have already stated this before. Mansūr Mawrid says:

The dust of her abode is gold and is like the clod of clay that becomes the ruby.

A thing, through the passage of time, keeps on getting converted into some other thing. But the poet's vision that clay becomes transformed into ruby is an expression of his exaggeration. When poets heap encomia, they resort to this exaggeration and hyperbole.

The Badakhshānian Ruby

There are, in fact, three major jewels: ruby, emerald and pearl. Logic demanded that we should have discussed, after the ruby, the emerald and the pearl, in that order. But, since after the description of the ruby, the narration of ruby-like stones cropped up, we thought it necessary to describe the cornelian since it is the major stone most allied to the ruby.

The cornelian is a clear and transparent red stone which, in colour, is like the ruby and, at times, surpasses it in beauty and glitter, although it is less than the ruby in hardness. Its edges and the words (inscribed upon it) are affected by friction rather facily, and this adverse effect gradually asserts itself upon its surface and its glitter. Glitter in the stone is brought about by golden marcasite. Mineralogists call golden marcasite, *turunjah*, since its paleness is like that of the citron. Marcasite comprises several varieties: golden-yellow, silvery-white, brassy-red, and pyrite-black. The polishers use the golden-yellow kind.

I have not yet been able to ascertain whether this golden kind is in use because of some special characteristic. While the other kinds are scarce, therefore, the golden kind is more often used for polishing purposes. Al-Kindī and Nasr call the ruby *bījādhi dhalibī*. I do not know why it should be associated with gold. All that one can say is that the word, *dhalibī*, is associated with the stone, because for polishing purposes it is dependent upon golden marcasite. But even then I should think that the word, *dhalibī*, is beyond probability, since gold and this stone have nothing common with each other as regards colour to recall any likeness or relationship as is the case with some lapis lazuli pieces.

Nasr says: Its mine is (said to be) in Badakhshān. But this is not so. It is associated with Badakhshān as this place constitutes its market. Traders pass through it and here the stone is polished and made smooth. It is as if Badakhshān is the gate through which it goes to the other cities, just as Kābul is associated with the names of the embelic myrobalans, aloewood, and the *biring* myrobalan. In the past it was the closest frontier in the Muslim world to India. Kābul was the capital of the rulers entitled *Shāhiya* — the Turks and then the Brahmans. Kābul thus became like a port where people unload their goods, although pure aloewood is brought to us from the coasts of southern India. Embelic myrobalan is brought from Jalhandar.⁶⁴ At even speed there is a journey of more than two months between these two places. *Biring* is brought from the environs of Qayrat which is situated near the borders of Kashmīr and Gandhāra.

It is known to all that no other kind of ruby, except the red kind is stable when heated, and that its yellow and *ghubārī* colours change in the process. But a person who performs polishing and rubbing has informed me that ruby is stable if heated gradually and also if the stone is left in the furnace and allowed to cool. Fire makes it clearer and more transparent. I have neither observed nor experimented upon it.

Ruby mines are situated near the village of Warzqanj which is situated in the direction of Kharūkhan while going from Badakhshān at three days' journey. It is a part of an emperor's domain, the capital of which is Shakāsīm, which is close to the mines producing this stone. The

approach to the mines via this route is easier, and it passes between Shakkāsīm and Shaknān. This is why the governor of Wakhān keeps the more precious jewels for himself, and precious jewels pass this way clandestinely. Jewels weighing beyond a certain size are prohibited from being carried outside the mine, and only stones weighing up to the sizes he has fixed or specified are permitted to be taken out.

It is said that the mine was located when there was an earthquake in the area and the mountain was cloven. Big rocks fell down and everything was destroyed. Rubies were disgorged in the process. Women thought the stone was something with which clothes could be dyed. They ground the stones, but no colour came out. Women showed the rubies to men and the matter was publicised. The king ordered the miners to locate the mine. When they found it they began to excavate it.

The mines and whatever could be found therein began to be associated with kings and their names, e.g., *Bu al-'Abbāsī*, *Sulaymānī*, and *Rahmānī*. Sometimes the mines are associated with the neighbouring villages and places, e.g. *Nayāzki* which is derived from the peak of a mountain, *Nayāzak*. This name bears no relationship to spear.

The ruby is mined in two ways. Either the mountainous mines are excavated, or the soil or the particles coming out from the mountains is sifted and searched for rubies. Sometimes the soil released by fissures in the mountains is thrown here and there, and at others it is brought towards the valley by the flow of water. Search for rubies according to this procedure is called *tātrī* in the idiom of that area.

The acquiring of something from the mines is like gambling, or like wandering in a wood aimlessly or like navigating the ocean without a guide or sense of direction, since the search for the goal here depends upon one's instinct. The same thing is true for the miners, who begin to excavate and eat the mountain like the termite. Usually, nothing happens. If the excavation is prolonged and nothing comes out, they return frustrated as losers. If they succeed in locating a white stone, which is marmoreal, fragile, has the flint-stone or some other stone around it, they call it on the analogy of fleshy glands – *ghudūd* (this stone is khaki-coloured but inclined towards whiteness) and continue with the excavation, as the location of such a stone symbolises the realisation of hope and continuance of action. Continuous excavation leads them to a stone called *sharistah* which is a very fragile stone and which crumbles as soon as it is taken out. Though useless, it signals approach to success. Finally, digging takes the miners to a stone which is compact and non-brittle and which can be threaded so as to make beads for the collars of animals. *Karkind* presages the presence of ruby. This stone also signals the location of what is sought, that is, it is characterised by turbidity, solidity, and translucence. Excavation beyond this stone leads to the jewels.

Miners say by way of similitude that a jewel is like a king whose fame for generosity spreads to different countries and is the repository of the hopes of mankind in that people traverse barren tracts into quest, where even the guides give up all hope. The example of an excavated mountain is like that of men entering a populated city having trudged all the way through arid, deserted tracts. They are pleased when they reach a populated place. Similarly, the sight of the white stone (*hajar abyad*) is pleasing to the miners, as it is the bearer of good tidings. When the searcher advances from one populated place to another, he is like the miner who has finally reached through *sharistah*, the non-fragile stone. The petitioner, the asker, the searcher has reached the fortress of the country he had sought.

The ruby is found encapsulated in a receptacle, that is to say, the receptacle is a kind of sheath which is like beryl. This sheath or receptacle and what is enclosed within it is known as the *maghal*. These receptacles range in size from that of a nut to a melon. Miners say they have not encountered receptacles weighing more than three *ratls*.

The stone comes out when the sheath is taken off. Usually, there is only one stone and rarely does it happen that there are many stones, big and small joined to each other like the grains of the pomegranate. Some *maghals* consist of one cluster of several pieces of uniform size; these are the size of grains. Sometimes the stones are sheathless as well, and their colours vary from each other according to the mine. In some mines they are white, in others red, and in still others pure red, as in the Abū al-'Abbās mine. The rubies mined from this are very red in colour. The stones of *Rahmānīan* mine are the most inferior. The best stones are yielded by the *Nayāzkī* mine. They are transparent like the *bahraman 'usfur* variety. At present the price of a stone equivalent in weight to one *dirham* is ten Harawī *dīnārs*. If a piece weighs from 20 to 100 *dirhams*, each *dirham* will fetch 20 – 30 *dīnārs*.

Jewellers to Yamīn al-Dawlah⁶⁵ have claimed they have seen a *maghal* weighing more than 100 *dirhams*. This statement corresponds to the statement ascribed to a jeweller who obtained a *maghal* weighing a *mannā* and a half. When the sheath was stripped off, a superior quality *nayāzkī* piece revealed itself. Afraid lest the stone be taken away from him he cut the stone into pieces, and presented a piece to Yamīn al-Dawlah. The weight of the piece was more than 90 *dirhams*. This is the reason why it is often said that the price of a *maghal* is that the finder of the stone can spend the rest of his life opulently.

I used to hear in earlier times that the ruby is sometimes found within its sheath in a liquid state. It petrifies on being aerated. I heard a similar report from a person who had stayed in the vicinities (of ruby mines) for several years but well informed people have denied this. Their

denial, however, does not argue to its impossibility, as this may happen occasionally and these people may neither have heard about it nor seen it, as it has been established about the beryl that it is liquid to begin with and later petrifies.

The colour of this ruby is violet, *ghubārī*, green, and yellow. I have personally witnessed a colour that was not very green but was greenish like the tinge of glass.

A jewel polisher once told me that a noble of this region had a green ruby heated many a time in his presence. Its colour did not undergo any alteration, and it was not affected, even to the extent that emerald is affected by fire.

The green kind is often located if searched among gravel and clay. The yellow stone cannot withstand fire, as its colour alters.

This phenomenon is in keeping with Al-Kindī's statement according to which the colour of the *ghubārī* ruby changed on heating, and, if there was an admixture of yellow colour, the latter vapourised on heating. Besides, the *ghubārī* kind does not possess the shine and sheen of the *usfurī* ruby so that it may be counted among ruby-like stones nor does it possess pale brightness. It is the softest of the different varieties of the ruby and is brittle.

The yellow variety is securable in all mines. Usually, it occurs at the foot of the hill near water in the proximity of the village of Zafranj. This mineral is known as *nāwmaṭūn*. Its stone is apricot-coloured. The violet kind, which is inclined towards the *ghubārī* hue, is found around the Bū al-'Abbāsi mine. Above this mine is another known as the Sharīfī. The jewel obtained from this mine is red with shades of black, which mask its transparency and redness, unless viewed in sunlight. At the back of this mountain where these mines occur is found a kind of beryl which resembles cane sugar. Once I was brought the *ghubārī* variety of this stone. It looked like the collyrium-hued ruby. There are frequent reports about this stone which is partially red and partially yellow. A jeweller has stated that it is quite possible that there may be a segment of the jewel that has the admixture of reddish, yellowish and greenish hues. (Possibly) these colours are not due to the entry of anything particular but to the union of matter and the mixture of colours which in themselves are one.

Nasr bin Hasan bin Fīrūzān was very fond of collecting strange objects, especially gravel and stones. He stated:

I had a ruby which was broad, the size of the palm. Khwārazm Shāh wished to see it and I presented it to him. It was as thick as the finger and broad like the palm of the hand. In shape it was like citron and a pressed grape. Its surface was planer and had the colour of wine but not fully transparent.

The same person (Nasr bin al-Hasan) also stated that he saw a jewel studded on a stone. He commanded his people to rub it with emery so that it may be detached from the stone, but, when it was rubbed with emery, it was found to be unstable, upon which he opined it was an imitation and not a real jewel.

Once I saw a strange object in a cave. This cave was situated upon a stony ground in Qasyā near the village of Salyāhattah in the mountains of Kashmīr. I saw a red semisphere the size of a large pomegranate. I thought this was something similar to what had been seen by Nasr bin al-Hasan bin Fīrūzān. I went closer and touched it. My tactile sensation showed it to be a semispherical clod of earth from which red pomegranate-like seeds had sprouted. Each grain had an oblong and slender stone, and each was as long as two to three grains of a large pomegranate. A thread ran from the root of each grain to the earth, as we see in the pomegranate grains in which a thread runs from the grains to the pulp. I sowed a stone of the grain, but it did not sprout. I wondered how grains could grow in the earth without having any association with a plant or tree.

The weight of ruby and *ghubārī* ruby of equivalent volume is in the proportion of $70\frac{11}{24}$ to 100. Poets invent novel expressions for bibliomancy, benediction, and reading evil omens. The learned⁶⁶ Abū Sā'id bin Dūst Nīshāpurī, having written an epistle in prose, wrote the following two verses:

Undoubtedly the ring sent by you as a gift is a seal of our mutual affection.

I would not have accepted this present but for its being a good omen.

Bījādhī

We now propose to describe *bījādhī* as it is one of hyacinth-like stones and also because Al-Kindī and Nasr hold the ruby variety of it comparable to gold. *Bījādhī* with its rubicundity has a glitter of violet. The best *bījādhī* is from Serāndīb and is red, flame-coloured and transparent. The harder, larger and more tolerant to the uprooted fibres it is, the finer it will be. At times one *dirham* worth of its weight fetches the price of one *dīnār*.

Al-Kindī writes: "It first disclosed itself in the mountain of Rāhūn, and later it was mined from a site between Wakhān and Shakhnān, which is situated in Badkshān in the environ of Takharīstān". But (the stone mentioned by Al-Kindī) is the ruby. Miners who work there do not even mention *bījādhī* nor do they acknowledge any relationship between two. A man going towards Shakhnān from Badakhshān will encounter mountains to his right where ruby mines are situated. *Bījādhī* is known as

sahrī there. Within the borders of Wakkhān is a village known as Sahr to which it is related. The *bījādhī* extracted from the mines of Shakknāyah comes out of the proximity of the mountains on which the town of Hablik is situated. It takes two days to traverse the distance between Shakknān and Hablik. It takes seven days to reach Kadkad which is the capital of the king of Balwal, and is in the direction of the plains of Kashmīr and to the north of Urdistān.

Al-Kindī says *bījādhī* is found in ruby mines. A jewel cutter and polisher testifies to this statement of Al-Kindī, who states that *bījādhī* augurs the discovery of ruby just as *sharistah* prefaces the discovery of cornelian. The occurrence of *bījādhī* might establish the presence of ruby, although it is not necessary that this may be so.

An 'Alawid of this area has claimed that he recovered the Rummāni-an ruby from *bījādhī* pieces. They were very small and each piece weighed one *dāniq*.

I saw a segment of *bījādhī* in the treasury of Yamin al-Dawlah. It was found among the jewels brought from the temples of Nāhūrah. It was like a gravel that is made smooth by the impact of water. But it was oblong and planer. Inclined towards redness, it was very transparent. Its weight must have been between twenty and twenty-three *dirhams*. I never held it in my hand to examine it closely.

I have not examined the comparative weights of *bījādhī* and *ghubārī* rubies. Perhaps they have the same proportion that we have mentioned in the case of ruby. Poet Sanawbarī says:

Wine drips during the Khurdād⁶⁷ as if it is the dripping of the blood of the immolated. Wine in the jewelled chalice presents the sight of the water in which the *bījādhī* stone has been melted.

Mansūr Qādi Harawī says:

Others view a moon in the year that makes the whole year pleasant to them, but such is not my destiny. Thine eyelids have drawn my heart. Even the *bījādhī* stone cannot draw so much grass.

The following verses are also by him:

When thou watchest the moon, it sinks and when it rises again, it is overcome by eclipse.

Even the *bījādhī* stone cannot draw grass to itself as thy eyes have drawn my heart away.

So are his verses given below:

When thou didst see the fourteenth-day moon, it became permeated with eclipse.

Bījādhī cannot draw a blade of grass towards it in the way thy eyes have forced me towards thee.

We will not mention stories that are unworthy of mention. In Al-Kindī's book, *Kharjūn* has also been described among stones similar to it. It re-

sembles one of the stones which is known as *ispīd chashmah*. It is a little smoky and cloudy.

Hamzah has mentioned *ispīd chashmah* among jewels, and he says it is like *bījādhī*, one of the semi-precious stones. Nasr bin Ahmad bin Khatībī says:

It is a stone which is imported from the west into Egypt. Inferior to the ruby more transparent than *bījādhī*, it is more transparent than the Badakhshānian ruby. It is called *ispīd chashmah* and is known by the name of *gharwī*. One *mithqāl* of the stone fetches 30 Maghribī *dīnārs*.

Nasr states:

I have only seen the perforated beads of this stone weighing half a *mithqāl*.

Abū al-Qasim bin Sālih Kirmanī writes:

It is like a coral bead but transparent, although there is a little smokiness in it. The Shī'ites of Īrān use it as a seal, for the reason that it is imported there from the Maghrib where the (Fatimid) rulers of Egypt made their appearance before their advent into Egypt.

He also writes that it is not very expensive, as none but the Shī'ites have any inclination towards it. About *ispīd chashmah* Nasr writes:

It is a species of *bījādhī*. Having the pallor of the Roman agate, its colour is very pleasing. It looks all the more pleasing when studded on the ring.

Al-Kindī writes about it as follows:

It is deep red without having any trace of the violet tinge: Very humid, one of its kinds is very transparent and resembles Roman agate but as regards colour it lags behind *kharjūn*, and is known as *zardūl*. There is still another kind which is yellowish solid, and without any glitter. It is known as *tārbān*.

He further says:

The method adopted for polishing and rubbing emerald is applied to all of its kinds. A perforation is made beneath it so that it might brighten the object on which it is set, since it does not give brightness without being perforated. If very transparent like the ruby and humid, it begins to glitter provided the object on which it is studded is smooth, not rough. However, this happens but rarely.

And he further says that the Khurāsānian *bījādhī* has rarely the weight of one *ratl*, that is, more than one hundred and twenty *dirhams*.

The Serāndībī kind has a weight equivalent to that of the ruby. There is not much difference between the two. Al-Kindī and Nasr mention another jewel which they have called *mādhīnāj*. This stone was brought from above (beyond) the land of Daibal in a mountain within the borders of Sindān; the mine has been exhausted, and production has

come to a standstill. Both have said the stone is very red, and like *kar-kind* except that it is slightly blackish. It does not glisten without any backing and because of its looseness and possession of less material, fetches less value than *bījādhī*; in fact, at times it fetches only one-fourth to one-fifth the price of that stone. Traders say the price of a segment of it was up to one *ratl*. Either it is the namesake of a flower or it has been compared to a flower by way of similitude. Sanawbarī says [in his verse]:

‘Towards lapis lazuli and turquoise and towards *mādhīnāj* and red lead’.

The description of cinnabar (*isrinj*) testifies to its colour, as in the case of the *ghubārī* ruby and cornelian. *Usrinj* (*Isrinj*) is that calcined lead which has been heated to redness with sulphur-like vermillion.

In addition to other stones, Hamzah has mentioned a stone, *manak*. He writes: “It was in the possession of the rulers of ‘Ajam (Iran) and colourless. The padding put underneath it showed its colour.” *Mahā* and white ruby also share this characteristic and the people of India do the same thing to beryl. I saw what had been done to the pillars of Somnath. Two cubits broad and a span high, these constructions merge into each other. Rising up, they form the shape of a pillar. The crown of the pillar has semi-circles of *mahā* studded into the pillar. Shellac is spotted here and there, presenting a scene redolent of redness.

Hamzah has also mentioned *mādhahsūrī*. It is the Arabicised version of *māsūrī* that could point to its characteristics. It is God Who prospers.

DIAMOND

I have given precedence to the description of the diamond over the two other precious stones which have yet to be described, namely, emerald and pearl, since diamond cuts ruby, whilst the latter can cut the other jewels. Diamond is not affected by anything superior to it or by anything that is inferior. But it belongs to this world which is inherently corrupt, and therefore, a thing having a certain weight and quantity does exercise its effect upon it. Its rank among (jewels) is that of a king in relation to his subjects.

The relationship obtaining between diamond and ruby derives through their respective weights and firmness, proximity to each other in mines, upon their capacities to surpass foreign stones, and of perforating and cutting them also.

Besides, the pearl belongs to a thalassic animal, whilst the terrestrial jewels are from cadavers and non-organic deposits. Still the relegation of the description of the pearl to a latter stage does not detract from its nobility, delicacy, and preciousness.

In Hindīya, diamond is *hīrā*. In Greek it is *adhāmis* and *admintūn*.⁶⁸ Al-Kindī says the word means "unbreakable". In Syriac it is called *alamyās* and *kayfād almās*, which means the diamond stone. Its principal characteristic is that it cannot be broken by anything and that it can break everything. Some people are inclined to believe that *zarrān* is the diamond. But this is not so. The word, *zarrān*, is derived from *zar* which means to break off. This is why *zarrān* is called *zarrān*. *Zarrān* is the water of the honed steel or steel itself. The beginning of the *Book of Joshua* in the Old Testament alludes to the *zarrān* in the sword. This would amply demonstrate that the meaning of *zarrān* cannot be diamond. In the verses quoted below *zarrān* has been used with *zā mu'jah* (). Imr' al-Qays says:

Gravel flies off from its hooves. Its ankles are hard and pilose. The sound of the flying gravel is like the tingling of counterfeit *dirhams* in 'Abqar.⁶⁸

Abū al-Hasan al-Sanawbari says:

Its hooves were hurling gravel upon the bridge, while in the clouds lightning was flashing.

Generally, diamond is transparent. It has a little of mercury (in much the same way) as jasmine oil is designated *duhn rasāsī*. Al-Kindī has compared it to the pharaonic glass. It occurs in white, olivine yellow, green, dusty and black colours.

It is examined in the following manner. One of its corners is pressed well into wax. It is then put out in the sun. If first redness and then the colours of the rainbow appear, the specimen would be a fine one. This shine is possessed by the white and yellow kinds. The people of India for this reason esteem these two varieties as the best. It is said that they get blessings from it. If this is true, it is dominant over the other stones of its own genus. Their book was read out to me and it was written therein:

One should blow his breath over the diamond until it gets warmed, then place in a basin of saline water in which silver has been washed. If it appears white, it is of the finer kind. It is then used for the adornment of swords, necklaces and all other jewellery that is used to adorn the upper part of the body. If it appears red, it should be suitable for the jewellery worn in the middle of the body. If exhibiting yellow colour, it is suitable for use in bracelets, rings, armlets, etc. The black kind is suitable for ornaments of the feet.

The people of India also say:

If worn contrariwise to this arrangement and if these colours are employed for the adornment of other instruments and jewels, it will shatter with the impact of lightning.

This statement strikes a strange note. It is true that sound does affect

cavities of the body, e.g., the internal organs of the body, intestines, ears and things having recesses, e.g., domed houses, mountain caves, etc., since the high pitch of sound and its volume collides with them, and affects them adversely. But the diamond is beyond any interference, and does not have any recesses or cavities. Besides, its physical appearance is conical, quadrilateral, and of the type of compound triangles, just as the known forms that have predilection towards a fiery nature, have sides adjoining each other. There is a variety of diamond that is airy. It is then called *shaṭīrī*, since its two sides are sharp, like barley grains, and the middle is slightly prominent.

Some persons are inclined towards the belief that the diamond can cut all the other stones and bore a hole through them as it possesses the characteristics of a fiery species. Its fire penetrates other things from one end to the other; that is, its fire makes a hole through them, and cuts through the distance of its sides.

Considering these aspects, it rises to a position higher than that of the white ruby, but gilders cut the ruby in such a way that it becomes shaped like a diamond, and thus manage to pass it off as diamond.

Some stones were brought to us from the vicinity of Isfānqān or Sārīqānīn in the region of Nasa. They were barley-shaped and as big as barley grains. Among some could be seen the triangular forms of diamonds. They had the yellowishness of *khabīr*.⁷⁰ The observer is liable to suspect that the stone has been abraded to make it spurious, although this is not so. There are two reasons for my belief. I saw cruciform marks upon them, with one line crossing the other, entering into one and coalescing into it. This led me to believe that they were, in reality, soft and moist like flour. This alone enabled one line to enter the other under pressure. The outer reason is that the person who had brought them said that these stones were found by him in a cave having a loamy soil which was reddish white, and these stones were found in the cave in ample quantities. It naturally occurs to one that, when the stones are so plentiful, there is no reason why people should resort to gilding. These stones could be facily ground and were not like hard stones.

Although I have never experimented personally yet I believe that like *saṃgh al-balāt* these stones can be used for the cicatrisation of wounds, since their colour resembles that of the Khwārazmian stone which is employed for that purpose. Spheroids-conical in form, this stone is semi-transparent. On breaking, one conical fragment is distinct from the other, and one conical cavity occurs within the black interior of the stone.

It is said that the habitat of these stones is on a depressed earthen tract which is opposite the village of Sarīghad to the east. It is on the third *manzil* from the borders of Khwārazm towards Marw and Bukhārā.

This depression has three mounds which are like three triangular bricks supporting a hearth. These stones are taken out from there. That the stones assume a specific form should not evoke any surprise since among the mountains in the vicinity of Parshāwar, there is a mountain which has the colour of iron. Its stones and particles are like thick unbaked bricks and somewhat like pieces of iron and of approximately the same weight, although lighter. Stones from near Fort Nandna⁷¹ in the region of Mankāwar in Hind were brought to me. They were both big and small, but measured a span or less. They had a tinge of white and appeared white. They were quite transparent and bore resemblance to *jamast*. All looked like cast amulets having hexalateral shapes, with two conical shapes adjoining the elongated sides. They had smooth surfaces, and anyone who observed them could not suspect that they had not been polished and moulded. I saw that some of the stones had other stones studded on them, these being of another species and non-transparent. If the latter were to be rubbed, they would be on level with the stones on which they were studded, and, if rubbed on sides, the marks of friction would be all too visible. Nor would any evenness be produced. This being so, I judged that this was their natural and not artificial form. Existence of stones of a similar description was reported to me in a well in the mountains near Ghaznah.

The people of India prefer the diamond that is unbroken and whole in shape with its sides sharp. They do not like diamonds with broken sides. In fact, they tend to regard this as an evil portent. Possibly this is so, because such a diamond has been overcome by something else. They hold the same belief about idols. They do not like those that are broken or bear some defect.

The people of 'Irāq and Khurāsān do not distinguish between the different kinds of diamonds or their colours. All diamonds are alike in their eyes, as they use them for drilling and for creating poison. They do not venerate the diamond like the Indians do. The Indians call its white variety *Brahmin* and the yellow one *Khatri*. They do not like the other varieties and call the black varieties *Chandāl*.

Thus they have named the superior varieties after the hierarchical caste system that operates among them.

Abū Zayd Arrajānī has quoted the authority of some physicians that the diamond if given to persons as a drink, kills them after a little while. We do know that this stone possesses the characteristic of killing in the manner of the stone that resembles the coral, and it is described among the mortal poisons. This may be because of its form, firmness (hardness), and gravity. We see that mercury is heavier than it, but if it is alive, it does not kill until and unless some extra property is incorporated into it. The person who has indicated its poisonous nature has ascribed

its fatality to its shape and hardness. He, therefore, says that it bores a hole into the liver and intestines, and this would not take a long time. Also, it cannot be used in its original form, otherwise the person to whom it is given, will become suspicious. It can be administered only after being thoroughly ground in which case it cannot have the capacity to perforate the stomach. Grinding will do away with its hot and acrid attributes. If this is not so, it would be impossible to administer it as a drink to a third person, since it can be administered if mixed with sugar or salt, as in itself it is tasteless. If it has not been ground well, it will be betrayed by the teeth of the eater. A dog was administered the diamond. It was affected neither at the time nor was any effect noted later.

It is all idle talk, without any substance as is the belief about the diamond that it is the congealment of smoke, in the same manner as sal ammoniac results from the congealment of smoke. People compare it to the notch of the arrows receiving the string as they believe it to be a slayer and the product of lightning, just as sal ammoniac is held to be the product of smoke. When people observed in diamond the glitter of the arrow, they began to compare it to arrows.

In order to generate surprise among the commonalty, these people also say that it is the hardest amongst all precious stones and overcomes all the other stones, yet the softest and least compact metal breaks it, that is, the lead that is wax-like. But this amounts to staking a wrong claim. It is for a different reason that this is so. Lead breaks up gold and even the dross from which it is obtained if coated upon (gold). It also pulverises the diamond. The fact is that, when diamond is broken between the hammer and the anvil, it spoils the surfaces of both, and if it breaks, it destroys both. It is, therefore, wrapped in a layer of pieces of lead and given soft strokes. The stroke is effective, and also does not harm the anvil and the hammer, and is also saved from falling and dispersing. Wax is employed in place of lead in *unbūbat qasab* (the reed). When on grinding and pulverisation its pieces get smaller, the jewellers coat them with something that keeps the flies away. Jewellers say that when the fly perches upon diamond grains, they cling to its proboscis with the result that the total weight of the diamond diminishes. This is also observed in the case of barley gruel and pieces of bread loaves when flies sit on them. Their proboscis is like the *miswāk* which draws off the moisture, and whatever it wishes to carry clings to it.

If a soft object is inserted between a hard object and the thing to be penetrated, then the effect to be achieved would be enhanced. If an archer wishes to hit an iron plate and to bore a hole into it, he puts a flat piece of flesh upon the plate. The arrow does not cling to the flesh, although it first penetrates it but its impact is felt upon the plate through it. Similarly, if a thin loaf of bread is tied to a hard object, the knife

would cut through it as it would cut through the radish and carrot. It is, therefore, quite possible that the lead coated round the diamond has the same effect.

It has been said about the diamond that the best kind is crystalline, followed by the red variety. Half a *mithqāl* of it is said to fetch a hundred *dīnārs*. Al-Kindī writes:

The best kind is that which in the sunlight displays the variegated colours of the rainbow. One *mithqāl* of it the size of the grain of a pepper fetches a price of eighty *dīnārs*. I have not seen a stone bigger than the pinenut. The bigger pieces are three to four times costlier than the smaller ones.

Rāzī brothers say:

We have not seen a piece larger than three *dirham* weight.

The stone is measured with the *dirham* as the standard, not *mithqāl* as in the case of the emerald, or Badakhshanian ruby, and the gold obtained from wells in the form of grains and which is not heated. It is said that each *dirham* of the small grains (of the stone) is priced at 100 *dīnārs* and a full segment one thousand *dīnārs*.

Nasr has narrated upon the authority of Mu'izz al-Dawlah Ahmad bin Būwayh that Mu'izz al-Dawlah sent the gift of a diamond jewel weighing three *mithqāls* to his brother, Rukn al-Dawlah. Such a weight had not been heard of in the case of diamonds.

The diamond mine is situated in an island where there are streams. The sand from these streams is taken out and washed, as the lodes of gold are washed. The sand is decanted in a conical vessel. The diamond particles settle down. These mines occur in Khwār which faces Serāndīb.

Abū al 'Abbās 'Ummānī says that its mine is situated in Tankalān Qamrūn within a fiery mountain. Its clay is washed during the year in which lightning flash more frequently. Al-Kindī says: "It is picked up from the stones found in ruby mines." This is quite possible, as ruby and diamond occur in the same place and bear resemblance and close relationship to each other.

Some have said that the diamond occurs in gold mines. If this be correct, it could occur in the mine in the islands of Zābij. These islands are designated the Home of Gold. In Hindīya they are known as *Suvarn-dīp*, that is, the Isles of Gold and also *Suwaran-bharam*, that is, the Golden Earth.

They argue that files are rendered useless by something that occurs with pure gold in the size of a grain of sand and causes sores like those made by diamond. Gold is, therefore, thoroughly melted, so that this foreign presence separates. The melters designate it as *samās*.

This name is also employed for the *turunjah* used in the extraction of gold, which is the golden marcasite. Such a stone is sometimes found to

occur in yellow amber. The one we have mentioned is very hard and spoils the lapidary instruments.

Just see for yourself how careless 'Utārid bin Muhammad has been in his description of the diamond in his book. On one occasion he says that the diamond is not affected by anything. Then, forgetting what he has said, he writes that there was a diamond stone in which was engraved a woman standing upon four horses. There was a mirror in her right hand and hammer in her left, with seven rays radiating from her head.

How we wish the narrator could describe how these engravings were made! Probably he thought these were made with lead, since he had already said lead could affect it.

There are many absurd tales current among the people about the diamond and its mines. Diamond is called the *hajar al-'uqāb* for the reason that those in quest of diamonds put a mirror in the nest of the falcon before its fledglings so that it may see them without reaching them. The falcon then brings a diamond which it places upon the mirror till several diamond pieces accumulate which are then picked up, and the mirror is removed so that the falcon is led to believe that it is because of its stratagem that this has happened. After a certain period has lapsed, they again put a mirror and the falcon again brings diamonds.

It is rather surprising that chemists designate sal ammoniac by the metaphorical name of *'uqāb*. We have already mentioned that these bear resemblance to each other in form.

Al-Kindī has also narrated this legend, substituting, however, the sparrow for the falcon. It is said that if the fledglings of the sparrow are daubed with saffron, they bring out the jaundice stone. Possibly Al-Kindī also doubted the veracity of the story. In the event, all this is idle, absurd and useless talk.

Another legend is as follows: All the diamonds found in the world were collected by Dhū al-Qarnayn. There were snakes in the valley whose appearance killed anyone who gazed at them. Dhū al-Qarnayn devised a mirror held by bearers who hid themselves behind it. The snakes saw their own reflection in the mirror and died. How strange that the snakes used to see each other constantly before but did not die!

If their reflections in the mirror could kill them, why could not their bodies snuff out their existence before? And if this effect was specific to man, how is it that the snakes die on seeing their reflections? Moreover, if Dhū al-Qarnayn could use such a stratagem, why could not his successors repeat it?

Galen has mentioned a snake which he calls the queen of Serpents. He says anyone who sees it or hears its sound, dies on the spot. How I wish I could know the name of the supplier of the information. How could anyone relate this phenomenon if he died on the spot!

Ibn Mandawayh has said that *Bāsilīqūn* is the King of Serpents. Its eponym derives from the possession of a crown upon its head. It is said not to measure more than four spans. It has a sharp head, red eyes, and is yellowish-black in hue. It incinerates every thing it passes by. Animals run from it or else they faint. Any fowl flying over it falls down to the ground and its sight even from a distance is sufficient cause for death. Anyone who hears its rustling sound within arrow-flying distance, dies. An animal which draws near to the one that has been bitten by it dies. This serpent is found in the land of the Turks (*sic.*) and Lūbiyah which separates the west of Sudan from Egypt.

Actios of Amida writes in his book 'which has been translated by Abū al-Khayr in Arabic' that the length of the serpent, *arqam*, which is also called *ibn qutrah* is a cubit and a half. Possessing a slender body it is red-hued. It slays by bite, by being seen or heard. Its victim dies before any medical treatment reaches it or him. If anyone approaches near its victim, at first he loses his hair, turns yellow and finally black. The body putrefies and gives off stench.

All these stories are fables and useless. As for the crown, there are many animals that have been graced with it, e.g., the cock and the peacock.

Among the snakes a horned kind also features. Different tales are told about the horns. Some say the horn is black, crooked, and hard. Some say there are two horns of the kind just mentioned. Others say these are two projections of the flesh.

A poet [Dhū al-Rummah] says in praise of the serpent and its fleetness:

A horned one, called Dhū al-Qarnayn, is very black.

Its sound and the nimbleness of its gait are wonderful.

Abū al-Najm says:

"The horned one imitates it."

Now coming to the yellow colour, a Tabaristānian has mentioned to me an incident. Some people were passing through scrubland when they came across some dead persons. One of them had a little breath left in him. When asked what had happened, he said he could not realise what had happened except that he and his companions saw a yellowish thing more than a span long. They leaped towards it and realised that it was a snake which had glided in front of them. They all fell down upon their faces, upon seeing it.

It is difficult to believe that the sight of an object on the spot would affect the observer. We could perhaps believe it if its image remained imprinted upon the lens of the eye. But we cannot acknowledge that it will burn. The same thing is true of sound. It does not affect the ears and the cavities, or the sheathed organs of the body unless of course the re-

port is excessively loud. It has been said by the narrator that the person who listens to the report at the distance of the flight of an arrow dies would probably imply that the report must have been very loud and deafening.

Coming now to the contention that the person coming into contact with the person who has been bitten by a snake also dies, the following incident has been offered in support of this belief:

Two persons saw a snake shrivelled up by cold between Ghaznah and Fālzakhd. One of them lifted it with his hand. The snake recoiled and bit him in the wrist. He immediately died. The other person who lifted his corpse died too, as did the person who bathed him and the man who bathed the bather after a week.

Ibn Mandawayh narrates the story of a man who (inadvertently) placed a pile of sticks upon the Queen of Serpents. He immediately forfeited his life, as did the rider who aimed a lance at her. He and the horse died. She once bit a mare who died together with the rider.

This story is somewhat like that which we hear about the *raddah* fish. It is said that the power of this fish suffuses the net as well as the log with which it is pressed. But this story holds that, while it can be seen, the spectator does not die because he has seen it. Heraclitus says: "It can be seen. Were it not to be seen, how could anyone describe its characteristic?"

Similar to this farrago of nonsense about the fish we have the story from the Mediterranean.

A headless body was seen in the sea. Everyone who saw it died instantly. The stratagem adopted for its capture was that a diver diving underneath it turned his head the other way, caught it and presented it to the king. The king used this body against the enemy forces who died when they saw it. The enemy retaliated by keeping blind men at the frontal phalanx. They did not die. The king, being afraid that the body had lost its effect, turned his head and looked at it. He died. His courtiers, in order to save people from its malevolent effects, set fire to it and destroyed it.

A similar legend pertains to a stone which paralysed the gazer. Alexander had a city built from these stones at night, so that the masons might not succumb to their evil effects.

Even a stranger legend is that which is ascribed to the epistles of Mūsā bin Nusayr contained in *Kitāb al-Muta'ddibīn* used for teaching children:

It has been mentioned in one of these epistles that Mūsā bin Nusayr reached a castle in the desert of Al-Maghrib. It had a large circumference but had no gate. When his soldiers having found no gate, he commanded that the soldiers should heap their luggage one over the

other, till the heap became even with the rampart. One soldier was at last made to climb over the wall. As soon as the soldier reached the wall, he began to laugh and got down. Mūsā made two more soldiers climb the wall. They too laughed and got down. When this was repeated by the next soldier who had climbed, Mūsā was overawed and turned back.

It is amazing that it struck none of these ignorant ones to pull down the soldier when he started laughing in order to extract the necessary information from him.

Another story is that of diamonds in a cave, which is not accessible to men. Therefore, they throw fresh meat into it; the meat sticks to the diamonds. The many vultures and tercelts who are attracted to the cave on account of the meat thrown into it bring out the piece of flesh from the cave. It is the habit of birds to shake off the bits of earth and other impurities from their food before eating it. People then gather up the diamonds. Hence its name *hajar al-'uqāb*.

There is no limit to such fantastic tales. It has been said about *hajar al-'uqāb* that it is a cure for many diseases, and the falcon collects diamonds in its nest on account of this reason. When it fears for the safety of its offspring and the nest, it throws them down.

The same thing is believed about the beaver. Its hunters catch it only for emasculating it and then leave it free. Its testes are the castoreum. If a hunter wishes to catch it again, the beaver rolls on the ground and displays its testicles so that it may go free. But those who relate these stories should know that it is hunted as much for the sake of its fur, skin, and flesh, as it is caught for its testicles. It is God Who prospers.

EMERY

Its Persian name would show it to possess the power of boring holes. It possesses cutting power like iron, and in scraping and polishing is the adjuvant of the diamond; in fact, at times it functions for the latter. It is for this reason that we have mentioned it after the diamond, for if it did not possess this virtue, it would have had no value, although it is found frequently. Thus it is used in cutting, filing, and polishing stones. The Samarqand sand serves as its substitute. Files are made from the latter. It files away iron and affects it. Al-Kindī writes:

Sambādhaj (emery) is a stone found in the littoral areas of India. It is like the grass that grows in the sea. It can be easily ground. Ruby and all other stones can be rubbed with it, as it is hard and rubs them away gradually.

Al-Kindī, while describing it to be hard, also shows it to be facilely grindable. This is rather inappropriate, as both these characteristics are the

opposites of each other. I fail to appreciate what its relationship with grass can be. It is possible that this mistake has been made by the copyist.

The Rāzī brothers say that the best emery is from Nubia. This is followed by the Serāndībi and Indian varieties, and that the Nubian kind is also called the *zanjī*. It is said that it is found admixed with sand grains in the rivers, and hands feel cold when they touch it. It is in this way that it is separated. Being hard, it is used in the making of jewels. The Serāndībi kind being softer, is employed in sword-making.

The *Kitāb al-Hajar* mentions its mines to be in the islands of the China Sea, and describes it to be rough like sand, some grains petrifying to stones. Some say that the rough kind is the one which the ants take out of holes as they would take out earth in the manner of grains, and which they spread round the stones. Some say that the lentil-like (*adasī*) kind is the best. The aromatic kind (*khuluqī*) known as *samīrus*⁷² is the next best. It is also said that one of its varieties is soft and fibrous. It is loose and humid in the mine and is designated as *kibrīt-i-ahmar*.⁷³ The knowledgeable ones believe *kibrīt-i-ahmar* to be the red ruby variety. I believe that this follows from the fact that emery comprises reddish grains which in redness are like *karkind*. Some transparent crystals are made from brimstone and arsenic. These were brought from Isfahān. When thrown into the fire, they let out blackish sulphurous flames and gave off the odour of sulphur. People then began to see its similarity to the ruby. Some jewellers have also mentioned that they have seen grains of sulphur having the form of pomegranate grains. People in general designate by *kibrīt-i-ahmar*, the elixir through which one could hope to obtain a metal by artificial means, e.g., the conversion of silver into pure gold. People also believe that its mine is found in the mountain of Danbāwand. They seem to have based their knowledge upon hearsay, having heard about some salt from the chemists and the types of salts used by them.

Some Magians believe that Bayūrasp was imprisoned in the mountain from the summit of which smoke belches out. This smoke is the breath of the prisoner, while the sulphurous water which comes out of the slope of the mountain is his urine and also of the women he has raped there. When the water cascades from a certain height and passes through an orifice, an exquisite yellow brimstone deposits round it. Chemists began to use it in place of the special salt and brought red brimstone out of it. This, they regard as the elixir for gold.

I saw a stone with a person who used to undertake sea voyages. The piece was reddish-black and handful in magnitude. Its slender pieces, on breaking, were slightly transparent. When a silver *dirham* was placed upon it, the stone perforated it. The person said the stone was imported

into Basrah from China and it was called *kibrīt-i-ahmar* by the makers of gold foils. I did not learn anything else from him.

Another fantastic phenomenon described in the *Kitāb al-Ahjar* is that the brimstone mine glitters at sunset near the ocean. This glitter can be seen from several *farsangs* and continues till the brimstone is present in it, but, as soon as it is taken out, the glitter disappears.

THE PEARL

Allāh has said:

(In beauty) like the jacynth and the coral stone.⁷⁴

God has mentioned the jacynth (ruby) first; therefore, we have accorded precedence to it as regards description and then turned to ruby-like stones and the stones that are passed off for it together with an account of the kind that is the hardest and superior to the rest of the varieties. Now we come to the description of the stone that has been described in the Quran after the ruby: it is the coral stone.

Each object is known by different names in varieties. It is but rarely that two languages have the same name for one thing. There are different nations in the world and each nation has its own language. As far as languages are concerned, an object may have different names and the tribes have their special characteristics. Even though the language of the tribes may be one, they view the same thing differently. The people of India usually give many names to the same thing, some names being particular to it and others following from its specific characteristics and attributes. Our scope relates to the Arabs and Arabic verses: we are unconcerned here with what is in the Hindiya.

Quite often lexicographers hearing something from every people and tribe, explain and expatiate upon what they have heard. But this is hardly of an advantage to them except to show to people that they know a great deal and that they have a storehouse of words far exceeding that possessed by others. In the process they have forfeited all tenets of honesty and, in order to prove their point, they ascribe verses coined by themselves to the dead, and from the beginning to the end, have followed the dictum:

'Lie to your heart's fill when you feel like it. Do not quote a living poet in support of your contention so that he may belie you. Quote from the dead as they will remain hidden to eternity'.

Lu'lu' is a genus and the generic name is applied to the big pearls and the smaller coral stones. Abū 'Ubaydah says: "The word, *durr*, is applied to the bigger grains and *marjān* to the smaller ones, as Allāh Himself says:

There cometh forth from both of them the pearl and the

coral stone.⁷⁵

These are the two big and small different kinds and *lū'lū* is the larger kind. Abu al-Hasan Liḥyānī writes that the *durr* and the *lū'lū* happen to be large. Abū al-Hasan has not opposed the view that *marjān* signifies the smaller pearl, but he is opposed to the signification of *lū'lū* by *marjān*. Probably he has formed his opinion from the verse by Nābighah:

Her neck has been bedecked with *durr* and jacynth and *lū'lūs* have been threaded between emeralds.

Emeralds are threaded with the pearls and rubies. 'Alī bin Jahm has said something converse to Nābighah:

When she saw the whiteness around my head,

She asked: "Is this old age or threaded pearls?"

Here, the poet has denoted *marjān* by *lū'lū*. Smaller pearls which are the size of the rape-seed on being strung, present the appearance of white hair. And this is the sense which the poet has taken, not old age: for had he taken the sense to have been old age, he would not have mentioned threading, as old age is more like dispersed pearls. Aws bin Hajar says:

As if the rope has broken and the smaller pearls have dispersed.

Ibn Babak says:

The crescent at that time looked like the remainder of the broken thread of pearls.

The poet here means the smaller pearls. When the rope is distant from the eyes, the pearls look uniform and even the hiatus between them is not visible. The broken thread has been mentioned here as the cutting off of the thread resulting in an incomplete circle.

Ahmad bin 'Alī in the *Kitāb Sharah al-'Ilal* (The Book of the Explanations of Causes) says:

Day is called *nahār* as light travels during the day from the east to the west like the flow of a canal (*nahr*) till it spreads from the east to the west.

I really do not understand why this should be so, for, if we accept this explanation, what difference would there be between the day and the night, since it can be said about the night as well that it would travel west to east in the manner of the canal (*nahr*) till it spreads from the west to the east. Ahmad says about *layl* (night):

Night is called *layl* as, when a man looks at an object, he says: *Hūa Hūa* (it is that). When he doubts what he has said, he says: *Lā lā* (No, No). Since it is called *lā lā* with respect to objects, it has been called *layl*.

He further writes about the *lū'lū* that it has been so named, as jewellers say that it presents a different sight each time one gazes on it.

He has quoted the statement of the jewellers to the effect that pearls look good because of their spherical form. Human sight embraces the

whole of the pearl and can envision most of its parts. As a matter of fact, more often, because of its transparency, the sight can travel from one part of it to the other and can thus see both its faces. This is not so with the spherical solids, as the sight can locate only a little of it, and, if it is turned upside-down, the eye sees a new portion which it had not gazed at before. Allāh be the Helper!

Lexicographers and the Names and Characteristics of Pearls

There are several names for the pearl in Arabic, just as there are many names for the lion. I will not discuss all of these, because in the first place I am unable to do so, and, in the second, it would mean an unnecessary stretching of the theme.

Among its celebrated equivalents are: *lū'lū*, *durrah*, *marjānah*, *nutfah*, *tawmah*, *tawā'miyyah*, *latīmiyyah*, *sadafiyyah*, *safānah*, *jumānah*, *wan-niyah*, *hayjmānah*, *kharīdah*, *hawsah*, *tha'th'ah* and *al-khusl*. According to Khalīl bin Ahmad it is called *nutfah*, as in brightness and transparency it is like *nutfah* (drop of water).

Hail and the milk-drop are closer in appearance to the pearl than the drop of water. It would be more appropriate to compare it with a drop of the sperm fluid. But this similarity would be on account of its whiteness, not transparency, although while comparing the semen to the drop of water, it is called *nutfah* and also *mā'i mahīn* (useless water). It includes both men and women as regards connotation, but usually the word *nutfah* is used for semen only.

A poet says about *tawā'miyyah*:

Like a true pearl is she. On union she would cool the eyes and impart warmth to the bed.

The word, *tawā'miyyah*, is associated with a coastal place. If the pronoun of *ba ashārtuhā* is a pronoun of the feminine gender, the meaning would be that the sight of pearls is cooling, and, because of their exquisiteness, there will be no uneasiness if they are spread upon the bed. But if the pronoun is meant to denote the woman with whom the pearl has been compared, the implication would be that her sight is cooling to the eye and union with her would make the bed warm.

Hirmāzī explains the origin of the word, *taw'am* for the pearl by pointing out that this is the name of a village in 'Ummān close to the coast and the mountain situated on the road to Mafāzah, there being a distance of twenty *farsangs* between the two.

The word, *latīmiyyah*, is associated with the word, *latīmah*.⁷⁶ This is what has been said in the exegesis of the verses of Abū Dhū'yab.

Similarly, the word, *sadafiyyah*, is associated with *sadaf*, since the word, *latīmiyyah*, does not appear to be appropriate. Nābighah has used

the word, *sadafiyah* in place of *latīmiyyah*, while comparing woman to the pearl.

She is like the bright pearl whose sight pleases the diver, and whoever sees her is filled with gladness and performs prostrations.

That is to say, people are filled with gladness at the sight of the pearl which was hitherto concealed in a shell. The Qur'ān also uses the word, *lū'lu' maknūn* (pearl concealed in the shell).

The shell (*sadaf*) is like the mother, and a mother is very kind to her offspring, guarding it with meticulous care, but here Nābighah has employed the word, *sadafiyah*, not because the shell acts as a sentinel with respect to its beauty and symmetry but in order to bring out the more associative feature.

Abū 'Alī al-Isfahānī has criticised the use of *sadafiyah* by Nābighah in this verse. He says the use of this word here is superfluous and devoid of any significance, since all pearls manifest themselves out of the mother-of-pearl, and therefore, *sadafiyah* does not bring out any point of significance nor any special effect.

But even this verse can be explained if we keep in view the fantasies from India. The people of India believe that the superior kinds of elephants have pearls set in the middle of their foreheads. These elephants are (according to them) brown in colour and have fragrance like the Indian jasmine. Similarly, they claim that a special kind of bamboo has pearls in its root. It is said by them that this bamboo is reddish, having an excessive quantity of fibres underneath. The fibres are loose, soft and humid. When it rains at the time the moon is in her sixteenth mansion with three stars in Libra, these bamboos ripen fully, and pearls are produced inside them from drops. *Tabāsheer* is made from them.

Would the coastal people see pearls in the bamboos yielding *tabāsheer*, they would not have burnt them without splitting them, and the knowledge that these plants possess pearls would have been publicised.

Even if pearls come out of elephants or bamboos, those of the Sea would be called *sadafī*, and hence Abū 'Alī's censure would be wrong. 'Abd' al-Rahmān bin Hassān says:

It has the brightness of the pearl of the diver. It has been taken out of a concealed jewel.

If the poet means that the pearl has been taken out of the shell, then we must remember that no one calls the shell a jewel, although it guards the pearl. Sulaymān bin Yazīd al-'Adawī says:

As though it is a very white concealed pearl which the shell saves from the buffets of waves.

If 'Abd al-Rahmān wants to show that the pearl has been created from noble matter, then he would be right.

The word *tawā'miyah* would imply pair as distinct from *yatīmah*

and *farīdah* (being unique). Pearls are strung in one thread and they are worn round the wrist in two strings. These strings are called *akrās*, i.e. *tarā'iq*. It is said that the word, *kurrāsah* (a sheet of paper folded so as to form a tract of several leaves) follows from the former. When the pearls are strung around with a pearl in the middle, and face each other, they are no longer incomparable and unique, since there are other pearls present in the string with them and they become arranged one upon the other. This is what is meant by *takārus*. Dhū al-Rummaḥ says:

Dew-drops upon sprays at sunrise look like studded pearls.
The poet has compared the dew that has deposited at sunrise with pearls. *Tawam* is said to be a separate single pearl by itself, and not a twin. Aswad bin Ya'far says:

The pearl-adorned, steady cup-bearer has begun to pass the wine-goblet from hand to hand, her fingers stained red with mulberries.
That is, the cup-bearer's hands have become stained with wine in the manner of henna. She is squeezing the mulberries carefully and softly, and therefore, only the fingers have become stained. The poet has not mentioned dyeing with henna but only reddening through mulberries, so that the youth and wantonness of the cup-bearer may be emphasised.

Some have held that *yatīmah* is made from silver just as women's philtres are made from small pearls. The same thing has been said about *jummānah* which is taken to be *lū'lū* by some and to be a product of silver by others. These words frequently occur in verses. Imr' al-Qays, for instance, says:

When she bathes, drops of hot water upon her hair
look like polished pearls.

And further:

Tears began to trickle out of my eyes like *jummān* and *durr*.

Another poet⁷⁷ has said:

Did thy tears begin to trickle upon the camel-litter when thou heard-
est the dove moaning in the tree?

Hatim Ta'i says:

They have suspended from their necks rubies, *jummāns*, and rows of
pearls so that the eyes of the gazers may feast upon them.

Abū al-Tayyib says:

When we journeyed in the morning, the trees began to shed pearl-
like drops upon the manes of our steeds.

Abū Bakr al-Khwārazmī says:

We tiddled (the wine) when the hem of the garment of the night was
fluttering at half-mast and her eye-lids had been closed by sleep. As
if (someone) had split a white *jummānah* into twain, joining the two
by a thread.

Another poet has said:

We left the women of the clan to pick up *jummānah* grains near the beauteous mountains at 'Uwaynah.

Probably the poet wishes to say that the women, while returning, ran towards the high mountain through fear, and the threads of their necklaces were broken. When fear was dispelled from them, they began to pick the pearls again.

'Adī bin Zayd says:

She has put on a strong and hardy necklace round her neck, and a *jumman* which has been graced by the deft hands of virgins.

The poet has mentioned virgins as they have more leisure, and very conscious of self-adornment and desire husbands. It is natural, therefore, that they would exercise all care in threading pearls. Moreover, their palms would be uncalledous and soft because of their youth. Nābighah says:

'Virgins have threaded her necklace, row upon row, with pearls'.

These verses could point both to real pearls and pearls made out of silver. Dhū al-Rummah observes:

Rain falling from the clouds presents the sight of pearls twinkling on a rope.

Silk (thread) and *thaqb* (perforation) are surplus things. Both enter into each other. For example, we are apt to say, "I have put the ring on the finger," although it is the finger that is put into the ring.

Ibn Hamzah says:

They have upon them rubies, jewels, mercury-like silver and threaded pearls like the colour of the daylight.

Qays bin Mallūh writes:

She has upon her body, pearls made by the jeweller, as if the night has released her stone of dew.

Qays has used the word, *sawāgh* (jeweller), together with *jumman* in the above verse. This strenghtens the contention that the word, *jumman*, is used for artificially made pearls. Jewellers polish and decorate pearls; they do not make them.

A'shā says:

Anyone who gazes at Hawdhah would prostrate himself when he has seen him crowned. The jeweller has studded the crown with jacinthis, and thou woudst find them blemishless.

Khusraw Parwīz had presented Hawdhab bin 'Alī with a crown as a reward. According to Hanīfah, anyone, Arab or non-Arab, who saw it, prostrated himself out of reverence since the crown had the figure of Khusraw. It was customary to prostrate oneself when the figure of Khusraw was seen on the *dirham*. Aswad bin Ya'far says:

The wine (that was passed) by the nasal-accented and be-turbaned cup-bearer bought by the *dirham* evoking prostration.

When a verse mentions pearls, the latter could carry two opposite implications. The following verse by Labīd would clearly show that *jumman* signifies *lū lū* and not pearls made out of silver.

It glows in darkness like the ocean pearl bereft of its thread.
The maternal uncle of 'Ā'shā, Musayyab, says:

Like the ocean pearl brought out by the diver from
the middle of the ocean.

The genitive case in relation to the ocean clearly shows that *lū lū* is from the sea, not artificial. Jamīl bin Mu'mar al-'Adharī says:

White, and anointed with fragrances, her breast decorated with *jumman*, jacinth and rows of pearls.

In this verse the causes of adornment are jacinth and pearls and those small pearls that are like caesuras in verses and have been made out of silver and threaded with white silk. Ibn Ahmar says:

The rustling of the ornaments underneath her garments is like the susurrations of leaves in a storm. The jewels of *jumman* and jacinth present the sight of the fires of the plane trees bedecking fragrant hems.

This verse by Hudbah attests to *jumman* being artificial:

They have put on jewellery made in Madīnah. The *jumman*s are like the walnuts from *Dubā* having put on silken sheets.

Some lexicographers believe *jumman* to be the Arabic version of *gumman*, meaning belief, since the jewel creates suspicion in one's mind whether it is *lū lū* or like it. This verse would show that *jumman*s have been made out of silver, but no such doubt arises about *lū lū*. It is jewels that are like it that lead to doubt.

The earlier poet has brought out the word, *durr*, in the following distich rather elegantly:

My heart has been carried away by a slender-waisted damsel who has put on a flexible band around her neck. She was like a pearl in her beauty, a pearl that had been carried ashore by the sea.

But the meaning of the verse has one weak link. The object which the sea throws out is the dead shell, and its pearl is not free from blemishes. As long as the oyster is alive, it sits within the shell and does not collide with the waves which, otherwise, may wash it out. Masrūr has also come out with the same erroneous image.

Or she like that sheeny pearl which has smilingly stepped out of the shell after it has been brought to the shore by the foamy sea.

Mansūr al-Qadī says:

He is a youth who in his generosity is like a torrential rain. He is like the sea which when in commotion brings about death, and, in tranquillity, throws up pearls.

Mansūr, in the first distich, has not said anything which could be

constituted as building up of the theme through two connected images. Tumult in the ocean (*tamā*) has been compared with *radā* (discharging) and *ḥayd* (bounty) with *nadā* (munificence). These similes are too unnatural and illogical. Moreover, what he has said about the pearl is also illogical. It can only be called a beautiful licence exercised by the poets. If it is said that the tranquil ocean has discharged a live shell, it would be necessary that this event should have been preceded by quakes in the ocean as they occur on earth, till it had to disgorge whatever lay in its bottom. Had the poet said this much, the verse could have had some significance, but to say that a tranquil ocean has wafted a shell ashore is revolting to logic. Probably this is what rankled in the mind of a reproducer, and he changed the word, *yaqdhaf* (throwing or vomiting) to *yaf'iy* (granting).

We thus have the following verse by al-Mutanabbī:

Like the sea that throws jewels to nearby areas and sends clouds to far-off places.

Mansūr al-Qādī has taken this theme from Al-Mutanabbī:

It is the sea. Enter it if it is tranquil. If seized by storm, the boat is likely to be wrecked.

And Ibn Samawdah took from him (Mansur al-Qādi) when he said that

The sea is crossed when it is quiet;
but if it is agitated the boat is broken.

Poets have often compared their patrons to the sea. Abū al-Faraj bin Hind has used this simile in the following verses:

The sea keeps its treasures concealed in its farthest depths and throws up a spray of foam to those who come for it. Its least gifts for its guests are pearls which it grants only to those who look for them.

The presence of pearls at the bottom of the sea and the expulsion of foam upwards is a theme which poets have frequently resorted to. Thus Ibn al-Rūmī says:

Cadavers with nauseating stench come up on the waves, while pearls lie hidden in the dark depths.

The following verse has been attributed to Shams al-Ma'ālī:

See how the dead come up on the surface of the sea, while pearls in the greatest of depths rest tranquilly.

Thus pearls lie concealed at the bottom of the sea. It is for this reason that the wise ones have said:

O ye who dive underneath the sea! Look for food in the concealed nooks of land, for the pearl has been hidden from sight by the earth.

Another proverb runs as follows:

Jewels are in mines, while treasures are buried underground.

And still another:

Tilth is concealed by the earth, and manifests itself through tilling.

A poet says:

When I met 'Abd Allāh, I said to him, when he was going eastward on the altitude of Raqmatayn: "Search the hidden crevices of the earth and pray to God that He may grant thee victuals. Mayhap, He might grant thee thy wish and thou might get victuals."

It is said that 'Abd Allāh bin Jad'an saw inside a well carefully. People had thought that the well had only a projecting rock. But the rock had gold beneath it. 'Abd Allāh, on looking at the water, saw gold hidden in it. He recovered it, and grew to be very rich. He says:

I search for food underneath the well of Jud and go under the earth with a lamp.

Jud is the name of the well. 'Arwah bin Zubayr used to tell 'Abd Allāh bin Shihab:

What if thou hast no land? Hast thou heard the poet's dictum, search for hidden crevices of the earth and pray to God.

Poets often compare wine goblets to pearls and pearl shells. While the words are good, this could not be said of the comparisons. The good attribute of a pearl is transparency so that the interior of it is reflected on the surface. And this is the chief aim of the simile. Ibn al-Mu'tazz thus says:

Liquid ruby has been dissolved in a goblet that is like the shell of a white pearl.

Abū Nuwas says:

It appears as if pearl shells are studded on their faces, so tender and delicate are their countenances.

And further:

She is like a hind whom God has graced with pearl-shells in place of skin. The bloom of roses is all the time on her cheeks.

Sanawbarī says:

The course of pure cornelian is on the run, and the wine to the aqua of pure pearls.

Another poet writes about the non-transparent chalice:

As if our goblets are of silver filled with pure gold.

Ibn al-Rūmī says:

It is saffron in white goblets which spurts like the dragon's blood upon white cheeks.

Ibrāhīm Nazzām says:

Pearls are being offered for drinking in goblets of pearls. A pearl-like hand has suffused all these colours.

Another poet says:

Their goblet is made of the skin-of-the-pearl, with the water being of silver and the wine of gold.

It is still a worse practice to compare water with silver. This is because water itself has no colour like the limpid water and crystal and a white object like milk and white stone have been compared to wine without distinction: and therefore, each object has been designated white.

All the poets have plagiarised the theme built up by 'Abd Allāh bin al-Mu'tazz and Abu Nuwas. The latter has achieved a very high watermark in the following couplet:

Wine is jacynth and the goblet is pearl, and in the hands of the pearl is a cypress-like being.

'Abd Allāh bin al-Mu'tazz says about liquid gold:

We paid for it the price worth solid gold, and it has become for us liquid gold.

Another poet observes:

I measure to him solid gold, and he doles out to me a measured quantity of liquid gold.

One poet has tried to be ingenious:

On looking at the golden wine, I asked: 'Is this gold or are my *dīnārs* gold?' Both are of gold. Only *dīnārs* are gold solidified, whilst this is liquid gold.

A poet has come out with the following theme:

The cup bearer is passing wine from one end to the other from a sealed flask, and is doling to us liquid gold.

Abū Tammām says:

Or the virgin-white pearl which has been made pregnant by the red jacynth.

The poet has also mentioned virginity together with the pearl. Virginity gives off blood and pregnancy stops the flow of blood within the uterus. These things are recalled at the time of drinking! How well has a poet said:

When water was mixed with the wine, it seemed as if it was swallowing pearls and then disgorging them.

Tipplers sometimes swallow and vomit. This simile is much better than that in which the poet has compared wine with pearl shells, as pearls are white with a slight yellowish tinge, with a glitter which serves as an enhancement of the charms of the person lauded. Nor is it necessary for pearls to be transparent for that which is behind. Nusayb says:

As if she has been created from the flesh of pearls, since the morn of her beauty shines everywhere.

Manī says:

As if her skin is made from the pearl of pearls, with the craftsmen having removed the skin of the pearl.

Bashshār says:

As if she has been moulded by nacreous waters. Everywhere Beauty

seems poised for attack.

Buhtarī says:

Yellowness glistens in its colours. People prefer the pearl that has a yellowish tinge around it.

Āmidī states:

The slightly yellowish pearl is better than the one that is completely white. In a like manner, gold is superior to silver.

The reason for this is that a very white pearl which has been only recently taken out of the sea becomes transformed with age, with the change in its colour coming to suffuse the whole of it. It gradually becomes dark shading to brown. But if it has a little of desirable yellowness, it would be immune from this disease. It can be well believed that such a colour will not fade out.

Abū al-Qāsim defends the classical poets and holds them in a very high degree of reverence. He is not happy with the people who criticise them, but the authors who preceded Abū al-Qāsim expressed their preference for the colour of the coral over that of the white pearl on the analogy of Allāh's statement, "(In beauty) like the jacinth and the coral stone" with the argument that the countenance of the houris of paradise have the whiteness of the pearl and the translucency of jacinth, since in human beauty such a compounding of colour is admirable.

From this statement it is clear that whiteness is not restricted to pearls but is also found in coral stones. The whiteness of the latter also glitters, although this glitter is more pleasing in the pearl when it has a yellowish tinge so that it does not present the mortar-like appearance which we find in the Qatā'i pearl. The observer will take the latter to be artificial. Therefore, yellowness is considered good for the pearl in much the same way as, according to the previous statement, the absence of the yellow colour was considered to be good for it.

Moreover, the small pieces of precious stones strung in between pearls to space them from each other comprise, in general, small black shells, turquoise, or lapis lazuli, and quite often gold. The glitter of the gold is reflected upon the pearls and casts a yellowish glow upon them. Buhtari has, therefore, said that the surrounding area of the pearl should be yellowish. That is to say, the pearl whose edges would be yellowish near the perforation would be good. This is because of its sheen for if there is no shine, there will be no glimmer of the yellow colour.

Dhū al-Rummah, therefore, has said:

Eyes pencilled with collyrium, in her whiteness she has a yellow hue, as if she is silver with which gold has been admixed.

This mixture of colours creates elegance but this is rare. People do not buy a very pale slave. If a man is pale in colour without being overcome with the fear of something, he is then either jaundiced or is con-

sumed by anxiety and jealousy. For this reason, the adage, "silver in which has been admixed gold," is applicable here, since a touch of admixture is better than a full admixture. In this context a poet has said:

She is white with a yellowish glow. She has both colours – those of gold and silver.

Tufayl bin Ghanawī says:

She is wholesomely white, with a tinge of yellow. She is a beauty from *jaww*, where there is no man.

Yazīd bin Tathariyyah says:

Her appearance is sight-deceiving as if ivory colour has been mixed with olive.

Abū al-Qāsim says that the difference between the white and yellow pearl is the same as that between gold and tin. If his belief is based upon colour, it is objectionable, since the best kind of gold has a reddish tinge.

Should, therefore, pure silver be placed beside an absolutely white pearl, its colour would be better than that of the pearl placed side by side with pure gold, as it would improve its inferior colour. Whatever else has been written by Abū al-Qāsim is baseless.

Besides, the yellowishness of the pearl at times causes blackness in it, in which case both yellowishness and blackness are the results of accident, as in the beginning the pearl is free from these blemishes. Yellowishness in the pearl generates a tainted kind of yellow colour which is caused by many factors, e.g., oil, perspiration, saffron, olives and strong perfumes.

In the event, it is whiteness together with its appurtenances that is desirable in a pearl. Yellowness in it is a blemish and hardly desirable.

Abū Mansūr Th'alībī, in keeping with the general habit of poets, has said about the calligraphy of 'Alī bin Muqlah:

Whenever anyone's eyes gaze upon the calligraphy of Ibn Muqlah, his other organs wish they too were eyes. Pearls become yellow with envy and the rose red with shame.

It is not becoming for a pearl to turn yellow, while it is so with the rose. In the pearl, yellowness is counted a blemish while red colour becomes a rose. Some have interpreted the verse:

And they (shall) have large-eyed coy houris as if they are concealed eggs.⁷⁸

Not to mean eggs but pearls as in the following verse:

There serve them youths of everlasting youth, whom, when thou seest, thou wouldst take for scattered pearls.⁷⁹

And Allāh further says:

And there go round, waiting on them, men servants of their own, as they were hidden pearls.⁸⁰

Some exegetes hold that Allāh has coined the similitude of the white of

the eye with the sheen of pearls, since whiteness in the latter is desirable, and they are covered by eyelids so that they do not come to any harm. Others have stated that the eggs of the ostrich are implied, as they have a yellow yolk inside the white. Allāh has compared them to the countenance of houris as they have faces of that size; also women are often compared with them. The ostrich, while hatching its eggs, conceals them under its wings so that they may be safe from dust and air. Some other scholars have taken the implication to be darkness and turbidity. Whatever it be, the emphasis is upon the white and yolk of the egg. Imr' al-Qays says:

Like the first egg of the female ostrich whose white has the yolk nourished by wholesome water.

Exegetes, therefore, hold the egg to be the ostrich's egg. The purity and importance of the egg has been mentioned by the poet, as primacy is appreciated in everything, that is, the first egg that comes out after fertilisation. Some critics and interpreters say the poet has meant a pearl that is neither totally white nor yellow but bears a mixed colour. By virginity is meant the unperforated egg. About "wholesome water" it has been said that, while pearls are not cultured in sweet waters, they do not grow in very saline waters as well. A good pearl comes out of moderately saline waters and only such water is wholesome, not sweet, but the poet has employed the word, "nourished".

Interest in pearls is universal. Were yellow colour the only measure of merit, then yellow colour would have been preferable and preference for the yellow colour would not have been confined to one people alone.

Al-Kindī writes:

A pearl with a touch of yellow is liked by the people of 'Iraq and Al-Maghrib, and if there be more of the yellow colour it is preferred by the Isfahānīs. They are, therefore, brought from Al-Maghrib, 'Iraq, and Isfahān, and bear the eponyms of these places.

Humidity in Moist Pearls

When we use the word, humidity, in relation to the moist or humid pearl, we mean its shine and glitter, the delicacy of its skin, purity, and lustre. We tend to associate the wateriness of the pearl with its humidity which remains as a residue in the things that have water, and therefore, wateriness is employed interchangeably with humidity. This humidity is not the opposite of siccidity, just as the people of Īrān call gold *mast fishā'*. Abū al-Qāsim Āmidī has quoted the following couplet from Abu Tammām:

I have made the chosen pearl, that is, the verse into the symmetry of poetry, but it is the humid pearl.

Abū al-Qāsim says about this couplet, "By designating the pearl as humid pearl, Abū Tammām has taken the humid pearl to mean the fresh

pearl". This is his own interpretation, but it is certainly not very laudable. Abū al-Qasim compares the verses of Abū Tammām and Buhtarī claiming impartiality, but he is partial towards Buhtarī and criticises Abū Tammām. He is quite oblivious to the fact that Abū Tammām has put forward this theme (first), and the other poets have followed him. Every new thing, be it an animal, bough of a tree, or a plant, is necessarily as soft and humid, since it possesses the capacity to grow. If, therefore, a pearl is growing within the shell, it is essential that it should be moist, even though there may be a little humidity in it. The poet by humidity means lustre, even though the object may be harder than iron and stone.

Similarly, he has objected to the expression, "chosen pearl". He writes: "A chosen verse could only be a plagiarised one, and it is very reprehensible for a poet to confess to plagiarism". We do not know whether Abū al-Qasim has learned about the plagiarism of the couplet through sooth-saying, intuition, or star-gazing. We do not see even the slightest suspicion of borrowing. What is the harm if a poet says he has selected a verse that is superb, free from blemish, and after the exercise of the utmost care? See how Ibn al-Riffa' says:

I spent those nights in polishing a *qasidah* till it was free from all blemishes.

Buhtari says:

I have picked words in a way in which solid gold is picked for a *qasidah* on which are carved designs like those of *ashrafis*.

Provided no animus is displayed, this is what the selection and choice of words amounts to. How would Abū al-Qasim know whether Abū Tammām has not alluded to his own words rather than those of the other poets?

Another reason for the moistness of the pearl – and this does not strike the observer immediately – is that, whereas all the other jewels are stable as soon as they appear upon the earth, the pearl, because of the special property of its form, rolls. It rolls out of one's fingers, as they cannot grip it well. It rolls out like the seed of the apple or pear. If the seeds of these fruits are moist and they are pressed between the two fingers, they spring up because of their viscosity. Ibn al-Mu'tazz says:

The cup in the hands of the cup-bearer is like a bride having a rope of moist pearls round her throat.

Here the moisture is that upper layer of the wine that is about to be poured out.

Mansūr al-Qadī observes:

Laden with the fragrance of the bower, Zephyr has brought us salutations. Awakened by it, the buds began to smile, although their eyes were glistening like a shower of moist pearls.

Khubz Arzī says:

His drink is nacreous colour and the carnadine colour of wine mixed with milk. The apparent colour like that of the humid pearl filled with the colour of cornelian.

Another poet, Sanawbarī says:

In her garden the soft breeze bent the narcissus gently. As if they are the chalices of cornelian which are being offered to thee by the fingers of the lustrous pearl.

The same poet says:

Lustre-filled nacreous fingers are offering cornelian-like wine. She has a mole upon her right wrist like the black dot upon the heart.

Further:

As if she is made from a small black shell on which has been studded a lustrous pearl.

And also:

She looks like camphor in a horizon from which moist pearls are being showered.

Numayr al-'Uqaylī says:

Around her is a cluster of slim and delicate houris with coal-black eyes like fresh pearls that spell death.

The same poet says about a pock-marked person:

Pox has not affected her cheeks albeit it has inflicted a wound upon my heart. Like the moon of the fourteenth day is she, the moist pearl having left its imprint upon her.

Such, I swear by my life, is the attribute of the moist pearl; the verses perhaps are repulsive, but probably no revulsion is felt by the lover who is blind to all these blemishes in the sweetheart. When Sāhib bin 'Abbād heard the following couplet by 'Awf bin Muḥallam:

Eighty years — and may God grant thee eighty years too — have made my ears dependent upon an interpreter.

he explained: "This is rubbish from the point of view of language but beautiful rubbish nevertheless."

'Adī bin Zayd says:

If thou wast a prisoner — and God grant thou never would be that — thou wouldst readily follow what I am saying to him.

The following verse by Dhū al-Rummaḥ does not lag behind the preceding verse in finesse and delicacy:

With a countenance bright as the sun's, slim and graceful, having a slender waist and large hips, her smile is like a flash of lightning. As if her mouth is filled with wholesome wine, which I have not tasted.

Ibn al-Rūmī celebrates the above verse by Dhū al-Rummaḥ:

I have not relished the sweetness of her mouth, but from the odour of her smile I have found what it is like, just as the eyes of the spy betray him.

The pearl in this verse is opposite to itself – it being heavy upon the ears, revolting to the eye, suffocation to the nose, bitter to the throat, prickly to the tactile feeling, and anxiety in the bed. Well has Wawāi' Dimashqī said about a sick man:

When moderately yellowish-white, he became narcissus-like. Drops like broken pearls drip from his forehead.

Sanawbarī portrays old age, poverty, and itching in the following verses:

One of them is death, the second misfortune and the third destruction. If this itching persists, neither the skin, flesh nor muscles would remain. They look like unthreaded pearls upon the palms, at first like the grains of grapes, becoming larger thereafter. People call pimples that itch "the love of joke." May they die as (the bearer of) appellation has succumbed.

From the humid pearl, he has gone further and invested all jewels with humidity when he says:

The emeralds and the gold of her garland which have been threaded with jewels are humid.

He has extended the concept of humidity even to ordinary shells:

O thou wrinkle of the black shell, in what agony thou hast ensnared the pearl!

The astigmatic and errant approach adopted by Abū al-Qāsim towards Abū Tammām would be evident from his following verse in which he refers to the later's verse:

Every kind of eclipse is a blemish in the stars, and in the sun and the moon it is a major blemish.

Objecting to this couplet, Abū al-Qāsim says: "A star can only be eclipsed if it is obscured by another (member of the constellation). This can be known to the astronomers alone. There is no harm in this. Real harm consists in things known to the generality of mankind".

Now Abū Tammām has counted the eclipse of stars to be an evil happening. He holds the eclipse of the sun and the moon to be a most evil event. The poet has used the word *shadūh* which is superficial whereas the words *khusūf*, and *kusūf*, are employed for the eclipse of the moon and the sun respectively. Sometimes the sun and at others the moon is eclipsed. This happens during the phenomenon of waxing and waning. It is on the Doomsday only that both will be eclipsed together. Allāh has said:

But, when sight is confounded,
And the moon is eclipsed,
And sun and moon are united . . .

Some persons have used the word, *kusūf*, both for the eclipse of the moon and the sun. They use the word, *khusūf*, for the eclipse of the moon caused by earthquakes.

The eclipse of the stars is caused by the moon obscuring them, as it obscures the sun. This could be designated *khushf*. Eclipse of the stars, on the other hand, does not mean that their luminosity has disappeared, but that there has been a conjunction. Astrologers call this phenomenon *kushf* too.

Abū Tammām has, then, described the phenomenon according to the astrologers' concept. As the eclipse of the stars is but rare, people in general do not know about this. They are only aware of solar and lunar eclipses, particularly as they persist for longer periods. The sun and the moon signal day and night and prayers are offered upon their eclipse; the timings of the prayers are also determined by them. Prayers are related to dawn, early afternoon, late afternoon, sunset and night. People are generally demoralised by eclipses, especially when the inane predictions of the astrologers who regard themselves as the repositories of sacred and profane knowledge add fuel to the fire. However, for all and sundry, the eclipse of the sun is a major happening and that of the moon a lesser one. And Abū Tammām is a victim of Abū al-Qasim to a considerable extent.

The Names and Characteristics of Pearls Among Jewellers

The designations of pearls among jewellers are generally based upon similitudes and because of these their names have undergone changes with different peoples in different ages and regions. We have, therefore, avoided a discussion of these names given by Al-Kindī.

Lu'tū' is called *moti* in Hindīya. It was also a name borne by a famous Hindū Rājāh known for his conquests over the Turkish people near Kashmīr.

There is an ovoid variety of the pearl called '*Uyūn*. It is always spoken of as noun plural, not singular ('*ayn*). '*Ayn* is singular in the case of gold not plural ('*Uyūn*). It is round like the pupil of the eye. If it has a pleasing colour, good shine and lusture, it is also known as *najm* and *khush ab*.

There is also an oblong variety of the pearl. It is round on both sides and is shaped like the dung of the goat. Known as *pashkī* in Persian, it is also compared with the olive and called *zaytūnī*. At times it is called *khāyālī dīs*, i.e. like an egg.

The *ghulāmī* variety is globular, having an even surface and pointed end. It is a tapering sphere and is shaped like a long cap.

The *falakī* kind known as *badrīsgī* is Persian. *Badrīsahī* is a little round piece of wood or leather fixed on a distaff or spindle upon which the thread is wound. The *fawflī* is level, and has a cupola-like cover on the upper surface in the way of the arca nut. Then there is the *lawzī* and *shā'irī* kind with slender ends. In Persian it is known as *jawdānah*,

i.e., the barley grain. The *mudarras* variety is crooked like the molar teeth, and it has elevations and cavities.

The *qulzumī* variety is associated with the Red Sea. Its grains resemble those of the *mudarras* and *mudtarab* varieties. In the *Serāndībi* variety also there are the *mudarras* which present the view of several grains having coalesced with each other.

The *mudtanīr* variety has a kind of constriction in it. Rā'ī says:

The pleiades glimmer like the pearl that is constricted.

The poet has compared the whole constellation to one pearl, although the constellation consists of six stars. The southern half of this constellation comprises two stars and the northern half four. The stars are not, therefore, evenly distributed, and the northern half has the larger number. It, therefore, inclines eastward, while the opposite southern side is constricted.

The *muzannar* variety is called *kamarbast* in Persian. Some have taken it to be *kamarpusht*, i.e. having a crooked waist. It is constricted in the middle as if it has been tied with a thread on the sides. The buyer has to exercise considerable care while purchasing it lest it should have been made from the skins of two pearls of equivalent size whose interiors have been filled with a material which provides nourishment to the matter which does not dissolve either in water or the oil of the red juniper. The fact is that the skin of the pearl is arranged layer upon layer, as in onion. At times *muzannar* is made from the outer peel of the pearl. The pearl is made soft, polished, and bored with the implement employed by goldsmiths in perforating *jummanāhs*.

It is said that some pearls are made from mica that has been soaked several times, kneaded together with sublimated quicksilver, and imparted the shape of a pearl. Such gilding is brought about by placing a pearl in distilled vinegar and citron juice.

To sum up, I expressed the desire to purchase a few medicines and articles of necessity from a *Hājī*. Amongst these items were small pearls which were needed as ingredients in a cardiac electuary. A trader from Baghdad (who had these pearls) asked the *Hājī* who the purchaser was. The *Hājī* introduced me and told him why these pearls were required, whereupon he took out two pills whose colour was like the dung of the camel, and told the *Hājī*:

Tell the buyer that once I had considerable assets which I had inherited from my father. But I lavished all my wealth upon pearls, and presently I have only two left. Advise him not to waste his time and money on them like I did. Greetings to him.

Words are inscribed upon pearls, etc. Inscriptions that are desired to be preserved are inscribed by candle wax, while those that are not to be preserved are left as they are. The pearl is then dipped in concentrated vine-

gar to which sal ammoniac has been added. When it is taken out, the inscription desired to be preserved in the unetched shape goes down, while the waxed portion becomes raised. I think citron juice to which sal ammoniac has been added should prove to be even more effective.

A Chinese variety, known as *khushk āb*, is associated with the city of Qatā'ī. It has a pale colour, with its white colour informed by the colour of lime. It is, on the whole, lustreless and without glitter. It has the characteristics of gravel, and, for this reason, as opposed to *khush āb*, it is called *khushk āb* (without glitter). It is priced lower than the other varieties. People believe this variety to be artificial. Once Amīr Shahīd Mas'ūd importuned a (pearl) trader upon the genuineness of a pearl. The trader took out the peel of a piece with the knife, and asked the Amīr, "Could this have been made by hand?" But this cannot serve as an argument, since he who can make a pearl can also make its layers in such a manner that one peel comes after another.

The *Qulzumī* (of Red Sea) variety is similar as regards colour to the *Qatā'ī* kind, but for the fact that the colour of *Qatā'ī* is jaded, tinny, and darkish. Rāzī brothers say that sometimes the *khush āb* variety gets mixed with the *qulzumī* pearls. They have also mentioned that they bought a *ghulāmī* pearl in Qatā'ī weighing three and a quarter *mithqāl*.

Hamzah has mentioned the names of different pearls. One of them is the *shāhwār* kind, meaning regal. This is the best and the highest kind. Another name given to it is *gushāb*, meaning a large pearl. It is one whole pearl but seems to be compounded of several pearl grains. It is quite possible that the *mudarras* kind is also compounded like the *mutarakkab* kind. Another synonym for the pearl is *marwārīd* which is also called *ārāmarwārīd*. *Marwārīds* are small. One other name that has been mentioned is that of *darham marwārīd*. It is the biggest pearl, its Arabic adoption being the *durrah*.

Only the learned know about the noble attributes of the stars, whereas the commonalty of mankind has knowledge about the beauty and delicacy of pearls. Big and luminous stars are like the *durrah* (pearl). In some readings *al-kawkab al-durrī* is associated with these (stars). If we take cognizance of the claims of proper lexicography, and ignore the merely traditional usage of the language, we would find that the phrase, *al-durr al-kawkabī* (a star-like pearl) is more acceptable than *al-kawkab al-durrī* (a pearl-like star). The Arabs designate a kind of pearl as *najm* (star). The people of Arabia are fully aware of the fact that the Qur'ān has been made to descend upon them in accordance with their national ethos and customs so that the reader or the listener could fully understand and appreciate the text of the address. Abū Tammām thus says:

(It is) the pearl of favour, and not the shell, that has put a skin upon pearls glittering like the luminous stars.

Having described pure pearls, Nasr has also described other pearls, one of which is tin-like in colour. Some possess pale, white colours. These are designated as the *tabnī* (straw-like) kind. Some are sun-like (crimson) in colour; these varieties are known as the *yāsmīn* (jasmine) and *samīn*. The *Shīr fām* kinds are milky in colour. These colours are assumed by the pearl while it is in the shell provided that there is less water and the action of the sun upon them is more effective. The colour of the face and body of man is likely to be tanned by heat; the same thing is true of the pearl. A pearl of different hue is found in the sea around Serāndīb. It is reddish-white in colour and is called *wardī*. I have seen many pearls which were copper-coloured.

Among the inferior pearls, Nasr has mentioned a kind known as *sharābah*. Both layers of this grain are prominent, and, therefore, air enters them, drying them up in the process. When it is dipped in water, both its layers coalesce with each other. But such pearls are adulterated. Air affects both pearls, and they separate from each other. The deception becomes manifest. Among pearl-like jewels, Nasr has mentioned a kind known as *shibh*. It has a thin peel, with earth inside. It is not stable, and spoils after some time. The kind whose whiteness has a little of reddishness is called *warq*. It is also not stable.

Al-Kindī has given the name *kurwush* to one of the pearl-like grains. It has only one skin which is watery, and has blackish layers. On perforation it lets out water. The space left by water is filled with gum mastic.

The Prices of Pearls

Pearls are weighed by *mithqāl*s and priced by Nīshāpūrī *dīnārs*. The oval nature of pearls is determined through comparison with the pearls known as *najm* and *‘uyūn*.

Rāzī brothers write:

One *mithqāl* of the *najm* costs a thousand *dīnārs*. The price of five-sixth *mithqāl* of this kind fetches 800 *dīnārs*, while two-thirds *mithqāl* of the same kind is priced at 500 *dīnārs*; whereas half a *mithqāl* costs 200 *dīnārs*; one-third *mithqāl* 50 *dīnārs*; one-fourth *mithqāl* 20 *dīnārs*; one-sixth *mithqāl* 5 *dīnārs*; one-eighth *mithqāl* 3 *dīnārs*; and one-half of one-sixth *mithqāl* one *dīnār*. The price of the *ghulāmī* pearl is one-half of the *najm*.

Al-Kindī has said that an equivalent weight of the *Kha'idānah* kind is one-half the price of the spherical kind, while the price of *Muzannar* variety is one-twentieth of an equivalent weight of the spherical kind. According to Al-Kindī, stones similar in form to pearls are priced at ten *dīnārs* per *mithqāl*.

The price of the perfect *najm* is less in ‘Ummān and Bahrayn. Rāzī

brothers say:

If the Bahrinian *najm* that is spherical in form possesses all the attributes that go to make a perfect pearl, and weighs half a *mithqāl*, it is *durrah*, and its price is a thousand *dīnārs*. Such a pearl, if its weight is two *mithqāl*, is priceless and any price can be set for it.

The attributes of the *khāyah dīs* variety described by Al-Kindī pertain to the *khāyah dīs* kind which is even and spherical on all sides. It should be a little elongated. As for the *khāyah dīs* which is spherical on one side and elongated on the other, it is called *mu'qid* and is cheaper than the first kind of *khāyah dīs*. *Yatīmah* weighed three *mithqāl*s. It is so called because the oyster had died before the birth of the twin (pearls). A pearl like this is also called *farīd* as it has no counterpart among the pearls. Because of this fact, people are compelled to make it the largest pearl in the necklace.

Beside the Rāzī brothers, other jewellers have this to say about the weights and prices of pearls:

The prices of pearls are determined in relation to the spherical kind. The prices prevalent in Bahrayn are as follows: One-sixth of a *mithqāl*, 2–3 *dīnārs*; one-third *mithqāl*, 12–20 *dīnārs*; one-half *mithqāl*, 30–50 *dīnārs*; two-thirds *mithqāl*, up to 70 *dīnārs*; five-sixths *mithqāl*, up to 100 *dīnārs*; and one *mithqāl*, up to 200 *dīnārs*, where-after the price is scaled up by 100 per cent per every one *dāniq* up to the weight of a *mithqāl* and a half. There is an increment of 500 *dīnārs* for each *dāniq* after this weight. Two *mithqāl*s would cost 2,000 and three *mithqāl*s 3,000 *dīnārs*, respectively.

This is however, grossly unfair; the price ought to have been higher than this.

Al-Kindī holds the *dihlakī* kind to be tinny in colour. He says that is sold in Makka, according to the exchange rate of the Maghribi *dīnār*, at two *dīnārs* per *dāniq* and ten *dīnārs* for two *dāniqs* by weight.

Occasionally larger pearls are found among the *Qulzumī* ones. If free from dullness in colour and perforations, a pearl weighing three *mithqāl*s should fetch 600 *dīnārs*. A pearl that approaches six *mithqāl*s in weight is beyond any price.

The following table, which I have obtained, is of the period when 'Abd al-Malik Marwānī was the Caliph. It gives the prices of pearls (in his time). One *dāniq* has been treated equivalent to two *qīrāts* and a half. This has been the practice since then too. I have converted the comparative statement into a table, and although it does not appear to be satisfactory, all I can do is to reproduce it. Likewise, I can only collect and collate the different statements (about the prices of pearls) for the benefit of those who are interested in the information.

The pearl whose price is given should be pure, spherical, oblong, and

devoid of any blemish. The table is as follows:

Number of Pearls in Dirhams	Unit Price of a Pearl in Dirhams	Number of Pearls in Dirhams	Price in Dirhams	Number of Pearls in Dirhams	Price in Dirhams
Ka	Dirham and one-sixth	<i>Hā</i>	36	Dirham	8,800
Yaz	3	<i>Zā</i>	40	Dirham and one-sixth	13,500
Yah	6	<i>Wāw</i>	50	Dirham and one-third	21,000
Yah	7	<i>Ha</i>	70	Dirham and one-half	27,400
Yab	9	<i>Dāl</i>	85 two-third	Dirham and	33,300
Yā	12	<i>Sim</i>	202 and a half	—	—
Yah	15	<i>Bā</i>	775	Dirham and one-third	50,660
Ta	18	Two-third Dirham	1,275	Two Dirhams	66,066

There is so much variation and difference of opinion as regards the weights of pearls that the matter cannot be verified. I have not been able to determine whether this is so from the very beginning or due to the varieties which are not visible. Everything that is possible must undergo vicissitudes and unforeseen accidents. However the larger pearls would be weighed with the *ghubari* ruby with 100 of it as the standard. It is 65-1/3 and one-fourth, and in shells the standard is 62-3/5. Abū Dā'ud al-Ayādī says:

The pearl for which the trader made a dive into the sea and which remained with the venerable one on a shadowy day.

The merchant orders the diver to dive. The diver does not give any command; he is a worker who ekes out two *mannās* of flour and one-fourth *mannā* of dates. It is immaterial whether the shells he has caught contain pearls or not, and nothing comes out except flesh. The poet has equated the diver with the trader, just as we tend to associate farming with the landlord, not with the tiller, although it is the latter who performs the actual work. By "the venerable one", the poet means the chief of a people, a chief who is drawn towards the purchase of pearls, as it is the rich alone who can harbour the desire to buy pearls. If anyone takes the meaning of 'Azīz to be the 'Azīz of Egypt — the title of the Pharaohs — he would be merely transgressing the realm of understanding

and indulging in the sophistry of hair-splitting.

The poet has employed the expression, "shadowy day," as when there is no sunlight a shadow falls upon the pearl, and its lustre is redoubled. When the sun shines, the lustre of the pearl diminishes. When the sun is up, the pearl is like a candle that has been lighted during the period between sunrise and meridian. The fact is that the pearl glows when the day is cloudy and in shadow alone does its beauty manifest itself. Things are recognised through their opposites.

Craftsmen of all kinds at a special time and place display and present their goods and at specific places and times practice deceit.

Some have read the expression as *yawm tall* (a dewy day) instead of *yawm zill* (a shadowy day) without the diacritical mark. Dew falls at night and ceases to fall as soon as it is morning. It cannot stop the sun from shining; rather it reflects the light of the sun and, by moistening the ambient air, makes sunlight brighter. The poet implies that the pearl is with the venerable one in the absence of the sun. If there is a slight drizzle or moisture, a "dewy day" could be acceptable, since a slight drizzle could be compared with dew.

'Amr bin Ahmar says:

(Like) the lustre of the goldsmith's pearl which its maker has unveiled.

He wraps it in silk and brocade so that he may keep it clean and it may shine before the observer.

In these verses the pearl has been associated with the goldsmith, since he works with jewels and makes pearls out of silver. (For those who have suggested that *jumman* is made from silver, this relationship should be self-evident). Hassān bin Thābit says:

Beautiful thou wast when thou appeared on the day of departure in the courtyard of the palace.

More beautiful than the pearl which the king purchased at high expense and which the diver preserved so carefully.

Perforation in Pearls

Pearls are used for self-adornment. They are strung from some parts of the body and tied round certain other parts. But this is impossible without their being perforated and joined to each other by a thread. There would be no order and symmetry without this process in them. They lie concealed in the shell without any order. Perforated pearls are called *mathāqīb*, just as the plural of *mamlūk* (slave) is *mamālik* (slaves). Abū al-Faraj bin Hindaw says:

What aught is the price of a precious pearl until it is taken out of its shell?

And further:

The pearl looks graceful upon the bosoms of maidens. Its beautiful attributes do not manifest themselves in the shell.

Ibn al-Rūmī says:

Noble attributes are but rarely found among the obese ones. They are found the more among the slender ones. The pearl is strung by a thread. Its nobility and excellence refuse to be strung by ropes.

Books on medicine state that unbored pearls are used in collyria and electuaries to avoid poisoning. Jewellers are apt to fill the perforations in the pearls with poisonous matter which might harm the intestines and the eyes. People generally grind the pearls, although boring is also a kind of grinding. In curative treatment there is no distinction between the sizes of the pearls. But generally the smaller ones are used, being cheaper. It is the habit of the jewellers that, when they examine a pearl or a jewel, they first insert it in their mouth, moisten it with their saliva, and then dry it with their sleeves. This is a harmful practice, as it is quite possible that some other trader might have filled the perforation with some poisonous material in order to mask it. There are some poisons which are lethal in even minute quantities. There are, in fact some poisons whose odour is quite sufficient to kill a man. Therefore, no pearl or jewel should be inserted into the mouth until and unless it has been thoroughly washed and a thread passed through or tied round it. It is said that Hasan bin 'Alī (peace be on them) possessed considerable knowledge about jewels, and people, therefore, used to go to him to consult him about the prices of jewels. His death was due to poison from a jewel, and death ordained by Allāh acted in the form of poison.

Jewellers say that the pearl is not secure from harm even after it has been taken out of the sea and preserved with care if there is miasma, blemish, or a worm, or if one of its holes has been broken, giving rise to some new kind of decomposition, or if one of its layers has separated. This is why if a jewel has many holes, the jewellers hand them over to their unskilled pupils who are not familiar with the prices of the jewels. Unaware of the danger, they display eagerness and courage in working upon it and their hands do not tremble or shake with fear. A slight shaking of the hand would result in the marring of a whole piece. In fact, at times, they slap the pupils so that when they cry, they would become oblivious to the danger and go ahead with their work in a sullen manner. Once they have made the perforation, there is no danger, for what was inside has come out and the heat which was the causal factor for the miasma is driven off by the air which has entered it. Toothache is sometimes driven off when the teeth are drilled or a hole or cavity appears in them. The heat which caused the inflammation in them is expelled therefrom. In fact, occasionally the pain completely disappears if the tooth is taken out by the root. One of the reasons is that the corrupt

blood is expelled. Jewellers assign the job of scouring pearls and allied responsibilities quite often to their pupils as we have already stated in connection with the perforation of pearls. Labīd says:

Water scours their dams in the manner of the pupils polishing new pearls.

Removal of Blemishes and Defects from Pearls

Animals are more easily subject to decomposition than plants and the latter are more inclined to this process than the minerals. This decomposition process occurs in proportion to humidity and miasma when the heat is unable to push the miasmatic matter to the excretory organs which Nature has made for protection and expulsion. The pearl is also a part of the animal kingdom and is like the bone of man. As time passes, man's colour and complexion change, blood gradually drains off, and the body becomes subject to decomposition. Then old age is something that is irrevocable, and one cannot expect youth to return. The colour cannot be changed. The whiteness of the hair can be masked by the dye which is in reality gilding but the inexorable process of the change cannot be held back.

Sometimes this corruption is due to extraneous factors, e.g., dirt, sweat, vapours, oils, fragrances, etc. The best way to overcome this corruption is to cleanse the upper portion of the body through the administration of medicines.

It is said that if a particular pearl is hotter than other pearls, it might be construed to mean that it has a worm in it. Occasionally the worm becomes the causal factor for defects from the very beginning. The appearance of germs in the hair, flesh, and bones, infection, and the processes of being eaten away are nothing new or a matter for surprise. Ayās bin Mu'awiyah⁸¹ guessed the presence of a snake underneath a brick in the floor of his house, as this brick happened to be hotter than the rest without any extraneous reason.

Sometimes, a pearl is subject to defects within the shell. This is due to the defects inherent in its place of birth. For example, the *Qulzumī* pearl, if it gets mixed up with sand becomes petrified with it. Occasionally putrid water is left in the pearl, in which case the pearl is drilled, the water is drained off, and the space vacated by the water is filled with gum mastic. The *Ummānī* pearls are good because they have a good habitat, enjoy pure air, and the water is deep.

All this information that has reached us is like the many claims made by the alchemists. There is no proof forthcoming in their support except that they have got to be verified through experiment. We have not had the time to perform experiments upon these things nor have we trusted these people. They generally distort the original information and tend to

hide the real facts. They have especially mentioned fire, although fire would convert the bones to lime and, if used in excess, it would make them all lime.

This was observed when warriors had set fire to some temples in Hudūdīn wherein jewels were stored which were being burnt up. Dulhrā, the ruler of this place was Amīr Yamīn al-Dawlah's prisoner. He wrote a letter to Amīr Yamīn al-Dawlah: "These mad people are doing harm to you by burning the jewels which are in great quantities. Please have the jewels removed first, and then set fire." But, as was usual with the Amīr, he was obstinate and stubborn, and he ignored the letter. Later he searched for jewels having had the fire extinguished, and found nothing in the ash except for a few precious jewels and they looked as if *tabāsheer* had been rubbed upon them. The Amīr thus got nothing valuable from the ash but for a few red ruby pieces.

It is said that Arabs designate the pearl as *'aj* also since *'aj* was used by them in jewellery. A Bedouin says:

... Just as concealing the pearl and anointing with fragrances make (one) pale.

A'arābī says:

The ornaments worn by 'Umayra on hands are like *'aj* (pearls) with its yellowishness fine and fragrant

I believe he has not equated *'aj* with the pearl, since the pearl remains in good state if concealed. He has implied the ivory of the tusk which becomes pale, as the pearl also becomes pale. It is said that the people of Arabia and India made bracelets for their women from elephant tusks. They were narrow or broad according to the wrists of the women. The people of Arabia call them *waqf*.

Nabighah Ja'dī says:

Like the elephant tusk bracelet anointed with the fragrance of musk which Yemenite traders bring.

Nasr states:

When the water in the pearl has drained off, and it has become colourless and unappealing to the eye, it is placed in the fat of the tail of the sheep, wrapped in fermented flour, heated in water in a cup, and rubbed with camphor after being taken out.

The jewellers have this to say about similar conditions:

If buried in the earth along with ground rice, it regains its former condition. The same end is achieved if it is interred together with crushed bones and the expressed juice of the melon.

They also say:

A corrupted pearl should be dipped in concentrated vinegar, to which one *qīrāt* sal ammoniac, two *habbahs* natron, one *habbah* borax, and three *habbahs* ground salsola are added. The mixture

should be heated in an iron pot to boiling. The pot then should be placed in a vessel filled with cold water and washed with water containing the Andarānī salt.

But this practice gives rise to the suspicion that the upper portion or the surface of the pearl would get abraded.

They have also offered the following method:

If the pearl has undergone a change through the use of fragrances, it should be placed in an earthen urn together with soap, unslaked lime and Andarānī salt, all in equivalent weights. Sweet water and concentrated vinegar are poured upon this mixture. The mixture is then placed upon a fire of glowing embers. The froth of the soap should be scooped out until it ceases to come to the surface, and whatever is in the cup is not cleansed. The pearl then should be taken out and washed, and the pearls that have become pale or darkened should be placed in a swab of cotton and dipped in odorous camphor. It should be then wrapped in a burlap bag and suspended in a bath of pure quicksilver and heated on a slow-burning fire in a vessel for a period determined by comfortable counting up to one hundred and fifty. The vessel is then taken off the fire, and allowed to cool, exercising care that air does not touch it. If it is still impure, the process should be repeated. If the skin of the pearl happens to be dark, it should be kept dipped in the milk of fig for forty days, inverted into a cup to which equal parts of *mahlab*,⁸² castor, and camphor are added. The mixture is heated for two hours upon coal-fire without blowing and finally taken off. Should the blackness be internal, (the pearl) should be coated with wax, and transferred to a cup together with citron juice and the peel of *khadkhadah*. Citron juice should be removed and replaced every third day until the colour becomes white. If it is pale and the paleness is confined to its outer skin, it should be allowed to soak in the milk of fig. Later, soap, salsola and borax are added in equal parts, and the same treatment as in the case of the black pearl should be repeated. If the pale colour is internal, *mahlab*, sesame and camphor (ground to small grains) are dipped and covered with flour. The mixture is then placed in a pan and enough of *akārigh* oil is added as would cover the mixture. This is followed by boiling upon slow fire, twice. If the colour is red, the pearl is heated in milk to which are added Persian soda plant, camphor and Yemenite alum ground well, and kneaded with solidified milk and fermented bread. If the pearl has tinny colour, it should be kept dipped in citron juice for three days, washed with egg-water and preserved from air.

The Essence of the Coral

MARJAN: It is said that the word, *marjān*, is derived from the Yemenite word, *marajat* (that which has been mixed) as its essence is a mixture. But the same thing could, more or less, be said about the pearl. In common parlance, coral is designated as *bussad* which is a marine plant. Those who equate *marjān* with *bussad* have no other argument except that of the custom and idiom. All their armamentarium consists in a far-fetched educing and quotes. In Oribasius' book it has been stated that the musk is effective against melancholia, depression and cardiac pains, when unbored pearl, coral-stone, opium, honey and saffron are added to it. It is quite possible that Oribasius did not write the word, *marjān*, in his own language but wrote *bussad*, whereas the translator, according to his habit, wrote *marjān* in its place.

Marjāns are small pearls. Some verses bear witness to our claim and some are contrary to our view. Some of the verses are superb and edify the mind. Abū al-'Alā' al-Sarawī says:

'When she desired that we should weep, our eyes first began to rain tears and then shower blood.

Just as pearls and coral stones are strung always in necklaces.'

If the pearl and the coral stone are to be compared to tears and blood, perhaps the word *bussad* would not be appropriate. It is quite imaginable that Abū al-'Alā' has evoked this simile not on account of the colour but dripping. Abū al-Malik al-Hārithī says:

When they strung coral stones among pearls in their necklaces, they presented the sight of embers among the pellets of hail in their necks.

If we take *marjāns* to be small pearls, we would not be able to arrive at the poet's real purpose, since there is not much distance between the small and large pearls in a necklace. If anyone does this, the whole thing would present an awkward sight. The smaller pearls are inferior and would argue to the fact that the larger ones have not been strung. Large pearls are strung with the smaller ones for achieving proper spacing, while the smaller ones are threaded with the larger ones so that the sight first rests upon the larger ones. Sanawbarī says:

As if its trees have put on green robes and the crowns of pearls and coral stones have been put upon their heads.

A white blossom may have a tinge of redness or its bud may be a little reddish, therefore, the mind moves to the suspicion that the poet has taken *marjān* to be *bussad*. Abū Hayyāh says:

While she is talking to some young man, coral stones seem to be dropping out of the hands of the threader.

Bussad is a stone and, therefore, it is correct to designate it as *hasā* (gravel). But this word cannot be used for the pearl, as it is not a stone, although a pearl can be called *hasā* on account of its proximity, as jewels

that belong to the genus of stones are strung together with it. Besides, the species used for decoration purpose belong to the mineral kingdom. Also the pearl and the shell are of the same genus and the shell, etc., are denoted by *khazaf* (gravel). The word, *khazaf*, is actually used for an inferior kind of stone. Abū Nuwās says:

O pearl, in which shines the redness of pure gold

Crowned with pearls and coral-stones as if the rose is surrounded by the red anemone.

It appears from Abū Nuwās' verses that the white pearl has been threaded between two red stones, i.e., the ruby and the coral. If this is so, such threading would be defective. If, on the other hand, the poet means that the smaller pearls have been threaded in between the larger ones, and the ruby stones have been placed here and there to achieve proper spacing, so that their lustre reflects the reddishness of the ruby, we shall have derived a better meaning. Dhū al-Rummah says:

As if the threads of coral-stones are hanging from the neck of a desert hind.

There is no thread for coral stones, let alone the smaller ones. The coral stone can be bored and in that case it looks as if it has been tied by a thread. At times it is not even bored, but fitted to a gold or silver frame. This verse by Akhtal testifies to the fact that *marjān* is *lū'lū*, not *bussad*:

As if the drops are coral stones when they fall upon its back and sinews.

We should now discuss the sea which is the repository for the pearl and the coral stone and we shall have made our purpose clearer.

THE SEA AND THE RIVER

Lexicographers say about the sea that it is a mighty large volume of water that does not flow. 'Alī bin 'Isā has mentioned only the volume. He writes: "The people of Arabia call the salsuginous and sweet waters *bahr* if both are over-flowing in volume." God has said *marj al-bahrayn*, i.e., sweet and brackish waters. Hassān bin Thābit says:

My tongue is like a sabre free from any blemish, and buckets do not make my *bahr* (sea) turbid.

Now buckets are thrown into wells, not the sea but use of word, *bahr*, here is more appropriate. Abū Hanīfah Dinawarī has made magnitude to be the basic concept and defining the volume of water, says: "The seas of the land are extensive, and the singular is *bahr*."

Poet Kuthayyar describes 'Flood' as under:

It leaves the *arāk* trees knocked down,

fallen and blue, due to the oppressive blows of the flooding waters.

He(?) said: the rain water when fresh is clear but when it settles down it

turns blue.

In the *Diwān al-Adab* it has been said: "*Bahr* is called *bahr* as it is spread." Some have said that *bahr* is that repository of floods which has a broad expanse and has much water. *Bahr* in Arabic means a vast stretch of deep water (the sea). But occasionally *bahr* is used for big rivers to distinguish them from shallow streams. The Nile is designated '*Yam*' (the ocean) as the territory now constituting Egypt was once a part of the sea. The sea-water gradually receded and the land of Egypt emerged with seven estuaries. This information has been given in the early books. Writers have said about the sea that it is from *abhr al-mā'* i.e., *malūha* (from "the water that has become brackish") so that the water of the sea is brackish. Nusayb says:

The brackishness of the sea has enhanced my disease and the sweet water has become brackish.

Some have said: "It is called *bahr* as it is very deep, the earth cleaves, and it is below the sea level." *Buhayrah* is also derived from it. When a she-camel gave birth to a litter of five young ones, her ears used to be cloven, and such a she-camel was called *buhayrah*. We also say *tabahhar* – "deeply read like the sea" because a man so well-read spans knowledge from one corner to the other. It is called *bahr* because its water, owing to heaviness and turbidity, changes colour. It is said: *dammun bāhirun wa bahrāniyun*, i.e., when the blood is heavy and blackish. The great deep (*lujjah bahr*) is that sea from the middle of which the shores are not visible. Some lexicographers have said *lujjah* is called *sharm*, and the sea is also called *sharin*, as it carves a way for itself on the ground. *Sharm* and *bahr* also mean "to cut." And also he (Nusayb) recited:

My love for 'Ulwah makes me wish we were upon a rock in the sea alone, even though we had no wealth.

Khalīl writes about *yam* that it is the sea whose depth none may fathom nor are its shores visible. This is the *lujjah bahr*.

The expression, *yam al-sāhil*, is employed when the sea washes the shore. There is no difference of opinion about the fact that *yam* is the sea. The same word is used in Syriac. But the Qur'ān contradicts Khalīl, since the word, *yam*, denotes every collected lot of water. God says:

Therefore We seized him and his hosts, and abandoned them unto the *yam*.⁸³

The Pharaoh was drowned in the Red Sea, where today, the city of Qulzum is situated at the extremity of the bay. The Hebrews know it as *Sufuf* (i.e. *Al-Bardī*), since *bardī* or papyrus grows at the margin of the bay. In the event, this is against Khalīl's view.

Allāh has said:

When thou fearest for him, then cast him into the *yam* . . .⁸⁴

It is all too obvious that *yam* here neither means the Nile nor some

estuary of the river that went as far as 'Ayn Shams, where the Pharaoh resided. Whoever stood at one bank of Nile could see the other across. Allah says to Moses (about the golden Calf):

We will burn it and will scatter its dust over the *yam*.⁸⁵

This incident occurred in the desert of Tih. It is not possible that there was an ocean or lake or river there. It must have been a small tank, where rain water had collected, and where these people had come or a reservoir which collected the water from the rocks of the mountain. In the Qur'an the words, *yam* and *bahr* both are used, and 'Ajjaj has distinguished between both of them:

'As if the sea has overcome a larger reservoir.'

We have quoted whatever the lexicographers have written about the ocean. The lexicographer ought to know what he is writing about. But *bahr*, in fact, is that water towards which rivers flow and whose water does not fall into any river except when it turns towards the rivers during the tides, and that too temporarily. Such water becomes heavy through admixture with the ingredients of the soil. It is, in addition, so saline that it passes beyond saltiness to become very bitter. Some people say it is called *bahr* because it passes an absolute prognosis, e.g., in acute diseases. *Bohrān* (the crisis of a disease) is so called because it gives an absolute prognosis about the sick person. Also, as in *bohrān*, the causes of the tides are mysterious. A storm could persist for two days and sometimes for two months. Thus *bahr* and *bohrān* both give verdict in their tidal movement.

Shells and the Occurrences of Pearls

The bony structures with which marine animals guard themselves against predators are also the genus of shells. These shells are called *khazaf*, e.g., the scales upon the crocodile's skin, the two leathery shields in the case of the tortoise, saucer-like structures of shelled animals, snail-shells, etc. These structures can appear in all kinds of water and in such places as are characterised by humidity and moisture in the air, e.g., Jurjān and Tabaristān.

Animals having an outer shell and the snail are called *kawhalah* in Jurjān. The fluid of the animal whose canal is filled with flesh, which has two fleshy horns which penetrate into it like a bifurcated bough and come outspread, discharging a fluid, has been called *sadīd al-halzīm* (the pus of the snail) by Galen, as this creature wets the ground when it crawls along. When this liquid matter dries up, it becomes like shiny saliva. We were brought some snails from the wells of the Zarūbān mines. They were discovered after digging to a depth of 150 cubits. The size of the walnut, they had very thick and stony shells. They had markings described upon themselves – as if the designs had been inscribed

upon the duct of the animal. The shells were, however, devoid of the creatures that had inhabited them. Instead, they were filled with the earth having become petrified. I could not determine whether this characteristic to petrify was in the earth before excavation or whether it became petrified after excavation. Some soils do possess the characteristic to petrify. Observation has shown that the earth of these wells was even with the ground. The size of these shells and conches was determined by the nature of their habits, locality and the water, since marine snails are larger and their shells are thicker and harder.

The people of India call them *sankhs*, and use them as whistles instead of musical instruments. They also cut them longitudinally and make them into structures that are similar to water-cups. They are very white – the colour of the white earth from which lime is made. I once saw a *sankh* whose back was dark and turbid and had a colour like a lustrous pearl inside.

Wada' (*Conchac veneris*) is a kind of shell. Zangī's collect them when the water is in low tide and put them in a pit. This pit is covered till the animals inside die and their flesh putrefies and disintegrates. This is the practice followed in the islands of the Indies. The people drive palm stakes into the ground. When the water is in high tide, the conchae *veneris* cling to the stakes, these conches cut off the stakes when the water recedes, and the Zangī practice is followed.

These are two kinds of islands in the Indies. From one kind are fetched woven coir fibres. These are used for stitching the boats employed by these people. They are called *kusārah* by these people. The other class of islands is that from which conches are brought. These they call *kūrah* (cowries). The people of India use them in place of coins and gamble with them, as people gamble with counters and gems. The cowries are used for decorating the cheeks of camels.

Some kinds are the size of eggs. They have backs marked with dots and having slight reddishness. They are strung from the necks of animals, and are used for polishing the gold used for gilding books. They are called *minqāf*. A cowrie which has its right speckled side curved to the right is rare. It is considered to be holy and is bought at a high price. People give them as gifts to the kings of Habashah, on account of the uniqueness of this article. We see that there is the custom of greeting important persons with *rāmishnah*. *Rāmishnah* is a leaf like the *gul-i-'Abbās*. It has become bifurcated and presents the appearance of two leaves fused together. It is quite possible that this venerated cowrie is the sovereign of cowries just as honeybees and other animals have their own kings, as there are also different *ummahs* like us.

There is a kind of cowrie which is very small and white. These cowries are collectively called *sumūm*. Their singulars are *sam* and *samat*.

They are worn by Bedouin and Arab maidens round their hands and feet.

Many marine animals cling to the hulls of ships. They are shelled and are called *kaslir*. They are very sharp and penetrating and they are, therefore, scraped by means of iron scrapers. Such cowries are also found on the shore, but when they receive warmth from the sun and the wind blows, they get spilt and seeps into them, and they get broken. Some have said that they get spilt as the cowries, gravel and shells from the coast get mixed with them.

The people of Basrah make from them mortar-like stones and mill-stones but not for grinding or pounding but for covering bins.

Etymologists believe (and Ibn Jinnī has quoted them) that the word *sadaf* itself derives from "*sadaf yasdifu idhā mala*" (when it turns away) since it runs away from the pearl. Hence its name, *sadaf*.

He could as well have said that it was in shape like sides of two mountains facing each other. This explanation could also have been acceptable. When the nacreous shell is opened, both its sides look like this, although they are inverted from the earth. Small shells are called *bulbul* and the larger ones *mahār*. Imr al-Qays thus says:

Its hoofs are like mother-of-pearl, and gravel flies to the right when it propels itself forward at such high speed.

Khalīl bin Ahmad says that *mahārah* is the flesh that is inside the *sadaf*. But it is the animal that is inside the *sadaf* and no one calls this animal *mahārah*. The word, *mahārah*, is used for *sadaf* only, whether it has any flesh or not. Rā'ī says:

They arrived at daybreak at Maqrīr, with their eyes sunk and their hoofs like *mahārah* (mother-of-pearl).

The meaning is that they (the mares) reached Maqrīr at daybreak. Some have held *Maqr* to be the sea-coast. They had their eyes sunk, their strides long, and their hoofs like large mothers-of-pearl. Abū Hanīfah says that *dilā'* is a kind of marine mother-of-pearl. In the *Kitāb al-Jamharah* it has been said that *qabqub* is a mother-of-pearl in the sea whose flesh is eaten. If this be so, then all shells are *qabāqib*, since they are all roasted. People like their flesh, and their taste is like that of a roasted egg. It is through experience only that one can learn which shell is the mother-of-pearl. These shells are sold at the coast of Aden. The sellers cry-aloud: 'Take this *jawz al-bakht*.' *Makhshalab* is also a synonym for the mother-of-pearl, while some say it is the pearl (taken out) from the mother-of-pearl. Others have held that *makhshalab* is the glass which is threaded into the silver ornaments of Bedouin women. Thus Abū al-Tayyib Mutanabbī says:

The sun looks blackish beside her fair countenance, and the pearl looks like *makhshalab* beside the pearls that drop from her speech.

When some one objected saying that *makhshalab* is not an Arabic word,

he said it is a correct Arabic word and has been so employed by 'Ajjāj in his couplet.

However, Mutanabbī has borrowed this theme from Jarīr:

As if it is a white cloud at the gloaming and a pearl with the brightness which no nacreous shell could hope to match.

Ibn al-Rūmī says:

When they donned precious pearls, the pearls blushed. They became pearls and the pearls, mother-of-pearl.

Another poet says:

Where would you find in the clouds the beauty that is in rain-drops?

How can you get the beauty of the pearl in the sea-shell?

Still another poet has said:

She had a look of surprise when she looked at my tattered clothes.

How would the pearl know that it has had its birth in the mother-of-pearl?

The mother-of-pearl has two layers joined to each other at their backs and the mechanism is such that the animal inside can open and close them at will. The animal is encased between these two, and clings to them. It crawls on the ground with the help of these. The animal is extremely slender and these two sides perform the function of pedals when it crawls. This crawling is taken to be swimming. These two layers move one behind the other, and secure food together, as they have neither eyes nor ears.

It is said that its mouth and ears are inside the head, but the ears are there to hear, just as the eyes are to see. This animal is composed of a snotty sticky viscous liquid matter, and its flesh, joined to the two sides, is blackish. While it is very young, it visits the littoral areas and in this state it is called *bulbul-i-ratb*, as it is very fatty then. The best kind is that known as *mahār* which is adult and firm, and becomes hardened on attaining old age. It sheds off its fat, and becomes more handsome. It begins to inhabit the lower regions of the sea. Even if it goes to feed at night, it does not go far beyond the depth. It prefers solitude, and does not move near its compatriots. It is this kind that is known as *mahār*. It is said the Sea of Oman has a mother-of-pearl called *khargūsh* in that it looks, because of its length, like the ear of the hare. It contains large, excellent and clean grains. The deeper the mother-of-pearl, the less will be the heat reaching it and its grain will be excellent and lustrous. This is what the Qur'ān implies when it refers to concealed pearls, i.e., concealed but it is the pearls hidden in darkness that shed lustre. Big mothers-of-pearl are generally devoid of pearls.

If these mothers-of-pearl contain pearls, they are large. Those that contain pearls in abundance are not larger than the palm. The mothers-of-pearl in Bahrayn are half of these.

They have few pearls and if at all any are present, are as large as the grains of the mother-of-pearl.

About the birth of the mother-of-pearl, it is said that it is like the mace leaf when newly-born. It then clings to the hulls of ships and boats. It is large and progressively becomes petrified. It then settles deep into the sea and later the pearl has its birth in the shell automatically. There is no relationship between rain and the birth of the pearl. This is just like saying that *husr* is born on boats.

Nasr, following the current opinion of the people, has said that the pearl has its gestation with rain and is then nourished by the oyster. It is actually like the human saliva which is cleaned by swirling it in the mouth. The argument given by these people is that, if there are more frequent rains or if they fall beforehand, pearls are produced in greater abundance that year. This is what Al-Kindī says from experience and observation. The pearl is attached to the animal. When cut, only half of it gets broken and cannot function either for adornment or ornamentation purposes. This, however, is the case when it is very strongly attached to the shell in which case one has to do a lot of rubbing and cutting. If, however, the attachment is slight, it is easily detached from a piece like itself and is used with stones similar to it. The pearl that enters the flesh of the animal is movable and its layers go on progressively increasing and one layer appears over another, otherwise only experience would show.

Nasr writes:

When the rain-drop falls upon a nacreous shell, it freezes. The shell keeps on growing, while the drop that is admitted into its mouth, rolls and becomes a good and wholesome pearl. The drop that falls upon a certain angle becomes crooked and does not stay evenly in that it rolls away from the saliva. Sometimes its obliquity is due to the shell having pressed it. The effect of this compression upon it is lasting.

The best pearl is the one that collects one layer upon another and congeals to form a pearl. The pearl present in the black flesh of the animal which is attached to both its sides would not be without blemish.

Nasr has discussed the compression exercised by the shell and the effects created by it. The material of the pearl is soft at the time, as is the case with gold which has different forms within the soil. From these it would appear that gold at the time of solidification was soft and moist like flour. This is why it accepts the impressions and markings made by the gravel whose support it seeks, and, when the water passes through different routes, different shapes are assumed by it. As for Nasr's statement that the layers are one over the other, he probably implies that all

of them are born together, and begin to coalesce, as is the case with onion peels. Onion peels appear simultaneously, each one of these begins to grow, and till the time of ripening reaches its maximum density. Nasr's statement, however, also leaves room for the assumption that one peel appears after another and the possibility that he saw them during different rains cannot be ruled out.

Al-Kindī writes:

The pearl grain in the *bulbul* is close to the animal from both sides and the superior kind of pearl is that which is close to the ears and the mouth. It is, therefore, said that the large kind is within the gullet of the oyster which it keeps on rolling. The grain, therefore, becomes a spheroid. Its layers go on increasing and it grows larger.

The argument given in favour of one layer following the appearance of another is that, if the uppermost layer is removed, the interior is like the shell and it has no lustre. The same is true of the second layer. This would show that the surface of the inner layer was open at one time as was that of the upper one.

It is said that pearls are like bones and spheres for the animal. The thin flesh of the animal is sustained by them, and they derive power therefrom. It is necessary for animals to possess bones and cartilages to move from one place to another. But this does not seem to be correct, since it is said *bulbul* is liquid in the beginning, ripens and grows till it becomes *mahār*. It is, therefore, but essential that there should be large pearls in *mahār* as it is necessary for *bulbul* to have smaller pearls, since pearls would grow within *bulbul* as the bones grow until they reach their maximum extent in *mahār*.

Some authors have also mentioned the lustre of the external portion and have argued that the layers appear one after another. This argument is wrong too, as every peel of the onion is bright and it becomes harder and more lustrous, while the interior remains soft, turbid and rough, although the peels did not appear successively but at the same time.

We could quote the examples of old men whose upper teeth have become worn off through mastication, and also the space between the teeth of the elephant, even though the teeth of the elephant are not arranged in rows.

God alone knows the secrets of the creatures. How could man know about them, travelling as he does from the sensible, tangible, to the abstract. He ponders over the nature of brass; how one layer has been put over another; he ruminates upon the nature of the teeth; he visualises how one bone has been joined to the other in the skull, the cavities filled, so as to form a beautiful form, while they were apart from each other before. But if he believes that all these parts or organs had had their gestation at different times he would be wrong, although the matter

is secret, because of their smallness, and we have been unable to observe.
Pure is that Being Who has created everything and Great is He!

Sites for Diving

Places where the diver plunges in the sea in order to bring out pearls are known as *maghāsāt*. These places are celebrated. It is towards these places that victuals are delivered for the clients of the traders and wages for the divers according to how far the site is and how long is the duration which the diving would occupy.

These places not only have nacreous shells, but one can occasionally get *mahārs* as well while journeying between the coast and the sea, and precious pearls can rarely be found in them. The *Bahr-al-Akhdar*⁸⁶ is specifically marked for this. Its depths and bays have celebrated *maghāsāt*, e.g., in the deep of (the sea around) *Serandīb* as the Persian Gulf, and *Bahrayn*, *Dihlak* and *Clysmā*, or as a new diving site which has been recently discovered in *Sifalah-i-Zanj*. One's thought moves towards the Sea of *Sharghūr* which is to the north of China and is a branch of the ocean too. The Mediterranean Sea is larger, but since it has parted company from the *Bahr-i-Akhdar*, it has been deprived of the nacreous shell. I have not heard from anyone that pearls have been found in the Mediterranean Sea, but it may be that through further attempts they may be found.

At times, however, there are lets and hindrances in diving. The Red Sea, for instance, has no site for diving, since it abounds in dangerous animals, e.g., sharks and *qursh*.

It is because of this *qursh* that the *Quraysh* have received their name as they used to eat it. Pearls are taken out from the Red Sea, from the shells of dead animals after the waves have thrown them shorewards. These shells become corrupt in water, putrefy under the sun and worms grow within them. Prospectors find them in a dry state and see the shells and the pearls within, eaten.

The same thing is true of the Sea of *Sharghūr*. Pearls are taken from shells whose animals are already dead. These shells are thrown towards the shore and they are dried by the sun and air. This is why the pearls of *Qatā'i* are turbid, lustreless and leaden.

According to the persons who have brought these news, cold weather and the great depth of the sea are obstructions for diving. The pearls, therefore, found in these shells are not spherical and un-eaten. There is little doubt that cold poses the greatest obstruction in diving, but the site to the north which is comparatively less deep is not forbidding for diving in summer.

The persons who have brought us these reports say that diving is interdicted by the depth of the sea, and the depth of the sea of *Sharghūr*

is fathomless. This statement is contrary to the belief that the nacreous shell is not to be found in the stormy sea. If this is true, the dead molluscs must have been brought by the waves from the more pacific regions of the ocean! It is quite possible that the turbid colour of these pearls is due to the locality, soil, water and food of the animal, just as leadenness dominates the pearl from the Red Sea. This colour is also to be found in the Dahd pearls, although the pearls are recovered through plunges in the sea, not picked from the coast. But they show the leaden colour of the Red Sea pearls, as their characteristics resemble each other both by way of the sea and the soil. The island of Dihlak is in the first part of the bay. It later joins the Indian Ocean after passing the different defiles. The land of this bay being marshy, it is fairly possible that it might have caused change in it, and, because of its putrefaction, might have caused this "eating away". It is said that the *qulzumī* shells reek of an odour similar to that of castoreum, but those found in the Indian Ocean and the Persian Gulf possess a pleasant odour.

Al-Kindī has mentioned Ḥlah and Sūwīs while describing the Red Sea. This sea is called the Sea of Ḥlah and Qulzum at times and at others is spoken of in singular. Ḥlah is situated towards the Red Sea from Jār and Sūwīs is situated towards Aden from Jeddah.

Al-Kindī also says that the *bulbul* from Ḥlah is like the *bulbul* from Sūwīs, as the pearls from Sūwīs are sticky and look artificially made. The shells of both are disgorged by the waves from the sea.

The best *maghāsāt* are in Persian Gulf. The *maghāsāt* of Bahrayn are especially of high quality, as they promise more profit and less loss, and are superior to the others. Next are those *maghāsāt* that are close to them, and are situated between them and Siraf. Their pearls are known as *qatārī*. This name is not derived from rain-drops nor because of their resemblance with them, but because of a locality in Bahrayn, which includes a ship as well.

Rā'ī says:

Is it a fleet-moving Yamani or Qatārī? It has a shroud of dust.

They will have taken the Bahrayn pearls from the shells once they have thrown away the dust of the path.

Nābighah says:

Has the pearls captivated thy heart that thou hadst been constantly speaking of it like a lover in travail.

The pearl that hast been brought to thee from the sea of Yaman by a respectable Habashi emissary.

Having youths carrying spears in company, who were the servants of Caesar.

He comes from Alexandria every year as a depu on Udulay.

The whole of the coast of the Persian Gulf serves as *maghāsāt*, ex-

tending from Makrān up to Bahrayn. They then intersect the celebrated localities of the Red Sea to the coastal regions of Shihr, like Sarjamhet (Arabic, *rā's al-Jamjah*) and Majīrah. This region is collectively spoken of Masīrah and Mashkat which is Masqat. This chain continues up to Aden and Dihlak, provided there are no obstructions we have already described in connexion with the Red Sea. Diving is performed up to the extreme depth of the sea. There is a *mughās* in Lujjāh' Barbar along the straits of Aden on the Ethiopian side.

Al-Kindī, besides having described these islands, has also mentioned the island of Socotra and has spoken rather highly of the Barbar pearls. He says they are white, thick and of good-quality and if they are round and spheroidal, exceed all other sites for diving. He further writes:

They are brought to Ethiopia from Aden. They have *mahārs* instead of *bulbuls*, and rarely does a pearl occur in them. If any comes out, it is like the 'Ummānī pearl.

Nasr writes:

The animal in the shell does not part from the depth of the sea as long as it lives. When it, however, dies, the waves throw it away on the coast, although the grains get spilt because of its death, with the heat of the sun and the air adding to the process of decomposition till the pearls become wrinkled and shrivelled.

Once the diving season is up, the divers prospect for these spoilt shells round the shore, and take out the grains that have undergone change. Sometimes the peel lifts on its own, and the grain inside remains intact after the peel has come off.

In his work, *Aslīkāl al-Aqālīm*, Abu Ishaq Al-Farisi (Al-Istakhari) has said:

Adjacent to the upper coast line (of Iran) there is the Island of Kharak. There is a *maghās* here as well, but it yields very little. But, if any rare object is procured here, it exceeds all others. It is said that *durr-i-yatīmah* was taken out here.

About the *maghās* of Serāndīb, Al-Kindī has this to aver:

It is not used for diving for fourteen years, so that the animals may get the time to grow. Then the divers use it for fourteen years. If they get hold of a fresh *bulbul*, they throw it down into the sea so that it may attain maturity.

The pearls obtained here are small and slender, and are often like the teeth and clear. Sometimes the divers plunge during the interregnum accidentally. The immature *bulbuls* are thrown into the sea again.

Depths of the Diving Sites

The first thing which we have to bear in mind is that boats and ships are plied in the direction of the deep waters of the sea in order to steer

clear of the storms and the rocks, but diving is not performed in the middle of the sea at great depths.

The depth of the sea is fathomed by means of *bā'* and *abrād*. *Abrād* is a ball of lead which is lowered into the sea by means of a slender rope, so that an estimate of the depth may be had. The clay, sand or mud which clings to the rope provides an idea of the topography of the area and of the depth it has plumbed. *Bā'* is also spoken of as *qīmān* and *dirā'* as *banjak*. Experts say that the *qīmān* extends from the middle finger of the left hand to the left nipple. It is more than two *darā's* in length. Others, however, say that it extends to the right nipple.

Anchors are cast according to the wind, waves and depth, so that the ships may remain stationary. Anchors comprise an ablong piece of iron, having arms, the like of which we see in the feet. They, therefore, get fixed to the bottom of the sea. There is a ring at the upper end to which a rope is tied. These anchors are in keeping with the size of the ship, and the weight of an anchor varies between one hundred fifty to three hundred *manās*. The ship stands still when the anchor catches the bottom. This then becomes like a port for the ship. People call the port *bandar*.

There are different statements concerning the depths of *maghāsāt*, and different estimates have been presented. Some have shown their depth to be fourteen *qīmān*, some eighteen *qīmāns*, and still others forty *dirā'*. If one *qīmān* is assumed to extend from the middle finger up to the right nipple, these *dirā's* will not amount to more than eighteen *qīmāns*, which is the quantity of the *maghās* at Barbarah.

Nasr says that the depth at which diving takes place is sixteen *qīmāns* and a *qīmān* is equivalent to one *bā'*. If so, the depth comes to more than sixty *dirā's*, but the case is otherwise, and not as has been written by Nasr.

Seasons for Diving

Al-Kindī writes in this context:

The season for diving is from the first week of April to the end of October, as the sun circumscribes a distance from half Aries to half Libra.

Nasr writes:

Diving is spread over six months from the *Nawroz*⁸⁷ to *Mihrijān* (the autumnal equinox).

The period given by Nasr corresponds to that given by Al-Kindī except that the former has computed the period in Persian months which do not correspond to the solar year, and are moved backward and forward.

Probably both these authors have taken two forths the spring and the summer. We have already stated that the Persian Gulf is tranquil in these days and, when there is a storm, diving becomes impossible. For the

same reason, diving in the Indian Ocean in the two quarters of the summer and the winter would become impossible.

Besides Al-Kindī and Nasr, others who have seen diving being done in the Persian Gulf, say that the period of diving is two months when the temperature is high and the heat is considerable. During this period, the water at the depth of the sea is tranquil, while for the rest of the period it is agitated and turbid.

These people say that, during the winter, the river water diminishes, as also the water that falls into the Persian Gulf. This is the reason why at the end of spring and at the advent of summer, the water in the sea diminishes and diving is possible. When the air is hot and the rivers are in spate, the water of the sea becomes turbid. It becomes difficult to hold the breath and diving becomes impossible.

This bears witnesses to the statement of Yashū Bakht, the priest of Persia who says: Divers find it difficult to hold back their breath in sweet water. In brackish water one can hold his breath for a longer period.

The Nature of Diving

If we wish to find the real nature of diving, we should turn to Arabic poetry, especially that of Mukhabbal Sa'dī with the following verses:

I paid a considerable price for (the pearl) which had been brought by one having slender bones and the shape of an arrow. With oil rubbed upon his chest, he took it out of a stormy and *lakhm*-riddled sea.

The poet says he has bought the pearl for a high price from a slender-bodied diver whose chest was anointed with oil so as to be safe from the heat of the sun and brought out the pearl from a sea that was in spate and had the dangerous *lakhm* fish in it. The *lakhm* is a dangerous fish which attacks with its large and long tail. It is called the *jamal al-bahr* (the sea-camel). These couplets shed light upon the dangers latent in diving. Ibn Ahmar says:

The diver saw in the storm of the sea, horrid scenes, large vortices (*harāqala*) and fishes.

Being furious and persistence, he cared not a whit for his life, although once he was very concerned with regard to his life.

Harāqal means the largeness of a thing, while '*anidan*' means 'furious'. The poet 'Ajjāj says:

Or like a hug mass of water (Ocean)

With high waves abounding in frightful creatures.

Farrā' says *lakhm* is the frog. Abū al-'Abbās 'Ummānī says: "*Lakhm* is *pīshwāz* in Persian. It is not dangerous: it is *Kharast* known as *kawsaj*⁸⁸ that is dangerous." Lexicographers say that it is a marine flesh-eater. Its head is like that of the lion and it harbours them (its young ones?) in its stomach, gestating them through the mouth. It has twelve

rows of teeth. The crocodile has only two rows. People of the sea call it *hazar*. From the description of its young ones, it would seem that it has two ears, since every animal possessing ears delivers children, while the animals having hidden ears deliver eggs only. Abū Hasan Turunjī in his *Kunāshah* writes: "*Kawsaj* is a blackish fish, having a concave back, and is without fins. Its teeth are like saw. When it bites, it turns over and revolves like a mill till the organ of the man (attacked by it) detaches itself from the body." If *lakḥim* is not evil, then its mention is useless. In Arabic verses we frequently find the oil of the diver mentioned. Mutlammis says (some have said that these verses are by Musayyab, the maternal uncle of Ashā):

It is like the pearl picked by the diver from the midst of vortex in the sea, the diver who is broad-mouthed *ashghā* and spits out oil in order to search for the pearl, thirsty and poverty-stricken. His father died for him and then he said: "I shall either die like my father or make an earning for life." He dove into the sea at the meridian and his companion was unaware (of his performance).

He got his desire and he brought that which glittered like an ember in its shell.

He was offered a high price for it but he declined. His companion asked him: "Why sellest thou not?"

Asma'ī says *ashghā* is a broad-jawed person having spaces within the teeth. He further says: "Abū 'Ubayd al-Qāsim bin Sulām says that the poet is describing the diver who has had his mouth filled with oil. When he dives, he spits it out so that the sea might get illumined and he might see around himself.

Qutāmī says about plunging into water and the diver:

Or like that real pearl which was picked by a slender and pale Indian. Who reached it in a boat that was being buffeted by the waves, but he was intrepid.

A broad-bottomed boat coated with pitch: When the water buffeted it, it penetrated into it.

When at last the boat reached the middle sea, the diver divested himself of his clothes and disappeared into the sea.

A never-ending sea that is a killer from which the oarsmen seek protection through fear.

The penetrator of the sea who spits out oil with a large volume of water above him.

At last he got it and death almost suffocated him in the teak-wood broad-bottomed black boat.

The divers of our age are not familiar with these things. They observe the water around themselves carefully, open their eyelids, and the salinity of the sea does not do them any harm. Besides, how can oil have

light? As for God's statement:

Whose oil would almost glow forth (of itself) though no fire touched it.⁸⁹

It is obviously meant to emphasise the pellucid nature of the oil. In the event, what we have been observed and experienced is against what has been heard from reports. Nasr in his book writes:

The jewellers say that anyone desirous of learning how to dive stuffs his ears with cotton until the ears begin to fester and worms begin to breed in them. Later on, there appears a narrow hole in his neck through which he can breathe in the water in the usual way.

It seems that in the original manuscript the fact that the cotton swab should have been moistened is missing, since, I believe, putrefaction and the appearance of worms are possible through the agency of moisture only. Al-Kindī has reproduced the same thing differently:

The novice first begins to learn how to hold back his breath and in order to breathe has the root of the ear perforated. Blood and pus collect in the hold and begin to flow towards the mouth. There are thus two holes. When the wound cicatrises, breath begins to enter through these holes. In this way the diver can stay in the sea for longer periods and can hold his breath for over a quarter of an hour.

The diseases of the ear and the throat are common. Just as sound and the ear share the capacity to instruct and apprehend, breath consists in the expulsion and the entry of the air so that the heart may receive comfort and the innate heat is purified. The heart needs more of the cold external air, while it does not require the hot air that is expelled from inside, since it is like the expulsion of the excreta. The heart of course requires the expulsion of air since the contents of the chest have to evacuate the air so that fresh air takes its place.

Even if we concede that the diver breathes through two holes, this breath can be of one kind only, i.e., of the nature of expulsion. This, however, cannot tranquillise the heart; in fact, the diver would feel all the more suffocated, and the substitute for which he is looking will not enter. Whatever would go out of the two holes would be air. Where, then, is the second kind of breath going to come from, since there is no air there? And, if water makes its entry, it can prove lethal. Fresh water is of no use to a person who has been drowned and when there is no room for its expulsion. I take all these things to be based upon rank idiocy. Divers told these tall tales to merchants, and these two learned authors, having verified these tales, offered different exegeses and explanations.

Nasr writes – and his statement has received support from many quarters and many an observer has said the same thing – that when a diver intends to dive, he waits for the afternoon and the meridian, so

that the sea gets lighted up and he can see whatever is in it. He then casts his gaze to and fro till it perches upon a shell which looks as if it is an even surfaced stone. Lying under the water it looks like a large plum to him although in reality it is the size of a grape. The diver climbs down a crooked ladder made of the wood of jujube. Around one side of his waist is tied a black stone weighing twenty-five to thirty *mannas*. The diver propels his mount with an oar-like object till he reaches close to the shell. He then begins to swim, bark and shout so that the harmful animals give him a wide berth. He keeps both his nostrils plugged with two ivory or cypress pieces as they do not open in the water. He casts his anchor with a cloth piece and hangs a reticulate bag made of cannabis twigs from his neck to keep the shell in it. He then places both his feet upon the stone and hangs from the rope. He progressively goes down and surfaces up by the same rope. He then keeps the stone in a brazier inside his cloak and wends his way towards the coast. The black stone is carried by the divers to scare away a creature in the sea of which they are afraid since it kills them. This creature flees at the sight of the black stone. If the stone bears white or some other marking, this creature, taking it to be some foodstuff, attacks it. At times, when it pulls the stone, the brazier turns upside down and is lost. The diver as soon as he sees this creature, leaves the stone and surfaces so that he may be free from the danger posed by it. He swims coastwards, shouting and taking long breaths (he is unable to breathe while in the sea). He then wraps himself thoroughly with a blanket and lies down for a little while till he begins to perspire. He then gets up and goes about his work. From the middle hour between sunrise and the meridian he can dive at the most three to four times. He takes his food after he has finished diving, not before. During this period the oysters have died by undergoing an opening and shutting movement. The diver searches for the pearl by splitting open their mouths. Should one of the oysters be alive, it would be difficult to open its mouth since it tightens its stomach very strongly. If the diver works for himself, he keeps the pearls, otherwise he hands them over to the merchant. He is the owner of all the other material he has obtained aside from pearls.

If the diver does not get any shell, he loosens the rope and moves to and fro like an arrow, and fills his bag with whatever he likes. It also happens that two divers fight over a pearl-shell and the more powerful of the two is the winner. If he does not get hold of the nacreous shell, he gets hold of the animals belonging to the species of *azfar al-tib*. These are like intestines, with ventilators on both sides, having the *azfar al-tib*.

Al-Kindī writes:

If he (i.e. the diver) misses the shell, then among the items he collects is a hair-like object with which are made the bracelets of the Kurds.

They are called the *sh'ar al-harūbah*. This is plant of the deep sea, but I have neither seen the bracelet nor the plant.

As for the workers, they leave with the trader in the boat. They are six or twelve in number. One of them makes a dive, his companion holding the rope, they get higher wages on Fridays.

Nasr has written the same description as Al-Kindī except that Al-Kindī has described a bdellium brazier in place of the jujube brazier tied together with ropes.

Al-Kindī writes:

He straps the brazier by suspending a stone from it. It acts like the anchor of a boat. When he ascends upwards, he jerks the brazier into movement for the reason that the sea-water is heavier and it is easier to ascend in it. See how bitter the sea of Zughar is and anyone who enters its water cannot stay there.

About the closure of the nose, Al-Kindī writes: "It is nose-ring like the horn, the back of the tortoise, or ivory attached to the nose."

Those who have observed it say it is the twin branches of the horn into which the nose is pressed. The nostrils are thereby compressed. The labourers number from six to twelve. I can only believe that this number is proportional to the space in the boat. I see no other reason for this number. Among the animals that gulp the diver or cleave him into two is mentioned the *qursh*. It drags up the brazier. If the stone is not black, it swallows it, and occasionally tears up the ropes with its teeth in which case the brazier does not turn upside down.

As for Nasr's statement that the diver utters barks and shrieks in the depth of the sea, I think the mouth cannot be opened there, and, when the mouth cannot be opened, how can any sound come out? How can sound come out without the expulsion of air? And, if air is expelled, water of necessity will enter and take its place.

If the diver could open his mouth (while in the sea) why should he shout to suck air? This is even more impossible than his description of breathing through the hole in the root of the ear.

A superintendent of the traders who had a personal experience of such boats said that the shells taken from the sea are deposited in the treasury until the animals in the shells have died. It is then easier for what is inside to be taken out. Medicines for expelling malodours are used, and, since the pearls are in the small guts, it is not necessary to make them putrefy. Those averse to putrefaction prise the shell open immediately after the animal inside has expired, since the live animal tightens its stomach so strongly that it is difficult for one to open it.

Antarah says:

He is like the diver's pearl, brought by one with brown moustaches and prised open from the shell.

By the diver the poet means the trader and by the brown-moustached one, the labourer, since these labourers are *Īrānians*. By *tashirīq* he means the prying open of the shell.

Qays bin al-Khatīm describes the isolation of the pearl from the shell and the removal of flesh from it:

As if he is a pearl brought forth by a diver and whose countenance has been purified by the removal of the shell.

A man from Baghdad has said that the divers have devised a new method in our age, eliminating the need to hold back one's breath. The divers can roam about in the sea from morn till noon; in fact, they can remain in the sea as long as they like. It is up to their employer and how much he pays them for their labours. This new device is made from skins which the diver puts on up to the portion of the body below the breast and tightens it round the ribs. He then makes the dive and benefits from the air inside the skin.

But this device should have as much gravity or ponderousness as to be in the depth of the sea despite the presence of air in it. It makes one think that a pipe made of leather is attached to the skull from the upper portion of the device. It would be as broad as the sleeve portion of the device, its pleats filled with pitch and wax. Its length would be proportional to the depth to which the diver would like to go. The extremity of this pipe would be joined to a large broad-mouthed basin having a hole at the bottom with a bottle or two filled with air attached to it sideways. The diver would hold or release his breath in them and stay for long – in fact for days – in the sea. These pipes must be having such gravitational force that they would remain submerged and not come up, but their gravity must be less than that of the air to ensure that the necessary quantity of air reaches the diver. God alone knows best.

Stories About Pearls

The Rāzī brothers have said that they saw a compact pearl in the treasury of Amīr Yamīn al-Dawlah. Equivalent to the areca nut in size, it was symmetrical and weighed two and two-third *mithqāls*. Its price was computed to be thirty thousand *dīnārs*. It was named *yatīmah* in an idiomatic manner, since every pearl that is unique deserves to be called *yatīm*. It is also, therefore, called *farīd*. The word, *yatīm*, applies to a pearl that is celebrated.

Mutanabbī says:

'And as if his words are *farīd*, *durr*, ruby and *sām al-rikāz* (pieces of gold).

The central pearl strung in a rope of pearls is the *farīdah*, whereas by *durr* are implied the pearls which surround it. *Sām al-rikāz* is the vein of gold found in gold mines. Here the poet has implied the gold pieces

strung on the thread for spacing.

Abū Bakr Fārisī says:

The date-tree's sapling resembles it, it is the shell alone that yields *lu'lu* and *farīd*.

Heaviness in the pearl is to be appreciated for two reasons: first, since it bears witness to a body that is compact and organised: and, second, because it argues for a bony body, as the heaviness of the pearl would be in proportion to the body. A poet thus says:

He smiles with teeth like the rope of pearls which has been threaded by one desiring perfection. They accused him of having large teeth, to which I said: "The larger (the pearls), more precious they would be."

Ibn al-Rūmī says:

When thou becamest heavy in the balance, thy pan came down, and the smaller people went up.

When the pearl is heavy, it is set on the upper part of the crown.

Ibn al-Mu'tazz says:

The pearl reposes in the bottom of the sea, and the dross remains upwards within the froth of the sea.

And yet in a blackish state it is picked out of the green abyss of the sea. Later it is studded on the crowns of magnificent and great kings.

A poet belonging to the tribe of Rabī', satirising Banū Qahtān, writes in a rejoinder to Abū Nuwās:

The beginning and the end of esteem for the pearl, in whose quest divers go on board the boats. If they do happen to find a pearl that shines a star, there will be no buyer for it among Banū Qahtān, and (the members of the tribe) will become sad.

It will then be brought before one of our kings who does not care much for wealth and is generous.

When he has purchased it for a high price, he will have it set in the necklace of his best steed.

ʿUbayd Allāh bin ʿAbd Allāh bin Tāhir has distinguished between the twin pearls belonging to the same shell:

Sometimes two pearls are found in the same shell and it is the jeweller alone who is aware of the price of pearls. The price of one is beyond all estimate, while the other is less costly than even the shell.

Durr Yatīmah was brought before Hishām bin ʿAbd al-Malik. His wife ʿAbdah bint Abd Allāh bin Yazīd bin Muʿawiyah was sitting beside him. She was so fat that she had to be supported when she wanted to get up. Hishām said to her that, if she was able to get up without any support, she could have the pearl. She made every effort to get up, but hardly had she got up than she fell down on her face, and blood began to gush out from her nose. Hishām washed her face and gave her the pearl. It is

said that this pearl weighed three *mithqāls* and had all the attributes of a perfect pearl. It was spherical, pure white, exquisite and possessed lustre. Nasr writes:

The weight of *khāya dīs* was two and two-thirds *mithqāls* and it had been purchased for 70,000 *dīnārs*.

With the end of the Umayyad dynasty, 'Abd Allāh bin 'Alī was appointed administrator for the sale of the assets of Marwān bin Muḥammad. Someone told him that 'Abdah had *durr yatīmah* and two earrings in her possession. Abd Allāh sent for her and demanded these things from her. She asked whether she would be spared the delivery of other things if she parted with them. On 'Abd Allāh's reply in the affirmative, she brought the pearl personally and handed it over to him. 'Abd Allāh then said: "Choose some place for yourself so that I may treat you with kindness." On 'Abdah's mention of Syria, he made arrangements for her journey to that country.

But then he felt afraid lest Saffah should know about it and ask him about her and her whereabouts. He despatched a slave from Kābul who led her astray and killed her. In the Qur'ān we read:

Did He not find thee *yatīm* (destitute) and enrich (thee)?⁹⁰

The Sūfīs say that the Holy Prophet has been called *yatīm* and the objective is to compare him to *durr yatīm*, the priceless pearl, the position of the Holy Prophet being unique among men and he being the last Prophet.

Ibn Jassās mentions that the price of this pearl during the reign of Muqtadar-bi-Allāh was 120,000 *dīnārs*. It was said that but for the *farīdah* pearl, its price would have been fixed at 500,000 *dīnārs*. Buhtari says:

Thy kind act towards me is like the brightness that puts even the sun under eclipse. If thou honour me with one act of kindness after the other, well would it be, for pearls look good when threaded.

It is said that the *yatīmah* is with the Carmathians at Ahsā'.

Abū 'Abd Allāh Al-Husayn bin Ahmad bin Al-Jassās was a person of many parts. One of his chief qualities was that he was an expert on jewels *par excellence* and surpassed his contemporaries in the knowledge of jewels. He was at the same time very rich, and had the appellation of the Qārūn of the Ummah. Ibn al-Munajjim presented a *qasīdah* to Qādī 'Alī bin 'Abd al-'Azīz in which it was said:

O Ibn 'Abd al-'Azīz, not everyone who possesses wealth is held in veneration by the expectant ones.

Bring someone as rich as Ibn Jassās but let him be generous like Ibn Barmak.

The Qādī took a million *dīnārs* from Ibn Jassās and had him incarcerated.

The mother of the Caliph, Muqtadar-bi-Allāh, was very fond of jewels. When Ibn Jassās was released from the gaol, he saw a hundred bales of thick cloth being transported to the Caliph's palace. Ibn Jassās went to the mother of Muqtadar and begged for the restitution of the bales. These bales had come from Egypt and each bale had valuables worth a thousand *dīnārs*. He got all of it on the spot and made considerable profit from it.

Ibn Jassās kept a selection of pearls in a box. He used to send for it whenever he felt depressed and to place the jewels in his lap so that the heaviness of his mind might be dispelled. One day he was sitting by the side of the fountain in his garden with the jewels in his lap when he was arrested. In extreme agitation he threw all the jewels into the flower bed. When he came out of the prison, he saw that the plants, flowers and the grass in his garden had withered away. He lost all hope of tracing out the jewels. But when he cast a glance at the place where he had flung the jewels, he found all of them intact; they had neither been picked up by birds nor rats. He collected them all and his broken back also improved.

His third quality was his foolishness. He was a most idiotic person. Abū Bakr Sūfī has heard from 'Abd Allāh bin Sulaymān that the Caliph Mu'tadid-bi-Allāh used to say:

There are three wonders of the world. Two of them are non-existent and exist in name only. One of them is the *'unqah* bird of the west and the other is *kibrīt-i-ahmar*. But there is a third wonder which is in existence and is stranger than both. This is Ibn Jassās, who despite being the most foolish of men, is an expert on pearls.

It is one of the signs from God that, despite his foolishness, he did an excellent liaison work between Mu'tadid and Khumārwayh, conveyed to the former what he had been entrusted with, and appraised Mu'tadid correctly.

It has been said about Ibn Jassās that someone called upon him to offer his condolences upon the loss of his son and said: "Have patience; do not be impatient; may God console thee." Whereupon Ibn Jassās said: "We are not accustomed to death."

Sūfī has written that, after the Caliph Mu'tasim had his palace built, he held an assembly in which all the members of his family joined. He put on the crown with the *durr* 'Yatīmāh studded on it so as to impress the spectators with the magnificence of his kingship. Ishāq Musīlī asked permission to recite a panegyric. Given permission, he recited the following *matla'*.

O thou abode of my love, hoariness of age has destroyed thee. How I wish I could know what hast made thee so old!

Mu'tasim took this to be an ill omen. The spectators also winked

at each other to express their surprise on how Ishāq who had been a companion of the Caliphs and chiefs, could read such a verse. This ill omen, however, proved to be true, because Mu'tasim left for Surra Man Ra'a (i.e., pleased is he who sees it) and never visited this palace again. The palace became desolate and no assembly was ever held in it thereafter.

The Rāzī brothers mention a pearl having dark veins running through it. Different kinds of colours are found in pearls, silvery, white, saffron, dusty, coppery and blackish.

I have seen the blend of these colours in one pearl, but such pearls are rarely to be found. They look, however, odd for this reason. Extreme white and black have been observed in shells, as if their circumference was made out of these two hues.

The Rāzī brothers further write that the treasury of Sultān Mahmūd had one date stone and an olive stone each. Parts of both had become pearlish, whereas a part retained its original state. We have not been able to ascertain whether the shell eats fruit-stones or stones. Being an animal, it is but essential that its nutrition should be according to its own nature. Besides, these authors have not mentioned whether the stones were lying together with the pearls so that the probability that the fruit-stone had developed layers could have been more acceptable. Or that one layer could have given rise to another could also be a probability likely to be inferred. This is, however, different from what has been described by Al-Kindī. About this pearl, Al-Kindī has said that (the shell) had a large pearl which was visible in sunlight and before the candle. It had a layer which, on being stripped, revealed a stone in the cavity. But this has also been accepted as an impossibility.

Such stories and legends are found in every city. You will hear such stories about every pearl you are likely to see. This story will be claimed to have been based upon actual observation backed by some authority.

The diadems and necklaces of kings had bead-like jewels. These were called *kharzāt-i-malik* and were studded for calculating the year. They looked like the counters of the players who gamble and play for stakes. With the lapse of one year, one bead was added so as to know how long a certain king reigned. The same process was repeated in the case of his successor also. Labīd said about Nu'mān when he was killed by the Khusraw:

He guarded *kharzāt al-Malik* (the counters) for twenty years. And another twenty years till overshadowed by death, he died.

The Khusraws of Persia also had these counters except that they employed pearls of high quality instead: and they had the extra quality of looking pleasing to the eyes.

The poet, Farazdaq, says:

Upon his forehead you will see the royal counters. He is very quiet and the lustre of his teeth is very much there.

Abū Nuwās says:

The greatness of the Rabī tribe is as the greatness of 1/5th compared to 1/10th. In Makkan days they overcame a great ordeal. They secured the counters of the Caliphate, priceless and without peer.

The Khusraws had a kind of rosary having twenty one pearls. Hamzah has given its name as the *lashk-i-shumārāh*. The number of the pearls in the rosary corresponded to the chapters (*lashk*) of the *Avestā*. These were joined to each other without any space in between, and the king swirled them in the morning as a practice.

Māmūn al-Rashīd cherished a great love for Wāthiq. He used to take the latter along with him on journeys and keep him close to himself on the mount. One night the camel-driver began to chant a ballad. Māmūn felt afraid lest Wāthiq should wake up. He could not call out to the driver also for the same reason. He then broke the thread of his rosary and began to pelt the driver with the pearls. The attention of the driver was at last drawn. Māmūn made a sign asking him to be quiet. In the morning he told one of his private attendants where he had dropped the pearls. They were recovered, but on that night they functioned as stones.

We have not been able to ascertain much about a rosary which belonged to Umm Ja'far Zubaydah. But this much has been mentioned that one day she and Harun had a discourse about the piety and theological learning of 'Umārah bin Hamzah bin Maymūn. Zubaydah's contention was that the smell of money and wealth is liable to make even the staunchest piety to waver. She asked the Caliph to call him and make him a gift of her rosary, which was priced at 50,000 *dinars*. If he refused to accept the rosary, she would be convinced of his piety. Harūn sent for him and engaged him in a discourse upon some important subject. He then offered him the rosary which 'Umārah, having thanked him, placed on the same spot. Zubaydah thought he had forgotten to take it with him. She despatched a messenger along with the rosary. 'Umārah said to the messenger: "If thou speakest the truth, let the rosary be thine." The messenger returned and said to Zubaydah that the rosary had been made over as a gift to him. Zubaydah gave a thousand *dinars* to the messenger and took it back. If the story concerns the rosary, it must have been of ruby or of good pearls. Another version which also figures 'Umārah, has Saffah and Umm Salmah Makhzūmiah as the main characters. He expressed pride over his race and cited 'Umārah as an ideal slave. However, this story also pertains to 'Umārah, although it mentions a different Caliph and his spouse.

Jewellers have the following incident to relate too. When Qutaybah

bin Muslim conquered the fortress of Baykand, which is in the vicinity of Bukhārā, he saw two pearls in the fire-temple there. The priests of the temple told him that two birds flew atop the roof of the temple in succession and dropped the pearls down. Qutaybah sent both the pearls to Hajjāj with a letter. Hajjāj wrote to him in reply:

I have been able to follow what you have written. But I must express my surprise at the two birds and the two pearls. But beyond all this wonder is that, O Abū Hafs, you have bestowed these pearls on us instead of appropriating them. Peace be upon you.

People used to equate the wealth of Abū al-Haḡīq with treasury, and the title of this treasure was *misk al-jamāl* (camel skin) also, as the jewels were kept wrapped in the skin of a kind, covered with an ox skin which in turn had a camel skin over it. The jewels were held to be worth 10,000 *dīnārs* and women used to borrow them from him on the occasion of marriage and other festive occasions.

When the Holy Prophet (*sa'am*) besieged Khayber, the people of Khayber requested that their lives be spared and that they should be allowed to leave. Peace terms were struck on some conditions. Among the conditions laid down were that they could carry all that could be loaded upon the beasts of burden, that they would not transport gold and other precious objects, and that they would not hide anything precious. Failure to honour these conditions would violate the treaty. The people of Khayber, however, broke these conditions and transported stealthily the skin bag having the jewels belonging to Huīy bin Akhtab which had been brought to Khayber when Banū Nudayr were exiled from Madīnah. The Holy Prophet asked Shu'bah ibn 'Amr about Huīy's skin. He said that wealth of the skin bag had been spent in the war. The Holy Prophet said this was impossible, as it was full of jewels only a few days ago and there was considerable wealth hidden in it. Huīy had been slain only a few days earlier. The Holy Prophet then ordered Shu'bah to be handed over to Zubayr so that he might be able to extract a confession out of him. Shu'bah at last confessed that he had seen Huīy hovering round such and such cave. After the skin bag was located, Shu'bah was arrested, executed and the contents of the skin were distributed.

It is said about Hajjāj bin Yūsuf that he asked one of his governors to send him a quiver which had pearls studded on it. (He used the word, *fabahrij bihī*, that is, to walk away the usual path).

Bahraj is an Arabicised version of a Persian word, meaning a rejected thing. This word is, really speaking, of Hindiya origin. In Hindiya a good thing is called *bhalā* and a rejected thing *nabhalā*. In Persian *Pahlā* means good, and for this reason the people of Persia call their languages *Pahlawī*, that is, good or superior to all other languages.

Arabs call a counterfeit *dirham*, *nabahrāh* and use the same word for

the path which is out of the way. This incident pertaining to the letter occurred among the Arabs, and *bahraj* means something rejected among them. Some authors have interpreted this to mean that Hajjāj had requested for the inferior kinds of pearls. But can it really mean that Hajjāj had requested for inferior pearls? This is the interpretation made by Abū Muhammad al-Qutaybī. I personally believe that what Hajjāj meant was that the pearls should not be brought along well known routes but along a path not trodden by people so that they would be safe from robbers or poll tax or *ushr* might not have to be paid. This is what the bringer of the pearls exactly did, and the pearls were brought safely and securely.

When Qabiha instigated her son, Mu'tazz, to connive at the killing of his step-brother, Mu'yad, this evil woman sent a rosary to the latter's mother in the month of Ramadān. The price of the rosary was estimated to be 4,000 *dīnārs*. She sent the message that she should recite (verses from the Qur'ān) while telling the beads. Mu'yad's mother ground rosary in a mortar, packed it in a piece of paper, and, returning it, told the messenger: "Greet my sister and tell her that the fever of the heart is not dispelled through the rosary."

Al-Hākam-bi-Allāh's ambassador, 'Alawī' Tahartī, had the 'Alawid known as the Amīr of Madīnah killed. Al-Hākam became fearful lest Amīr Yamīn al Dawlah (Sultān Mahmūd of Ghaznah) should mount an offensive against him. Al-Hākam, in fact, was not quite sane. In a fit of insanity he ground all the jewels belonging to himself and his sister so that Sultān Mahmūd would know that he was impoverished and he would not be tempted to launch an attack against him.

Al-Kindī has described a rather interesting incident.

Hārūn al-Rashīd gave Yahyā bin Khālīd (Baramakī) a pouch containing jewels for safe keeping. Baramakī returned to his house, placed it down casually and went out. One of the servants who cleaned the floor took it away. Yahyā then remembered about the pouch, but could not find it in its original place. He felt very sad. I was sitting by his side when he sent for Abū Ya'qūb, the blind soothsayer. When he came, Yahyā commanded all those present to be quiet so that the augury might proceed smoothly. When Abū Ya'qūb arrived, Yahyā bin Khālīd asked him: "I wish to enquire something from thee. Tell me what it is." Abū Ya'qūb bent his head a little, and replied: "Sire, you have sent for me to enquire about something that has been lost." Yahyā then asked: "Tell me what it is." Abū Ya'qūb reflected for a while, and, then striking his hand (upon his thigh triumphantly) said: "It is something costly, arranged fold upon fold, white, red and green, and packed in a pouch." Yahyā thereupon said: "Right art thou. Now tell me who has lifted it." Abū Ya'qūb said: "It has been

taken away by the floor sweeper." Yahyā then asked where the pouch was. Abū Ya'qūb said it was in one of the bins. Yahyā felt relieved and ordered the gardens searched. The servants at last found the pouch at the top of one of the bins. A pouch whose value was beyond all computation was retrieved! Yahyā then addressed one of his men: "O slave! Give him 5,000 *dirhams* and tell such and such person to buy for Abū Ya'qūb a house in our vicinity." Abū Ya'qūb then said: "I shall certainly get these 5,000 *dirhams* but the house will never be bought for me."

Curious about the whole incident, Yahyā asked Abū Ya'qūb how he had arrived at the augury. Abū Ya'qūb's reply was: "Divination and augury derive from the five senses. Being blind, I press my ears into service. When I entered your house, I wished to hear something. But I heard nothing. I was led astray and concluded that it was a lost thing. When I heard nothing from anyone, I began to search the floor. I found a date flower. I said to myself that the date-tree happens to be a receptacle having white, red and green things in it, and they occur layer upon layer in the receptacle. This peculiarity is also shared by jewels tied in a pouch. Then you asked me to name the person who had lifted the pouch. Just at that moment I heard a donkey bray. I said to myself, 'The donkey is hardy and powerful and no one can have access to the wealth of the kings except for the sweeper? When you asked me to specify the place where the pouch was kept hidden, I heard someone say: "Throw it in the garden." Yahyā then asked him how he was able to foretell about the award. Abū Ya'qūb said: "When I heard you mention a sum of 5,000 *dirhams*, I heard your slaves seconding you. I felt sure I would get this sum. When you mentioned the next 5,000, I heard the slaves say, "No". He took the award 5,000 *dirhams* and went away.

Shortly afterwards the Barmecides underwent a sudden adverse turn of fortune which is now part of history.

Among the ancient and moral parables is that of a man who caught a bird in a trap. The bird asked him: "What dost thou desire from me?" The hunter said: "I shall sacrifice and eat thee." The bird said: "I would hardly suffice for thee, for I am not more than half a morsel. Wouldst thou release me if I tell thee three useful things." The hunter made the bird swear in God's Name and asked it what these three things were. The bird said, "First, do not grieve for what thou hast lost; second, do not ask for what thou cannot get; and third, do not try to verify what does not happen." The hunter said: "Verily, it is better to listen to these didactic lessons than to eat thee". The hunter released the bird which perched itself upon the opposite wall, and said, "Had thou sacrificed me and kept to thy original intent, thou wouldst have found a pearl the size

of a pigeon's egg in my gizzard." When the hunter heard this, he was overcome by greed and he began to think of cornering it. He tried to tempt the bird by offering it skinned sesame and cool water. The bird, however, said: "Thou wast neither able to sacrifice and eat me nor benefit from the things I told thee. Thou grieveest at the fact of having lost me. Thou wishest to catch me which is now impossible. I am as big as the pigeon's egg. How can a thing equal to my own size be present in me?" Then she bade the hunter adieu and flew away.

EMERALD

Zamarrud and *zabarjad* are two names of the same thing. There is no difference between the two in so far as their excellence and rarity are concerned. *Zabarjad* began to be applied to the excellent and rare kind and to both kinds also, whereas the word, *zamarrud*, became confined to the inferior kind.

Zamarrud is also written as *zamarrudh* and *zamarrad*. Its pieces are called the *qasbāt* (pipes), as they are longish and perforations are made into them for the purpose of threading. It is thus like a hollow reed or a marrowless bone or the intestines.

'Ajjāj says about the intestines:

The pipes of the abdomen in the centre of the stomach.

The poet has implied the intestines which are within the stomach. About the windpipe, the poet says:

He is cypress-statured, with a slender body, whose throat is
a stuffed reed.

According to the Rāzī brothers, best variety of emerald is the *zulmānī*. It is deep green. This is followed by the *rayhānī* and *silqī* (beet-like) varieties. All other kinds are of little value.

Nasr writes:

Greenish hue is usual among emeralds. All of its varieties are green. It comprises four varieties, *Akhdar-murr*⁹¹ is lustrous like the beet leaves, its lustre gradually increasing to attain, at first, the colour of the myrtle and later of the fresh and green barley leaf. The second variety is less lustrous than the *akhdar-murr* and is called *bahri*. Its lustre is like that of the myrtle leaf. The Chinese and the people of the coastal areas prefer it to all other varieties. The third kind is very green but has very little lustre. It is called *Maghribī*, as the people of the west like it. The fourth kind is less green than the *bahri* kind. It is called *asam*, (a hard stone) and it is the cheapest kind.

The best emerald has a pure green colour without any trace of pallor, darkness, dots, grains, signs of abrasion and white veins. Nor should its ingredients have different hues. It should, besides, have lustre.

The inner dots and grains in an emerald are impossible to remove.

Al-Kindī and Nasr write:

The characteristics of an emerald are green colour, lustre and smoothness of surface, especially if something else is placed below it. It is soft and light, being lighter in volume than all other jewels. Its colour is unstable over fire, and becomes lime instead, as its essence is light.

Abū Bakr Muhammad bin Zakariyya Rāzī states that its colour is like that of verdigris. But this can be conceded only if it is taken out of copper, not gold mines. Probably he based his idea upon vitriol, as the origin of the green colour stems from antimony.

In the Lapidary (*Kitab al-Ahjar*) it has been stated that jasper happens to be its enemy and breaks it, if it should fall upon it. It makes the stone turbid if it touches it and also abrades it.

As for al-Kindī's emphasis upon its light weight, experience has been to the contrary, as we have seen even lighter stones, as we shall mention while describing the weights of jewels with the 100 of the *ghubārī* ruby serving as the standard for the volume. The weight of emerald comes to 69½.

Emerald mines are found in Egypt at Wāhāt, Jabal Muqattam and Bajjāh. Abū Ishāq Farīsī writes:

Emerald is mined from upper Egypt on both sides of the Nile in the wilderness quite far from cities. There is no other mine of the stone on earth.

The Nile flows into Egypt from the south. Galen, in the *Kitāb al-Burhān* (The Book of Proofs or Demonstrations) has provided the proof for it through reference to the observatory at Aratastanīs. He had travelled between Aswān and the city of minarets, Alexandria. Aswān adjoins the frontiers of Upper Egypt and Nubia. There is not much distance between the bank of the Nile and the place where the Nile joins the sea in Alexandria. If both are situated at the same point from the meridian, the Nile which flows between the two would flow from the south to the north and upper Egypt would be its west on both sides, whereas Jabal-i-Muqattam would be to its east towards Ard-i-Bajjāh.

Al-Kindī writes that emerald mines are situated in Upper Egypt in its eastern towns in the region of the Sudan, behind its city, within the frontiers of Bajjāh near the gold mines between the Nile and the Red Sea in Jabal-i-Mughal in Nubia. This passage is incorrect. Bajjāh is a city of Egypt, and the area wherein it is situated is not designated as Sudan. Sudan in common parlance is that region of the Sudan to the west, from which slaves are brought. There are no mines there except those of gold. Bajjāh has both gold and emerald mines. Mughal mountains are not situated in Nubia but in the desert between the Nile and the Red Sea.

Khatībī has said that good quality emerald is found admixed with sand and taken out of wells mixed with sand in the manner of gold.

Al-Kindī states that some emeralds are mined by excavating mountain veins, while some are taken out by breaking the earth with stones.

According to the Rāzī brothers, if a prospector suspects the presence of emerald in a stone, he rubs oil over it, so that its greenish veins begin to shine.

Nasr writes:

Anyone desirous of visiting an emerald mine has to pay five *dīnārs* for every twenty nights according to the law. Sometimes the stone as well its segments are located and sometimes only clay is to be found. The latter is then washed and sifted. Clods having stones appear; they are collyrium-like. These segments are better in colour and have stones amongst them having greenish colour but inclined towards whiteness. The kind that is salt-like is the *balrī* variety. Two more colours are found in the clay. One is known as the *asam* (solid) and the other as the *Maghribī*. They are polished through abrasion. Segments found admixed with the earth are peeled occasionally to make beads. They are called *'adasayyāt*.

The Rāzī brothers state that the largest, clearest emerald, having a pleasing green colour seen by them, did not weigh beyond five *dirhams*. There is a tradition that an emerald weighing 10 *dirhams* has been seen. It was priced at fifty *dīnārs* a *dirham* and later, according to the hierarchical order, one *dīnār*.

It is rather surprising that a stone so precious should have been rated so low in value by these two authorities. Such a low value is possible only if the stone has been set on another, but even then its own value cannot diminish.

Other jewellers besides Rāzī brothers have claimed that the price of half a *mithqāl* of emerald is two thousand *dīnārs*. The price prevalent during the Marwanid period was according to the table which I have reproduced below. I have done so with all the integrity at my command. These prices do not obtain in our time.

God knows best.

Emerald (in <i>qayrats</i>)	Price (in <i>dirhams</i>)	Emerald (in <i>qayrats</i>)	Price (in <i>dirhams</i>)	Emerald (in <i>qayrats</i>)	Price (in <i>dirhams</i>)
4	2,000	10	9,000	16	16,000
5	3,500	11	10,000	17	18,700
6	5,000	12	11,500	18	21,600

7	6,000	13	13,000	19	24,700
8	7,000	14	14,000	20	28,000
9	8,000	15	15,000	21	32,000

Stories About Emerald

In the books about China it has been stated:

Sindhī *dīnārs* were the legal tender in India of ancient times. One *dīnār* was sold in lieu of three *mithqāls* of gold or even more. Emerald was brought from Egypt. It was in rings and kept in a box along with coral and jasper. Then the people of India discontinued their purchase and broke this custom.

This account does not mention the prices of the *dīnārs* of the two countries. It is quite possible that the Sindhī *dīnārs* were of pure gold and the Indian ones of adulterated gold. The ratio of 1:3 between the two is on a very high side. The Indians in their transactions in gold have a measure which they call *tola*. They do not use the *Mithqāl* measure. That *tola* measure is in the ratio of 3 *dirhams* to 7 *tolas*.

I saw an emerald cup having the shape of a pan of the weighing balance in the hands of a cup-bearer in the assembly of Māmūn Khwārizmshāh. It is said that it belonged to the Sāmānid treasury. When the wheel of their fortune underwent an adverse turn at the hands of Bughrā Khān, the Turk, it passed into the hands of Māhanāk and was sold for about a thousand *dīnārs*.

Al-Kindī avers:

Bakht Yashū' called on the Caliph Mutawwakil on Nawrūz. Mutawwakil asked him what tribute he had brought. To this Bakht Yashū' replied: "I have brought (you) a tribute which was not availed of by a Caliph or a king before you, Sir." Then he took out an emerald spoon, weighing eight *mithqāls*, and said: "My father Jibril had bled Danānir, the slave-girl of Yahya bin Khalid. When I visited her again, I saw her scooping pomegranate grains with this spoon. When the blood had been drained and the vein bandaged, she asked me to take this spoon, which I did." Mutawwakil expressed his astonishment at this and said: "By God, these people never died." Then he sent for 'Attāb, the jeweller, and asked him to determine its price. He, however, prevaricated and said he could not estimate its price.

Nasr writes that Caliph Mansūr had an emerald gem weighing two *mithqāls*. It was known as the *bahr*, since, on account of its greenish hue, it resembled the colour of the sea. Its value was 40,000 *dīnārs*. It could have been the Ismā'īlī gem which was thrown by Harūn al-Rashīd in the Tigris.

It is said that Mu'tasim took his seat with his boon companions for having wine. He extended towards them a bough which measured a cubit and enquired whether anyone was in a position to set its value. None of them could determine its value except 'Abd Allāh b. *Al-Makhlū'*.⁹² He said: "Verily, this emerald bough was bought by Umm Ja'far Zubaydah for 34,000 *dīnārs*. It had no knot in it till her death and it had at its extremity a bird made of red jacinth." On hearing this Mu'tasim ordered a search for the jewelled bird and threatened the superintendent of the treasury with death if he failed to find it. But as it was, the bird was found within the hour and it was set in the bough.

Emerald is a soft stone and cannot bear the length of a cubit unless something hard and resembling it is fixed to it, so that it is safe from wear and tear. It is possible that it might be compounded of segments and sections whose proximity and similarity might strengthen it. Nevertheless an iron wire should be made to pass through the perforations, so that the stones are kept joined to each other. An easy and apparent device to keep the emerald stones intact is to thread them together after perforation.

Khatībī writes:

Zāhir bin al-Hākīm, the ruler of Egypt, had three strange-looking pearls fixed to the folds of his turban on the occasion of the 'Id day. He had a cubit-long ferrule in his hand. It was made of emerald and was as thick as the human fingers. Instead of a handle, it had three pearls dangling. These pearls were like the pearls in his turban.

He further says:

There is an edifice made of white stones in Ikhmīm in Egypt. It is said to be the capital of the ancient Greeks. It is one of the pyramids of Upper Egypt. Its length is 54 and breadth, 34 *dhira'*. The walls on the upper side are divided off into three sections. The upper portions of the walls have the pictures of animals engraved, while the lower portions have the pictures of human beings with inscriptions underneath. No one can understand these inscriptions today.

Khatībī further avers that he had heard from an Egyptian that the middle of the arches of the building were stuffed with emeralds, and each filling was worth a cubit.

There are other fables and legends like the earlier ones. One of them is ascribed to Jayhānī in the *Kitāb al-Masālik* (The Book of Routes). In Rome there is the Church of St. Stephen, the Prince of Martyrs. Its sacrificial altar is made of emerald. It is twenty cubits long and six cubits broad. It is supported by twelve gold images, each image being two and a half cubits long and having the eyes of red jacinth. The Church has twenty-eight doors of gold and a thousand doors of jewel-like stones, to say nothing of wooden doors.

If this legend pertained to Persia, I would have said that the emerald had melted in the burnt temple. This sacrificial altar must have been made from it, although I know that emerald and fire are antagonistic to each other. As for the problem of the walls, one would presume that there would be no wall but only doors.

A similar nonsensical fable has been described in the *Dalīl al-Dunyā wa al-Ākhirah* (Guide to the World and the Hereafter). The Qāf mountain surrounds the whole world, and it is made of green emerald. The distance from its foot to the summit is eighty leagues. The greenish hue of the sky is the colour of its peaks. Devils take emerald stones from there and distribute them among the people.

May God have Mercy upon these devils! And, therefore, he writes that God has kept the numbers of the devils small, just as the number of emeralds is also small.

The people of Shamniyah describe such legends about their high mountain. It is below the North Pole and all its four sides comprise rubies of different colours. The dust-coloured ruby is said to be closer to their side and because of this the colour of the sky also appears dusty.

Story-tellers say about Dhū al-Qarnayn that when he entered the dark region of the world, the stones under the hoofs of the horses (of his army) began to crack. He, thereupon, told his friends that these stones were the stones of repentance. Anyone who picked them up would repent of his deed and he who would leave them alone, would also grieve. Some of his companions picked them up and some did not. When they came to the bright region of the world, they saw that they had picked up emeralds. Those that had picked them felt rueful that they had not picked more of them and those that had not, also regretted at not having picked them.

Precious emeralds are, therefore, associated with the *zulmāt* (darkness at the extremity of the world) and it is said that the emeralds that are in the possession of people are the same that had been picked up there. They are gaining in value as they are becoming scantier.

There is no place on earth where there is permanent darkness, unless of course there be a roof from which the entry of light has been cut off; otherwise, it is the polar regions that are the darkest. They are bright for six months and dark for the other six months. I swear upon my life that emerald is *zulmātī* but only on account of its mine.

It is impossible to mine it without the help of a lamp; and this characteristic is specific to it. However, it is a waste of time to argue about the truth or falsehood of these insubstantial claims.

There is no region on earth submerged in total darkness except the polar regions. If it is said that there are (other) regions where night reigns for months together, then such cold would be intolerable for man,

human nature being what it is.

All story-tellers are unanimous in their version that serpents lose their eyesight as soon as they see the emerald. This has been mentioned even in scholarly works, and this belief is held by the commonalty of men. We find this belief pervading poetry as well, and therefore, we hear Abū Sa'īd Ghānīmī saying:

The water of the rows of the plants is meandering through the emerald-like verdure — as if, when the snake comes before the emerald, it evades its direction from the fear that it might forfeit its sight.

Abū Nasr al-'Utbi writes in one of his treatises:

God has conferred upon everything a specific attribute and characteristic. The emerald makes the eyes of the serpent flow; the ruby is an antidote against the poisons of animals; amber draws straws.

But despite the consensus of the authorities, I found this claim to be wrong. I performed so many experiments upon this claim that it is impossible to go beyond them. I had emerald necklaces placed upon the necks of the snakes, made them walk upon emerald floors, and had emerald ropes swung before them. This I did for nine months, both in summer and winter.⁹³ All that was not done was that the emerald was not ground into a collyrium and applied to their eyes. In the event, I did not see any adverse or harmful effect upon their eyes (through the emerald).

For Allah is all sustenance and help.

Emerald-Like Stones

There are many minerals that look like the emerald. Al-Kindī writes that a section of such a stone might weigh two to three *mithqāls*. The names of these stones have been reproduced from his book, and have not been heard anywhere else.

Among such stones is *sīsan*. It comes out of the emerald mine as a green, smooth, transparent and palish stone. The difference between this stone and the emerald is based upon hardness and siccidity. Another stone is *subb*. It is like *sīsan* and it is often difficult to distinguish one from the other. Its lustre is dazzling if it is placed above the lining of a garment. A *subb* stone weighing two *mithqāls* has been seen.

Another stone allied to the emerald is the *hajar-i-Makki*. It is greenish, hard, compact and solid. Al-Kindī says that one of its kind is brought from India, and the weight of one segment of the stone has been found to be up to three *mithqāls*. Despite its hardness, it does not assume a sheen after polishing and so it can be distinguished from the emerald.

Abū Sa'īd bin Dust says:

The value of the deer comes from its musk, not from its skin. It is

the gold that is precious, not brass and tin.

The like of emerald cannot be emerald, even though both stones might have the same weight.

A stone was sent to Amīr Yamīn al-Dawlah from India. It was said that it had the colour of the emerald but not its transparency. The Sulṭān gave it to one of the jewellers, commanding him to make a cup out of it in such a way that the middle portion of the stone should remain intact. The jewellers carried out the command of the king. However, if the stone happened to be like emerald, it weighed more than half a *ratl*.

A jeweller has mentioned:

A green transparent stone was found near the agate mine in Nīshāpūr. People took it to be an emerald. Large sections came out of it, and a merchant who visited the place every year brought it and took it with him. When I rubbed it against iron, the iron became reddish, and this reddish tinge persisted for a week. From this I concluded that it was copper.

These stones or jewels are the principal elements. We have described them, their similars and appurtenances as far as we could. It now appears essential that we should describe the turquoise, as prominent people and potentates wear it and seek auguries from it.

TURQUOISE

Be it known that Jābir bin Hayyān Sūfī in his work, the *Kitāb al-Nakhab fi al-Tilsimāt* assigns to the turquoise the names, *hajar al-ghalbah*, *hajar al-'ayn* and *hajar al-jāh*. The first and the third names are by way of bibliomancy. In Persian these words mean conquest and overwhelming. In so far as the name, *hajar al-'ayn*, is concerned, the word, *sabaj*, appears to be more appropriate, as it is believed that, if anyone who is a victim to the evil eye has the *sabaj* stone, it bursts, and hence dispels the effect of the evil eye. For this reason necklaces of turquoise are made for children. People have been led to this belief because *sabaj* is very soft, and its bead is likely to break at the slightest of shocks. People began to relate this fact with the evil eye.

Nasr has to say the following about turquoise:

A bluish stone, it is harder than *lapis lazuli*. It is mined from the mountain of Sān in Khān Rūyand (Nīshāpūr). If rubbed on a rough stone after dilution with water, it will readily accept moisture. It is then oiled and filed so as to be made soft. The more humid it is, the better would it be. In course of time it gains in sharpness and colour. The best kind is mined from Azharī and Bu Sahāqī.

According to the jewellers, the best kind is hard, sharp, deep-coloured, lustrous and brilliant. This is followed by the *labanī* kind which is

known as *Shīrfām* (milky). It has also been claimed that the best variety is the *shīrfām*, followed by the *āsmānī 'aqīq* (heavenly agate). Both these kinds are the original ones: the remaining ones are their derivatives. One *dirham* by weight of the *Bū Saliāqī* kind fetches a price of ten *dīnārs*.

In 'Iraq it is the even kind that is preferred, whereas the people of Khurasan have preference for the arch-shaped and spherical turquoise, which is like a grape in form. Jewellers have been heard to say that the longest turquoise stone weighed about a hundred *dirhams*, while the pure variety without any admixture of extraneous components was not found to exceed the weight of five *dirhams*, and the price of such a piece approached one hundred *dīnārs*.

It is the self-same turquoise about which it has been said that its weight should not be taken in conjunction with the standard weight of the *ghubārī* ruby, as it has rarely been found in a pure state and not examined. One jeweller's statement is as follows:

I saw an *īlāqī* turquoise which weighed two hundred *dirhams*. I fixed its price at fifty *dīnārs* at that time. But today its price is two hundred *dīnārs*, as the mine at *īlāq* stands exhausted.

Al-Kindī writes that the largest turquoise piece which he had witnessed weighed one *awqiyah*⁹⁴ and a half a *mithqāl*. This weight comes to about 16 *dirhams*. Some people do not like the turquoise stone as its colour accepts atmospheric changes, e.g., a clear sky, a cloudy sky, winds and fragrances. Washing with hot water affects its brilliance rather adversely, while oil would take away its lustre. It is not included among the stones which are petrified by water. It is like clay and petrifies like it. If it loses its lustre on being rubbed with oil, the lost lustre is revived by fat of sheep's tail. It is, therefore, better kept by butchers, especially by those who do the skinning with their own hands. There is another mine nearby. *Shibah* stone is mined there. The mine is extensive and spoons, etc., are made from the stone. It is soft and alters with the application of oils.

It is God who prospers and assists.

Stories About the Turquoise

A member of the diplomatic mission from Ghaznah which visited the court of the ruler of Shīrāz has stated that he saw in the palace of Sulṭān al-Dawlah bin Bahā' al-Dawlah al-Daylami a large turquoise piece, the size of an apple. It was suspended in front of the curtain of the chambers.

Nasr writes:

Abū 'Alī Rustamī Kadkhudāh of Isfahān had a dinner set made of turquoise. when Murdāwīz bin Ziyād destroyed his house, this

dinner set, together with other precious articles, passed on to his brother, Washamgīr. Then it passed on to Bītūn. He kept it in the fortress of Jāshik. Later it passed into the possession of the Buwayhids.

I personally think that this would be the same dinner set about which I used to hear in Jūrjān. Shams al-Ma'ālī Qābūs bin Washamgīr had a dinner set of gold in the fortress of Jāshik before his departure for Khurāsān. It was known as *Fīrūzjī*. He was very fond of this possession. Since it is quite some time past that I heard about it, I do not recollect the quantity and other peculiarities of *Fīrūzjī*.

Nasr has further written:

Amīr Radī Nūh bin Mansūr had a wine goblet made of turquoise. It could contain up to three *ratls* of wine. This cup was given to a jeweller who had been specifically called from 'Irāq to rub and polish it. The cup, however, was broken in the process and the jeweller had to flee in fear of his life.

Abu Bakr Al-Khwārizmī says:

I remembered thee, even though the stars twinkled like pearls scattered on a turquoise floor. They shone under the mantle of clouds like sparks glittering in the smoke of the *'arfaj* plant.

Mansūr Qādī states:

Thy slave has brought *dīnārs* and *dirhams* as tributes, and they are of exalted quality. Could thy slave do what he wished, he would have brought heaps of them.

He has presented thee a superb turquoise ring for good augury. See (for thyself) that it portends good. Think not of the smallness of the numbers.

Chalcedony

This stone comprises variegated colours—from pale white to yellow, red and nearly black. Its mines are in Sindh and around the villages of Muqrī and Na'am in the Yemen. Nasr has described a third mine at *Qasr Qasas* better known as Sakhrah. In the Lapidary it has been said that it is fetched from Rome and the West.

Al-Kindī says that the Indian variety is brought from Barūs celebrated for its Barūsī javelins. Pills called *jafāhiq*, are made from it.

I am inclined to believe that the name of the city would be Bharūch, and it is situated in between the place where the river Mehran (Indus) falls into the sea, and the inland sea of Serāndīb where the sea-pirates near the coast have their lairs.

Al-Kindī (further) says that whatever quantity of chalcedony is picked it is spread over cow's dung and heated in an oven. Fire in a specified quantity is lighted, and the stone is taken out on cooling.

The people of Yemen also follow a similar procedure. They warm the stone under bright sunlight and then place it in the camel's dung. It is then heated. Fire has the property of making chalcedony contract but whatever remains is of high quality. It would be spoilt if thrown into fire again, and becomes like a charred bone. All inscriptions upon it are made by sal ammoniac and borax. When brought close to the fire, the inscription becomes white. Chalcedony is found upon a stone which is brilliant like beryl and has white and black markings upon it. This stone is called *asīm*.

After being taken off the oven, it is placed upon an iron (plate) which is firmly fixed to the ground. It is then gently ground till the pieces as desired separate. There are no mines of the stone except for those in India and Yemen. The chalcedony known as *Rūmiyā* is associated with Rome as the people of Rome like it. There is no mine of the stone in Rome. Its association with Rome is like the association of a thing with a city where that particular article is brought and then exported to the other countries.

Nasr says that the Yemenite variety has a pale gold colour with brilliance in it and its colour and pellucidity are even. Such a variety is known as *mudhahab*. It has bright edges.

There is a kind of chalcedony which is reddish yellow and is humid and lustrous. This is the *Rūmī* variety as the people of Rome like it. The kind that is more reddish than yellow as *'aqīq-i-ahmar*. It is hard and costly. The cost of its gem could reach three *dīnārs* or even more. The people of 'Irāq, however, have preference for the varieties having the colours of dates and apricots. On the other hand, the people of Khurāsān prefer the varieties having the hues of the tamarind and the liver. With the *ghubārī* ruby assumed as the standard of weight (= 100) by us, it would weigh 64¾. It is said that a piece of chalcedony weighing 20 *ratls* was found.

One person told me that he had seen a big chalcedony piece among the nobles of Yemen. It would seem, from what he has described, that the stone must have been even bigger. The colours that are desirable in chalcedony should be free from blemishes, should be without veins and stripes, cloudiness, darkness, whiteness, variegation and free from contradiction in colour and pellucidity.

It is said that the best chalcedony is very red with something like stripes on its face. Nasr says that, among the chalcedony mines in India, there is a chalcedony with black and white colours intermingling. This variety is called the *jazā 'baqrānī*. Its price is less than that of the real *baqrānī* kind.

Stories About Chalcedony

It is said that the idol, Hubal, which was in the Ka'aba during the Jāhiliyah period was made of chalcedony. Its right hand was broken, and the Arabs had a gold hand fixed on it. This appears rather surprising as the people of India do not like idols which show signs of breakage or markings due to friction or abrasion. In fact, they remove them. How, then, could the people of Makka offer respects to an idol that had its right hand lopped off?

Many persons do not like 'aqīq (chalcedony), since *a'qūq* means disobedience. They say that there has been a mistranscription in the *hadīth*, *Takhtemu bi al-'aqīq* (put the seal of chalcedony). According to them, what the Holy Prophet had said was *Takhayemu bi al-'aqīq*, i.e. put your tents in the valley of 'Aqīq. It so happens that people do commit orthographical mistakes and make wrong transcriptions. In the Tradition, the Holy Prophet is said to have directed that the *hasa al-jimār*, that is, the stones with which the pilgrims pelt Satan, should be washed. An idiotic scholar of Tradition wrote this as *Khusa al-himār*, which means that the testicles of the donkey should be washed. When his pupil asked him about this, he said: "Son, this was said in all humility". Probably he had in mind the incident of the Prophet Jesus' having washed the feet of his disciples.

From Allah is all sustenance and help.

IN THE DESCRIPTION OF JAZA

This stone is harder than the stones similar to it. It is because of its hardness that it is employed as a conduit in water dials. A hole is bored into the conduit made of it which is fixed into a box, the lower portion of which is coated with some resinous material. It is selected for this purpose as the constant flow of water does not widen its perforation for if the orifice of the water-dial widens, the flow of the water would vary and time will not be determined.

Having the standard weight which we have fixed in view, its weight is $63\frac{1}{8}$. It is taken out of chalcedony mines in Yaman. Some persons believe that *jaza'* and chalcedony are allied in that they are found in proximity to each other.

It is said that the stone found close to chalcedony in India is *jaza'*. It comprises several varieties. The *Baqrānī* kind is the more famous. Its striations are straight and it comprises sections (arranged) over each other. The even-ness of the sections, layers and their surfaces attest to its even-ness.

It has three colours. The surface is red and coral-like with transparent whiteness and a crystalline colour above it. Some grains of the

stone are absolutely black, and, if a stone happens to be emerald-like in colour or yellowish, it is studded upon the surface of a jewel. All these characteristics are innate, not artificial. If the upper or lower portion of the stone is broader than the middle part, it is rubbed till an even surface is achieved. Its beauty is inherent in its olivine and white hues and its novelty lies in its greenness. It is but rare that it should have any other colour except these three colours. The choicest stone is even, variegated and brilliant.

According to Hamzah, it is called *khalanj* (piebald) in Persian and the *baqrānī* is known as *fakirī halanj*. The word, *khalanj*, is not specific to *jaza'* but to everything that is bi-coloured or piebald, e.g. cats, foxes, onagers, etc. In fact, even the wood that is bi-coloured is also called *khalanj*. In Turkistān, cups, dinner sets, water basins and articles of the same ilk are made from it. At times these markings become very narrow like those of the *Khutū*. Should it be pleasing to the eye, hasps of knives and scimitars are also made of it. It is brought by the Bulgarians.

One kind of *jaza'* is associated with Irān, since the Persians like it. Although like the *Baqrānī* kind, it is the opposite of the *Baqrānī* kind which is superior. Its sections are thick and its lines thicker and less even. Some Irānians prefer the kind which is slenderer in the middle. The *Habashī* kind is next to the *Fārisī* variety. It has no red section and has black lines on the sides with white colour in between. For this reason it has been associated with Ethiopia (Habashah) as the white teeth of the Ethiopians glitter in the midst of their scanty beards. Another kind is the *Basīlī*. The upper and the lower sections of this variety are reddish-black and whitish and, because of this distinct coloration, both sections appear distinct.

Nasr says that it is cooked in oil till its veins or stripes become firmer. According to Al-Kindī, its mines are not distant from those of the chalcedony. Every kind, he says, is cooked in honey for a day or two till its veins open up.

If this is so, it is what has been stated in the *Kitāb al-Kīmiyā'*, namely, that some stones grow, some contract, some divide into pieces and some change colour, e.g. *Jaza'*, underneath, the earth.

The *Gharwānī* kind of *jaza'* bears an intricate colour pattern. Its sections are large. I have seen large pieces of it from which utensils are made. A tapering crock, which Al-Kindī mentions, could contain more than 30 *ratls* of water.

Nasr has mentioned the *Mu'raq* instead of the *Gharwānī* variety. It could be perhaps superior to the *Gharwānī* kind, or both might be identical unless, of course, the name, *Mu'raq*, follows from an excess of perspiration. When its sections are mentioned, it is the quantity and not the colour that is taken into account.

Nasr further writes that it is this kind which is usually possessed by people. Its veins are variegated in colour and slender like hair. They are black, red and white, and at times present the pictures of animals and plants. (Jewellers have also been reported to have made similar statements. Al-Kindī might have based his description upon the statements made by jewellers, and he had made an observation to this effect as well). These pictures come into being through the intermingling of different colours. Although the basic material of all these colours is the same, the central portion of each colour is different, as if they have been woven together layer upon layer. Again, the *Baqrānī* kind, unlike the *Fārisī* and *Habashī* varieties, is compact and long. Therefore, different forms and shapes manifest themselves in it, and accidental abrasions and breakages give rise to strange and unexpected forms.

The Lapidary states:

There is a mine of this stone in China. People do not go near it because of its evil omens. Only those seized with anxiety and melancholia take it out of the mine and transport it to other countries. It is the belief of the Chinese people that, if put on, it spells grief and sorrow. If suspended from the neck of the children, it acts as a constant sialagogue. If water is drunk from cups made from it, sleeplessness results. The kings of Yemen also abstained from it, as it spelled an evil omen.

As far as the evil omen is concerned, it is the lexicographers who are responsible for it. As regards the other characteristics, they relate to the properties of *jaza'* and can be proved true or false only after experimentation.

Stories About *Jaza'*

The statement that the mine of *jaza'* is in China is unconfirmed and occurs in an apocryphal work.⁹⁵ So far as seeking evil omens from a thing are concerned, there is no ground for surprise here. If what has been stated about the kings of the Yemen is true, Marqash would not have included *jaza'* among the articles of jewellery and self-decoration.

He says:

These women adorned themselves with ruby, beads, tinctures, the Zifarian *jaza'* and twin pearls.

Abd Allāh bin Qays al-Ruqayyāt says:

O thou mother of the wearer of shells necklaces, glass beads and *jaza'*, greetings to thee!

Another poet says:

Night is walking on the pebbles of the Zifarian *jaza'*.

Both Marqash and the other poet evoked the image of the Yemenite *jaza'* and both have alluded to Zifār which is a town in the Yemen and where

the kings of that country used to stay. Once a person came to visit the king of Yemen. He was standing at an elevated spot and the King asked him in the Himyarite tongue to take his seat. The King had said, *Thib*, which means, "Take thine seat". But he thought he was being commanded to jump, and he jumped to death. (In Arabic *thib* and *wuthīb* are the tenses of the verb infinitive for jumping). This is how the adage, *man dakhala Zifār hammara* (He who enters *Zifār* must speak the Himyarite language) has originated. In fact, it would be better still if the adage ran as follows: "Anyone who becomes the king of Zifar should adopt diversion and accost everyone according to the circumstance". A Himyarite king happened to be a cripple and lay all the time on bed. People, therefore, used to call him *mawthabān* which is derived from the same word, *wathaba*.

It has been said about *tau'am* that it means an even number yielding an even quotient when divided by an even number, i.e., two and two, since pearls look charming in pairs. It is also quite presumable that *tau'am* means uniformity and that the major and minor units might not be equal under all circumstances but almost similar to each other. When the first and the second pearls are equal, and the second is equal to the third, then the first would be equal to the third, and this series would go *ad infinitum*. If the kings of Yemen took *jaza'* to spell an evil omen, this idea would have gained a firmer root among the people and they would have followed their rulers. But, on the contrary, we see them praising *jaza'*, not refraining from describing it, and not referring to any evil omen in conjunction with it. Imr al-Qays who is himself a decendent of the Kindah Rulers (of Yemen) says:

As if the eyes of the onagers scattered round our tents and accoutrements look like unperforated *jaza'* (*lam yuthqab*).

At the time of death the eyes of the onager and other animals become akin to *jaza'* except for the fact that their eyes are without perforation, as the white of the eye which surrounds the pupil becomes all the more evident and the eyes are holeless. Some exegetes have said that the *jaza'* stones that are threaded are of the inferior kind and cannot be threaded without being bored. The poet has, therefore, especially mentioned the unbored *jaza'* from which the gems of the ring are made and which are of the best kind. The poet has, therefore, alluded to the better of the two varieties.

Another meaning that might be ascribed to the verse could be that the eyes of the dead animals are like the unthreaded *jaza'* stones and because they are unbored, they lie scattered.

Abū Ahmad Askarī writes:

The beauty of a poem lies in the poet's conveyance of the purport at the end of the distich and, when he reaches the end, he should add to

the verse, charm and significance, as Imr' al-Qays has achieved in *lam yuthqab*, so the poet has already alluded to clean and transparent *jaza'*. With *lam yuthqab*, the poet has achieved a more telling effect.

Imr al-Qays says:

A person bringing joyful tidings said: "Mayst thou have the best of victuals." I have seen three onagers grazing separately in the wilderness as if they were unthreaded *jaza'* stones.

A poet has depicted the pupil of the eye (*sawād*) circumscribed by the white (*bayād*) as follows:

Our female singer gazes with such eyes as if two round *jaza'* stones have been superimposed upon two pearls.

This poet has compared the fierceness of the eyes with two pearls, the pupils of the eye with the blackness of *jaza'* and the whites of the eyes with the whiteness of *jaza'*. Sanawbari, flattering his beloved, says:

Jaza', ruby and pearls — these are thine two eyes, two cheeks and teeth.

Labīd says about his brother, Arbad:

He was our leader and our thread and the *jaza'* that guarded the thread.

Farazdaq says:

Such goats are our hereditary wealth and are like the *jaza'* stones that hang from the breast bones.

And Imr' al-Qays says:

When they turned their backs (upon us), they presented the spectacle of the *jaza'* necklace which had been put on by one of a noble tribe.

That is to say, the *jaza'* necklace was put on the neck of a child belonging to a noble tribe (even though the child might be an orphan) and inherited wealth. And the necklace had besides *jaza'*, other kinds of stones strung on the necklace for achieving proper spacing. The implication, then, is that the kids of the goats in the herd looked like the stones of another species threaded into a *jaza'* necklace.

ʿAbd ʿAmr Tāʾī says:

They turned their backs upon us as if they were a *jaza'* neckband round the throat of a slave.

Abū al-Tamhān writes:

Their high pedigree and countenance dispelled the darkness of the night so much that *jaza'* could be threaded in the light (of their countenance).

Exegetes have attempted to explain the image of *jaza'* by saying that the stone is speckled by white and black stripes which are arranged close to each other. The whiteness of its stripes and the day make it invisible, and the whiteness of the stripes and the night also make it equally invisible. But this is an explanation that *jaza'* would be invisible both in

the day and night, although it is visible in the day. So why emphasise this point? What the poet, in reality, wishes to say is, that it is very difficult or impossible to stitch *jaza'* at night, but this difficulty is overcome when the moon is gibbous. A hemistich by an Arab poet, *Fi laylat saba' nāzim jaza'* (the threader of *jaza'* on the seventh night) attests to this explanation. This would show that it would be easier to perform the threading when the power of light is greater.

We have already narrated the story of the hare. I had a *jaza'* board having a smooth surface and crooked stripes. It had the picture of a duck without legs and it looked as if it was either swimming or hatching its eggs. It was so clearly drawn that anyone who saw it could swear that it had been limned by an expert artist.

One Khwārizmi artisan told me that he had a *jaza'* shell back-bone. It had, he said, a white ground but all colours were to be found in it. The sculptor had the black stripes of the stone transformed into the hair of the head and the eyebrows. The red stripe was made into the lips and in this way all the parts of the body were delineated. I have only heard this and not seen it with my own eyes. It is not the art of the sculptor that amazes me but the fact that a shell should have all these attributes. The same thing is said about *shabdāz*, although I have not verified this.

The *jaza'* stone in the Ka'aba is known as *Habashī*, although it is celebrated as *Yamanī*. It is black with white stripes running through it. Spherical, its diameter is one span long. It is studded, three spans above the floor, on the wall opposite the gate. This stone was acquired by a person by the name of Nu'mān from the coast of an island which had several *farsangs* of a pasture having fields, dates, orchards and a vast hunting ground. In fact, it had all the qualities that such an island ought to have. When Walīd bin 'Abd al-Malik heard about this island, he despatched Nu'mān there. Nu'mān demanded a very high price for this *jaza'* piece.

It is said that its price was in excess of a thousand *dīnārs*. But Nu'mān did not agree to any price except that the island should be granted to him. Walīd at last agreed to grant it to him and the *jaza'* was sent to the Ka'aba. This island remained in the possession of Nu'mān and then of his descendants. Its port became known as Marsā Nu'mān.

It is said that Sa'īd bin Hāmid presented a dining set to Māmūn al-Rashid on a Nawrūz day. It had a gold bodkin the diameter of the stone. The card accompanying the present stated: "I have presented your Majesty with a dining set which is *mīl* with *mīl*". Māmūn took the purport to be the *mīl*, i.e., one third of a *farsang*. But when he saw the dinner set, he was very pleased, and enjoyed the pun upon the word, *mīl*.⁹⁶

A friend of mine has told me that he had seen the clasp of a knife

which was as broad as one and a half finger. It had two colours running exactly in its centre. Half of it was *jaza' baqrāni* while the other half was transparently green. It looked like emerald, but it was harder and gave off sparks.

Ismā'il bin Ibrāhīm says that a stone found in Tibet is exported to China. It is akin to *jaza'*, but it is not *jaza'*. It has very pleasing colours and has strange and intricate patterns running through it. It is very costly and is employed in waist bands and in the collars of the cattle.

All sustenance and help is from Allah.

BERYL, CRYSTAL AND ROCK CRYSTAL

The beryl stone which is called *mahā* and *mihā* is said to have its origin in *mā'* (lustre, water). Because of its limpidity and resemblance to the transparency of water, it began to be called *mahā*. The word, *mā'* is said to have its origin in *mawh*, as its double collective nouns are *miyah* and *amwāh*: *mawhatu al-shay'*, is also derived from the same usage, and is spoken of in connexion with a thing which is endowed with a lustre which it previously did not have. This word is also employed when something is inundated with water or made brilliant or sharp. Thus we have Imr' al-Qays saying:

The young bird ready to take off was given a feather, and then it was whetted (*amhāhu*) on the stone.

Some lexicographers have claimed that the word, *mahā*, is a compound of the words, *mā'* (water) and *hawā'* (atmosphere, ether), both being the essences of life. It is also colourless like both. Thus Buhtarī says:

Her colour has masked the colour of the wine-cup and in the cup she appears as if she is standing without it.

Sāhib (bin 'Abbad) says:

The wine-cup and the liquid ruby both are transparent. Both have become similar and identical.

Abū al-Fadl Shukrī says:

Wine upon wine seems like a lamp which has had a surfeit of the rays of light and flaming. And the gazer (overcome) by this union of the cup and the wine would think that (the cup bearer) has no cup.

Ibn al-Mu'tazz says:

She is a tormentor – the pale Karkhian. She seems to be throwing her own flames in the cup. It would seem that it is not wine but a flowing cup, and the cup looks like congealed water.

Another poet says:

The ray of the sun has been imprisoned in the cup as wine, and so delightful is it that this illusion appears.

If one gives it, the delight would not allow it to be found whether

the wine is without the cup or the cup without the wine.

Mahw is a white stone, also called *busāq al-qamar* and *burrāq al-qamar*. In Roman it is called *afrūsālīnūs*, which means the froth of the moon. The moon is *sālīnī* in Roman.⁹⁷ Dioscorides has also given a similar description. He writes:

This stone when the moon is in the ascendant appears white and transparent and, if the moon is on the wane, shines like fire but it does not shine in the day-time.

Amīr Shahīd Mas'ūd had given me some rarities as gifts. Among them was a stone the size of a lentil and which seemed to have become compounded of black gravel. I was told that this stone was found near Ghaznah, close to the fortress of Nā'in. It is visible on the nights, the earlier part of which is dark, i.e., towards the end of the last fortnight of the month. One of the Hindus appointed to that fortress confirmed this fact and told me that the Hindus in the eastern region transport the stone to their temples. On persistent enquiries by me it was also revealed that this stone is employed for chemical purposes. In India the moon-stone is known to all the sundry, as we have already described. But this stone is not that which has been mentioned by Yahyā Nahwī, and which is inclined towards the colour of the dervish's garments. This is in the centre and the whiteness follows the waxing and waning of the moon. It is hidden during the waning period and asserts itself on the third day.

Some people say that moonstone is *jaza'* and that its whiteness is enhanced by the brightness of the moon. It is, therefore, associated with the moon. In any case, the characteristics of this stone and those of similar stones can be established through further observation. However, this stone is not the one described by Yahyā.

Crystal is among those excellent stones from which vessels are made but, being plentifully available, it has become less esteemed. The people of India call it *patak*. It is quite hard and can be employed for cutting jewels. It is for them what steel is for iron. If its sections are rubbed against each other, they give off sparks. It is regarded noble because of its transparency and clarity, and also because it is like the essential elements of life, i.e., air and water. God has said:

White, delicious to the drinkers⁹⁸

Wherein there is no headache nor are they made mad thereby.⁹⁹ Wine, because of its after-effects, becomes revolting. But, if there is no harm in it for the present and no inebriation at the end, it can become acceptable to the temperament. Whiteness is a characteristic of the cup, not of the wine, since in wine whiteness is not desirable. The whiteness signified here is freedom from all kinds of hues, just as the white crystal and pure milk are devoid of all colours. White and black are contradictory to each other and are not characterised by transparency. It is quite

possible that the bearers of colours that range between the white mound and the jackdaw could be transparent, while at the same time the possibility of opacity cannot be ruled out, if there is blue or earthen colour present. Because of this, the Arabs compare the purest white colour to silver. Here it is not transparency that is implied, as silver is not transparent, and therefore God has said:

(Bright as glass) but (made) of silver which they (themselves) have measured to the measure of their deeds.¹⁰⁰

Since the Qur'ān was first addressed to the Arabs, they were instructed according to their customs and traditions. One example is the image of the honeybees which is in accordance with the observations of the Arabs about them. They saw the honeybees sucking the juices of flowers and there were no other passages except for those above and below. They, therefore, thought that honey was their food which they expelled from both their openings. Therefore, a poet (Tirmāh) says:

What (the bee) collects in the honeycomb she makes into honey-dew and honey. She stores and guards it.

And therefore, the Qur'ān says that the honey-dew comes out of their stomachs, since the stomach is closer and its mouth serves as the womb, although the bee sucks something like alcohol (nectar) from the flowers through its proboscis in the direction of its legs, transports it to the honey-comb, and stores it there for its offspring, so that she might have food stored even when there are no flowers or fruit. That which comes out of the lower orifice has the foulest smell in the world, but which she, being inclined towards cleanliness and purity, utilizes in guarding the combs, especially as she is excessively fond of fragrant and delicious things.

As far as the axis of the crystal is concerned, it has the same weight as *jaza'*, and not to the contrary. It is brought from the island of Zanj and other islands to Basrah, where vessels are made. Large and small pieces are collected at one place. Instructions are tagged upon pieces that are to be cut and shaped and the types of vessels that are to be made from them. They are then handed over to the artisans who follow the instructions and collect high wages. These wages are far higher than those of the persons who measure the pieces and put down the instructions. There is considerable difference between knowledge and the practice of that knowledge. This crystal possesses the tenuity of the air and the transparency of water. If a hole, knot, or cloudiness tells upon its transparency, it is masked by some etched design or inscription, requiring considerable expertise. Should this defect engulf the whole piece and remove its transparency, it is denoted as *rim billūr* (the dross of the crystal).

It is brought from Kashmir also. Some sections are uncut and some

are used in the making of vessels and utensils, goblets and cups, chess pieces and counters, and pieces as large as the soap-nut. But this variety does not approach the Zanjī kind nor is the quality of the workmanship of these people (i.e., of Kashmīr) as finished as that of the Basrans. Its sections are found in mountains as well. It is found in plenty in Wakhān and Badakhshān but is not exported.

Al-Kindī writes:

The best crystal is the A'rābī which is picked from the desert among the gravel. It is found encapsulated in a thin turbid sheath and weighs up to two *ratls*. It is similarly picked from Serandīb, but it is less transparent than the A'rābī.

Some crystals are excavated from the earth, and the one mined from Arabia is good. Al-Kindī says he had seen a piece that weighed more than 200 *ratls* but it was cloudy for the most part and had perforations. There is a crystal mine in the frontiers of Armenia and Badlīs, and the colour of the crystal mined from there is pale.

Nasr has classified the crystal into four kinds. He has mentioned all the characteristics of the A'rābī kinds enumerated by Al-Kindī. But he has added the observation that when sunlight impinges upon it, it presents the colours of the rainbow.¹⁰¹ Nasr ought to have said that such crystals are broken, as the pieces that are intact do not reflect the colours of the rainbow. The reason is that it is like pieces of ice and such colours are visible in the pieces too. The second kind is the *ghaymī*, so called by way of similitude, as *ghaym* means the cloud. The third kind — the *Serandībī* — is nearest to A'rābī in the attributes but not in transparency. The fourth kind which is mined is better than the A'rābī. Nasr gives another kind which has caught the odour of smoke and fire. This kind is the most inferior.

In the Lapidary it has been stated:

Crystal is a kind of glass which is found in glass mines in the form of a congealed body. If glass is found in a dispersed state, it is collected by means of magnesia.

Some authors, following upon the heels of Nasr, have written in their books that the crystal is a glass-like mineral, whereas glass is an artificial variety of crystal.

Hamzah says that crystal in some ways resembles glass but is not made from it. This is possibly so because both are transparent and whatever is inside them is visible. But as regards melting they are distinctly different as, while glass melts, crystal does not, as we shall discuss later. But I have neither observed this nor tested it.

Some authors have said that crystal is congealed water. This is what I also say as I shall elaborate later. Since it is like limpid water, it has been compared to hydrated stone and water bubbles. Ibn al-Mu'tazz

says:

The water bubble appearing like the crystal ball inverting.

Awfi says:

When the drops fall upon its waters, then bubbles rise up wherever the drops fall. It seems as if they are the vaults of pearls round which girls are fluttering sheets.

If the pearl had a bubble, it would not be transparent and nothing inside or outside would be visible. It is, therefore, more artistic and poetic to compare a spark with the crystal. Abū al-Hasan Mawsilī says:

Bubbles of water in it at daybreak seem like reeling crystal goblets.

And further:

Spherical drops of rain pattering upon water are like bubbles upon the face of glass.

The production of different forms of crystal in a natural manner would be surprising. The carver whom I have already referred to told me that he had seen within the environs of the ruby mine at Warzfanj, draughts used in backgammon and hexagonal and octagonal chess pieces among the gravel-stones. They seemed so well turned out that it was unbelievable that they had not been carved by an artist. Sanawbarī says about a pool:

Clouds are threading pearls upon it as if a threader is stitching them together with meticulous care.

Some seem like the hexagonal pieces that are arrayed like a legion on the chess-board.

Chess pieces are hexagonal and those of backgammon spherical. They are marshalled in the corner of the board and, if they come in the centre, they spell luck.

Stories About Crystals

In the *Kitāb al-Ghashb* (The Book of Injustice) Aflūtarakhas¹⁰² writes that Ayarun, the Emperor of Rome, was presented a wonderful and extremely precious hexagonal piece. He has not specified whether it was a single piece or many pieces which would be joined together while being placed on the chessboard. The Emperor was mightily pleased with the gift and asked a philosopher who was present at the assembly what he thought of it. The philosopher replied: "I see nothing good about it, for, if it is lost and you are not able to get the like of it, you will be dependent upon it. On the other hand, if it undergoes any harm, you will be correspondingly grieved." What the philosopher had foretold happened. The Emperor had gone on a visit to the islands in the spring and he kept the piece in one of the boats. This boat which was attached to the Emperor's boat as the lead-boat capsized along with the piece when a storm blew. The Emperor was disconsolate for a while, but his grief was

assuaged when he recalled what the philosopher had said. Those who have read the story of the ring known as the *Isma'īlī*, would wonder why *Ayārūn* was unable to have the crystal piece brought out of the water, although he had at his beck and command expert engineers and men of craft called *makhāniqūnāt*.

Manālāus has written a book upon the weights of unknown bodies and has described how their weights can be determined without separating them from the adulterant. He has written that *Ayārūn*, the king of Sicily and Rome, was presented a crown that was studded with jewels and made with great craft. He wanted to have it weighed, but he did not wish that it should undergo any change for the worse. *Ārshīmīdas* was able to determine how much gold it contained and how much of it was adulterated. *Ārshīmīdas* is the same person who had the ships of the invaders of an island of Barbar burnt. The same thing has been said about an island of Persia.

Alexander saved himself from the shock which *Ayārūn* had sustained. He was presented a set of beautiful crystal vessels. He expressed his appreciation for them and then ordered that they should be dashed to pieces. When he was asked why he gave this command, he said: "I knew that each of them would break at the hands of the servants and every-time I would be furious. I, therefore, chose to sustain grief only once and saved myself from the sorrow which I would have felt on each occasion and the servants from the whip of my fury."

Probably a similar idea passed through the mind of 'Abbādī. He was driving an ass laden with wine goblets. Someone asked him what it contained. 'Abbādī replied: "If the ass trips over, there will be nothing."

Ya'qūb bin Layth went a step ahead and said something even better. He attacked *Nīshāpūr* and having had *Muhammad bin Tāhir*, the ruler of *Khurāsān*, arrested sans his trousers, he made the latter make a round of his treasures, asking for the details of each item. He told *Ya'qūb* about each item till they both reached the room where rare pieces were kept. *Muhammad* told *Ya'qūb* the cost of crystal vessels and uncut quartz pieces. *Ya'qūb* ordered all these pieces to be broken and then sent for his own cup, from which he quaffed water. It was made of *isped-rūyah* (brass) and was as thick as the little finger of the hand. Having drunk his drink of water, he dashed it to the ground. The cup clanged and rolled. Then he addressed *Muhammad bin Tāhir* as follows: "O son of an adulteress! What didst thou gain by lavishing money on all these vessels? I have drunk water without them. Had thou not better collect people through thy wealth, people who could stave me off?" He had *Muhammad* imprisoned in a trunk and took him to 'Irāq where he kept him till he was finally defeated by *Muwaffaq*, the 'Abbāsīd.

When we consider the character of *Ya'qūb bin Layth*, we find that

fortune, wealth and energy characterised his reign. The character of his brother makes these characteristics of Ya'qūb all the more obvious. When 'Amr ascended the throne, he sent one of his confidants to Baghdād with a considerable sum of money to buy crystal vessels. This person had heard what had transpired between Ya'qūb and Muhammad. He did not feel like spending gold upon crystal cups, vessels, basins and jars. He instead had gold cups, basins, and jars cast and presented them to 'Amr. 'Amr felt offended on having had his command violated. He, therefore, ordered the man to be given wine in one of the cups brought by him (from Baghdād) as was done in offering esteem. The cup-bearer was commanded, at the same time, to put a live poisonous snake at the bottom of the cup. Such a snake has the habit of jumping to bite. The snake bit the confidant on the tip of the nose, and he died there and then. 'Amr's reign was not prosperous like that of Ya'qūb's and was on the decline. But wealth and adversity had shown him the way to waste his wealth. When he was being taken to Baghdād as a captive, he passed a bridge in Khurāsān. 'Amr began to laugh inordinately. One of his fellow-prisoners enquired from him the reason for this outburst. 'Amr replied:

I have passed through this bridge thrice. Once I was crossing it with my ass laden with brass. The ass tripped, and I could not lift it alone. The fall of the ass impeded the path for the others. No one passed this way and I could not request anyone's help, and the day was about to end. Next time I crossed this bridge with fifty thousand horse-riders. And now that I am traversing it the third time, we are sitting in a canopied litter. I wish to be restored to the first state. We beg the Assistance of God.

I had a crystal ball which housed an Indian spikenard. Some of its rhizome fibres had detached themselves and had dispersed in it. I had another similar ball of crystal. It housed green leaves which still retained their original state, just as the spikenard (rhizome) had kept its dusty colour.

Quite obviously these things were found in the crystal when it was torrential and had greater tenuity and finer essence than pure water. Were this not so, these things could not have been submerged into it, as they float upon water because of their lightness. It is quite probable too that the flowing crystal wafted these things (like water) and then became transformed suddenly into crystal. God has far greater knowledge. What do we know of these things?

A person who saw crystal-cutters in Basrah says that they find that crystal pieces have grass, wood, gravel, earth and air-bubbles in them. All this testifies to the fact that the crystal in its pristine state was a liquid in motion. This should not come as a surprise as we find things in

certain places that have petrified, and when a plant or animal can become converted into stone, it is not strange for earth or water to be petrified, and if people did not see these occurrences often, they could not have become known to the commonalty of mankind.

Tirmmah says:

Our sovereignty continues from the ages when the solid stones were watery and the rocks were soft.

*Ajjāj says:

This was in the days of the Flood, although the stones were like bole.

Another poet says:

The stones were wet on that day, and Acacias and thorny species of Acacias were lying cut up.

CORAL (*BUSSAD*)

People believe *bussad* to be *marjan* and in the books on medicine this has been so held, as we have said.

Lexicographers and the ancient poets are united in the belief that *marjāns* are small pearls. We have already said that God's statement, "(In beauty) like the jaycynth and the coral stone" has been interpreted to imply the transparency of ruby (Jaycynth) and the whiteness of the coral. Here, however, clarity is implied for sparkle, not transparency, since, if it is transparency that is implied, what else would man see except ugly and horrifying things? "Jaycynth" here signifies the roseate colour of the skin which is esteemed. The redness of *bussad* is also not unlikely, as it is essential for the cheeks of women. It is, therefore, not something improbable to take *marjan* to be *bussad* here, provided we ignore the lexicographers here.

Bussad is a plant of the Bahr-i-Ifranjah, which is the sea around Syria and Rome when it adjoins the frontiers of Ifranjiya.

Muhammad bin Zakariyyah says that its tree grows so tall that it tears apart boats. Ibn Zakariyyah's statement would show that it becomes petrified in the sea, but what Dioscorides says is the opposite of this. He says *bussad* is an internal plant of the sea, but when it is taken out of the sea and comes in contact with air, it hardens.¹⁰³

Some have said that it comes white and soft out of the ocean. It is then interred in the sand¹⁰⁴ when it becomes hard and red. Its hardness and red colour are in proportion to its ripeness. It is quite possible that its redness is temporary as fire removes it, especially if it is persistently heated.

The author of the *Kitāb-i-Thurayyā* writes that *bussad* and other jewels like it are physically like plants and with respect to their nature belong to the plant kingdom.

There is no doubt that marine plants at the time of growth are soft, and therefore, like terrestrial plants in the nature of their growth. When they harden and petrify, they become akin to minerals because of the petrification of their bodies. I have seen many a body, besides *bussad*, which must have been soft before petrification. For example, marine crabs, having been taken out of the sea, become petrified. As for the sponge, it is also like minerals and, like minerals, lies at one place. It is very much like plants as far as its growth is concerned. In fact, it may be said that it is like animals, because it is said that it contracts on touching when it is attached to its stone. We cannot say this about the nacreous shell, since it is an animal, as it walks in the depth of the ocean, touches things, and eats. It is, however, because of its shell, like minerals, but the shell is its guard, just as the shell of the snail guards it and lies wrapped round it, although the snail crawls. Or take the case of the tortoise which is safe within its carapace. The same is true of the scales of the gavials. We have seen many other animals which are shielded by lithic coverings, but they cannot be said to resemble minerals.

The author of the Lapidary says that the *marjān* is the essence and the *bussad* is its derivative. This is according to the statement that *marjān* and *bussad* are one and the same thing except for the fact that *marjān* is a slender perforated root and *bussad* is its branch like that of a tree in the sea.

This root actually comprises slender pipes enclosed in a shell through which even a needle cannot pass. There are several layers of the same kind upon it, and, instead of cutting these hollows, join and support them. They are like the knots of the phragmites plant. All of them are reddish like *bussad* and do not bear different shapes either. Hamzah writes (about the origin of the word, *bussad*): "This word was, in reality, *wusad* which has been Arabicised to *bussad*." There is another variety of *bussad*. It is called *khurūhak* which has been transmogrified to *khurāhak* in Arabic. The root of the *bussad* is so called when compared to the comb of the cock. Shrivelled and broad anemones are, in the same way, called *khūl Khurūh* (i.e. a small cock, or small birds – *murghān*).

Therefore, I tend to believe that the word, *marjān*, is the Arabic version of the Persian *murghān*, as these words are nearer each other.

Abū Zayd Arrajānī says: "*Bussad* actually comprises stone pieces having slender and broad boughs." But we have not seen this stone: all we have seen are these slender pipes which people call the root of the *bussad*.

Al-Kindī writes:

Vinegar renders *bussad* white, whereas oil makes it lustrous. The big *bussad* having several boughs and weighing a *mithqāl* fetches a price of half to one *dīnār*, while the slender kind weighing a *mann*¹⁰⁵ is

priced at half a *dīnār* or less.

I had with me a tree of *bussad* measuring one and a half span. I charged four *dīnārs* per *mithqāl*. If the slender ones were unworthy, they would not be presented to rulers. We have previously mentioned that 'Alawī Tahartī had, besides presents from Egypt, a large *bussad* tree, the details of which, alas! I could not discover.

Bussad is often smooth. If you happen to closely examine it in the centre, you will find very minute lines inscribed upon it in the manner of the lines upon the ventral sides of the fingers, and in the centre there are circles of the same kind. These circles are concentric. The neighbouring fingers also have the same circles. The roots of the fingers pass through these arched mortised triangles, the smallest being in the centre of the place of joining.

I believe that these lines have been created by God Almighty as the fingers are the most sensitive part of the human body, the tactile sensation being felt through them. These extremities and the inner parts have been made all the more sensitive as the pulse is felt through them. Roughness would obstruct the tactile sensation, and therefore, God has made them very soft and lined, so that they may be amenable to touch as well as perception in addition to clutching objects. It is difficult to clutch with a smooth thing, just as the seizure of a smooth thing is difficult. However, what we have said about the secrets of nature are our thoughts, and they need not be in consonance with the actual facts.

In our opinion, with the *ghubarī* ruby as the standard, the weight of *bussad* is $64\frac{13}{24}$.

Al-Kindī and Nasr write that *bussad* is a green tree of the Mediterranean having root and branches. When taken out of the sea, it becomes stony, hard and red. Occasionally, a piece of *bussad* weighs 60 *mithqāls* and it is called *marjān*. There is a kind in the Mediterranean which is not red but is inclined towards whiteness. It is called *mirāq*. There is another of the roseate colour. Brought from the West, it is called *fasiṇjānī*.

He (Nasr?) writes that a kind of it is designated as *dīlki* which I presume would be *dihlakī*, as he writes that it is brought from Aden. A branch (*bussad*) has been found to weigh one *ratl*. It was uprooted by the divers by means of tongs and brought-up like the pearl-shell. It is softened by the mill-stone and the striga plant and a hole is bored into it by iron made wet with water.

Al-Kindī writes that a variety of *bussad* is brought from Aden. It is white and worthless, as it becomes disorganised in the sea. It is uprooted by means of tongs.

This assertion of Al-Kindī attests to the fact that it becomes petrified in the sea and is uprooted by means of tongs. The white kind is the most inferior, while the red kind, very hard, rough and perforated, is the best.

It may be that this is the kind which Al-Kindī has mentioned. It is neither smooth nor very white; instead, it has a pale yellow coating.

Abū Hanīfah¹⁰⁶ says that *marjān* is the name of a spring vegetable. If the word, *marjān*, is Arabic, then it is not, obviously, an Arabicised word. It is a purely Arabic word. If this vegetable which is terrestrial is called *marjan* because of its resemblance with *bussad* which is a marine product then this is nothing but an extension of the imagination of the etymologists.

There are two villages, Sūr and Band in the region of Rabāt-i-Garwān, which is situated between Ghaznah and Jozjān. The water of the canal of these villages becomes petrified. I have heard that gilders fix wooden stakes which are like needles on the bank of this canal. When the water which sticks to them has petrified, it is dyed, and added to *bussad*. Clay also becomes petrified by air just as water becomes petrified. The clay of the kilns and the *sharakh* clay which is found in the pits of gold mines are also, likewise, petrified. Occasionally, the wet clay found in the tarns of the mountains becomes stone-like when taken out. All this is not a source of wonderment for those who see that milk, a liquid, forms bones and in the harder fruits, stones are formed by water. These stones remain intact even after the pulp has decayed for years together. The pulp that has decayed is like the flesh above the bones.

It is God Who prospers and assists.

JAMAST¹⁰⁷

It is related in the words of ‘Abd Allāh bin ‘Abbās (God be pleased with him) that the palace of Bilqīs (the Queen of Sheba) was built from *jamast*. But the people of Arabia designate ruby, emerald, crystal (beryl) by the name of *qawārīr* (goblets, flasks, decanters).

According to jewellers, *labanī* resembles *jamast*. But there is some difference between the two in that *labanī* is looser and less lustrous and is cut with iron. Its dust is like that of marble.

It is said that there are several mines of *jamast*. Its whiteness is inclined towards all kinds of colours. It is also found to have red colour having a violet tinge.

Al-Kindī writes:

The mine of this stone is in the village Safrā’ at a distance of three days’ journey from Madīnat al-Nabī. It is worn in cases of stomach-ache. One of the old *jamast* stones has the figure of a python inscribed upon it and bears an inscription in the coptic language which is not understandable. We will describe this figure later on.

Nasr writes:

It is a variegated stone, resembling the red (roseate) or dark-grey

ruby, but there may be found in it all the colours. The red one is the costliest and the grey one is the cheapest variety.

Arabs make ornaments from *jamast*. Pieces weighing one *ratl* of the stone are also found. In its native mine it is covered with ice-like whiteness and its face has a kind of rosiness. A mine of the stone has been located at Washjird in a valley of Saghāniyān which is called Rāmūd. But the *jamast* mined from it is turbid, and its largest pieces weigh two *ratls*.

In the *Kitāb al-Nukhab* it has been stated:

It is white, hard and vitreous, and breaks with a little pressure. It melts like tin on fire. A piece of the stone placed in wine invigorates the mind and stomach. It is not like the *hajar-i-'ambarī* which, if placed in wine, would corrupt the mind, making one insensate and lazy.

The description in the *Kitāb al-Nukhab* is in keeping with the statements of the scholars that intoxication through the wine having *jamast* in it persists for long periods.

It is God Who prospers and assists.

LAPIS LAZULI

Lājward (lapis lazuli) is called *armīnāqūn* in Roman. Possibly this is because of its association with Armenia, since the Armenian stone which is an expeller of atrabile, resembles it. Lapis lazuli is brought into Arabia from Armenia and into Khurāsān and 'Irāq from Badakhshān. It is said that '*awhaq*' is lapis lazuli, but the following verse by Zuhayr expresses a contrary fact:

I did not get any grain for its afternoon food, and it saw a tall ostrich.

It is said that *dahā'* is (the food) for the camel, as *ghadā'* (breakfast) is for men. *Samāwā* means man or existence. *Qashrā' wazīfīn* means the ostrich and '*awhaq*' tall-statured.

Its weight, measured in terms of its axis, is $67 \frac{7}{12}$. The best variety is that which occurs in the Karrān mountain, and it is brought from the Banjihir Pass.

Nasr says:

Its mine is found near the mountain of Bījādhī in Badakhshān. The largest piece of the stone weighs 10 *ratls*. It is cooled, polished and ground. It is used as a dye. In its original state it is azure, but is sometimes also inclined to be blackish. Occasionally, the lapis lazuli that has been rubbed and polished has golden stars like particles of dust upon it. It grinds facily because of its softness and becomes lustrous after being ground. The colour which it then gives is so

pleasing that none of the stones resembling it displays such a beautiful colour.

Its mines are in Tūthbank. It is called Tūthbank as there are many white mulberry trees there. Here is found a variety of lapis lazuli which in softness and brittleness is like the leek. It has the greenness of the pistachio. We believe it to be malachite, but, since on melting it releases ten *dirhams* of silver, possibly this is not so, as jewellers say that malachite, on melting, gives copper, not silver.

It is God Who prospers and assists.

MALACHITE

According to jewellers, it is called *dahmāj Farīdī* in 'Irāq, *Farīdī* in Nishāpur, *Wanjūyih* in Herat, and *Tūtiyā* in Hindiya, as the people of India believe it to be a kind of *tūtiyā*.

Hamzah says it is *dahānah* and is a variety of turquoise. Al-Kindi says that a mine of malachite is found among those of copper in the caves of mountains of Kirmān. When melted in a crucible, it gives copper.

It is said that it is used by alchemists. If this is so, this explains why it is soft and greasy, and does not alter on heating. It has (patterns) like the eyes and green moons.

Al-Kindī says that, during the days of prosperity of Īrān, large pieces of the mineral were found, and utensils used to be made from them. Whatever was in the mine gradually became depleted and nothing was left.

One of its varieties is the Sigzī. It is rated less than the Kirmānian kind, and inferior to both is the kind which is associated with Arabia. One variety of it is found in a cave in the desert of Banū Salīm. If put into oil, it becomes very green. Nasr writes:

It is a hard mineral stone comprising three kinds. The Marwānī (so called after the discoverer of the mine) kind is found in the copper mines of the mountain of Kirmān. It is variegated in colour and has veins having eyes and half moons. Rubbed with oil, it gives the glossiness of copper. The Khusrāws of Persia had their dinner sets and saucers made from it. The mine is now totally exhausted and all that remains is like red putrid mud. The second kind, which is more recent, comes out of a copper mine and is closer to the Marwānī kind. The third kind comes from Arabia and is obtained from the way leading to Makka in Harra' Banū Salīm. Its greenness becomes glossy with oil, and, if left in the oil for long periods, becomes darkish. It is soft when freshly mined, but keeps on gradually hardening. If placed in sesame oil, its glossiness is enhanced. It is rubbed

with concentrated vinegar, placed in leaven and finally in ash.

Abū Bakr bin Muhammad Zakariyā Rāzī writes:

Dahnaj (malachite) is Egyptian as well as Khurāsānī, but the Kirmanian kind is the best. This, lapis lazuli, turquoise, and haematite are the golden stones.

Probably he wrote this, as lapis lazuli has goosy eyes which are gold-like, otherwise he knows all too well that lapis lazuli bears relationship to copper, and, because of its coppery sheen, it looks more pleasing than gold. About malachite and turquoise, he writes:

Both through the action of air become altered in their transparency and opacity and some people, for this reason, do not like them."

The author of the *Kitāb al-Nukhab* writes about malachite that it is very green and has a tinge of rustiness. It has very slender black lines intersecting it and occasionally a mixture of redness is also found. Its one variety is *fā'ūsī* (peacock-like) and the other is the *muwashshā* (printed).

The *Kitāb al-Mashāhīr* says that *dahnaj* comprises green grains with which gems are rubbed. *Dahnaj* is its noun singular. It would have been nearer probability if it had been said by the author of the work that gems and counters are made from it.

Sihār Bakht writes that *dahnaj* is *hajar al-missan*. He has elaborated in support of this statement by stating that *missan-i-'aqīq* is the green stone which is *dahnaj*. I fail to understand why he has said this, except that both stones share their green colours.

This green colour looks pleasing in *dahnaj* and unpleasant in *missan* (whetstone).

Al-Kindī says he saw an old and broad malachite piece weighing nine *ratls*. The Sijzī variety of malachite is found in weights of up to 20 *ratls* and the kind found in the deserts of Arabia weighs up to 10 *ratls*. The mineral which is taken out of Harra' Banū Salīm weighs up to 2 *ratls* and the Kirmanian kind is one-half of one-sixth of a *ratl*.

YASHM¹⁰⁸

This stone is mined from the region of Khutan in the middle of a valley of which the chief town is Ajmah. There is a valley by the name of Fāsh from where the best white *yashm* is mined. No one can reach its source. The large pieces of the stone go to the kings and the smaller ones to the subjects.

There is another valley known as Qarāfash. The *yashm* which comes out of it is blackish and opaque and in some pieces the dark colour becomes so predominant as to assume an excessively black colour, as in *sabaj*. A person who had visited this valley narrated that he had taken a 200 *ratl* piece of *yashm* for the king of Qatāī in the old times.

It is said that *yashm* and a species of this stone are called *hajar al-ghalbah*, and the Turks employ it for decorating their saddles, swords and belts, so that they may vanquish their enemies. Others, following them, had rings and clasps of knives made from it.

In the *Kitāb al-Nukhab* it has been said that *yashm* is the *hajar al-ghalbah* and the Turks use it so that they might overwhelm the enemies and so as to avoid pain resulting from heavy victuals, e.g., vermicelli, unleavened bread, roasted meat and meat balls.

Nasr describing its characteristics says:

It is harder than turquoise. Its colour is milky. Floods bring it down to a valley of Turkistan, called *Sū*. It is cut by means of the diamond and belts and rings are made from it.

Turks believe *yashm* to avert the evil eye. It is also said to remove the after-effects of clouds and lightning. As far as the evil eye is concerned, this is idle talk. But as far the lightning is concerned, I saw a man who claimed this property for *yashm* spread a thin piece of cloth upon the surface of *yashm* and placed a burning ember over it but it not burn the cloth. However, this is not particular to *yashm*. Iron mirrors achieve the same effect, but they do not avert lightning; in fact, lightning melts them.

In the books upon medicine is described a stone known as *yashb*.¹⁰⁹ It is said to be good for stomach aches and is for this reason hung from the neck. These books also say that some ray-like pattern is drawn upon it. Galen says he experimented upon a *yashb* stone that had no pattern upon it. He found that it was good for stomach pains. This drawing was of a python. We have already described it in connexion with *jamast*.

Ibn Māsah writes that it is yellowish and the *yashm* brought from Khutan is *labani*-white. From this one gets the impression that *yashm* is something else than *yashb*, but later the belief grows that it is the same which we have described in the beginning under *yashm*, viz., that the Turks use it as a corrective for indigestion, especially as the people of Tirmiz call it *yashb* and the people of Bukhārā *alshab* and *ashb*. They also say it is a white Chinese stone, which they occasionally call *bāsh*. Some say that *bāsh* is not *yashm* but a similar stone. It is softer than *yashm*, so soft, in fact, that even the teeth can affect it. *Yashm* cannot be ground by the teeth. Both are used as stomachic.

SABAJ

It does not belong to the species of stones that are rated precious. Indeed its beads are considered to be so worthless that they are hung from the necks of donkeys. Rich people have bodkins for collyria made from it, as it does not become rusty. It should be used in eyes that have

moisture, as it is bituminous. It is *shibah* in Persian. It is a very black, soft and light stone. It catches fire and I have heard it said that it burns even in very bright sunlight. It gives off the odour of naphtha and what we have said so far testifies to its unguent nature. It is a concretion of naphtha hardened into stone. It has the appearance of a black stone and looks like the black stones employed in Farghanah in heating ovens. Its ashes are later used in washing garments. As a matter of fact, there is a mountainous column in Farghanah from which pitch, *qar*, naphtha and what people call *chirāghsang* and which is a black wax, comes out. Sal ammoniac is obtained around Buttam. It has copperas, quicksilver, iron, copper, lead, Aylaqī turquoise, silver and gold. But the burnt variety is found in Farghanah. It is like the waste of naphtha and the dross of *sabaj*.

The mine producing the best variety of *sabaj* is in Tabrān in Tās. Being very large, mirrors and utensils are made from it. It is found in wet and putrefying soils. Fire catches naphtha: in much the same way, it arises from *qar* too, as these are both two species of the same genus.

Galen says:

The black stones that catch fire are brought from the eastern mound of Ghawr. These mounds are around the Dead Sea, where Jew's pitch is also found.

In terms of axial measurements its weight is about 28. I have, however, little confidence in its weight, as it has a profusion of bubbles which are large in volume and less in weight.

God alone knows best.

BEZOAR STONE

The early authors have said that a well-known stone is so named, although they have omitted to mention its characteristics and features.

As a matter of fact, this stone should have been the costliest among stones, for, whereas jewels are things of the body and adornment, and are of no use in bodily ailments, the bezoar stone guards the body and the soul and saves them from being harmed. We did not describe it before all the other stones, thinking it more logical that it should be described along with stones belonging to its genus. Muhammad bin Zakariyā Rāzī says:

The kind that I saw was soft like the Yemenite alum. It scattered and broke into pieces. I am filled with amazement at its wonderful effect".

Abū 'Alī ibn Mandawayh says that it is pale with white and green hues mixed with it. Hamzah and Nasr both say that it is primarily associated with India and China. In the *Kitāb al-Nukhab* it has been said

that its mine is in the mountain of Zarand within the boundaries of Kirmān.

Hamzah and Nasr have described fine kinds of the stones. These are white, yellow, green, dusty and abrasive. Nasr has, however, selected the dusty kind. He has prescribed a dose of twelve barley grains for the poisonous kind. The author of the *Kitāb al-Nukhab* says that one kind of it is beet green and pale, while another kind is reddish-white. One kind is thin and has something filled inside it. It is called the snot of Satan and the Warlock's thread. It also does not catch fire. Abū al-Hasan al-Tabari al-Turunjī says:

There is a coloured stone which appears to have been made from wax, lime and earth. All the three stones are glossy. If rubbed upon a stone in conjunction with turmeric, it gives off a liquid which is like fresh blood. Its poultice is very effective against bites of poisonous animals. Bezoar-like stones are brought from Tūs. While they look like the bezoar stone, they are of no medicinal use and are employed in making handles of walking sticks.

Different methods for testing it have been described in books. It is useful to copy them, although they are not established methods inasmuch as they have not been continually tested. One is that its dust is thrown into milk. If it congeals, the stone in question is genuine and good, otherwise it is useless. The next method is that a soft bezoar stone is rubbed upon a stone and then upon another bezoar. It is genuine if its colour turns to red. This is according to the earlier statement by Abū al-Hasan Turunjī. The third method is that it should be rubbed with vinegar and then thrown upon the ground. If it swells, it would be good. The fourth method is that it is thrown into the yolk of an egg or into a viscous oil. If it makes both melt, and attenuates both of them, it is of a high quality. The fifth mode of testing it is to throw it upon a leaf. If it alters, its genuineness is assured. But it boils and swells if thrown upon the ground and treated with vinegar. 'Utārid bin Muhammad says that it "perspires" if placed before the sun and begins to bleed. I take it that this stone would be *hamra*.

Stories pertaining to Bezoar

Uninflammable garments were made from the threads of tenuous bezoars that had their cavities plugged with satan's snot. This is the same cloth which the Khusraws of Persia called *adharshust* (that is, washed with fire). Thus the word, *shust*, also began to be applied to the clothes not made with bezoar, although they were burnt by fire.

In A.H. 390 Ustād Hurmuz, the Commander of the forces during the war at Kirmān, was brought a white *shustukah* from the side of Zarand

and Kānūnāt. It used to be thrown into fire when it became dirty and the fire used to eat away its dirt.

The person who saw this garment says that, as a matter of experiment, fire was set to it. It continued for a moment, and, when it was extinguished, the *shustukah* came out clean and white. Wazīr Ahmad bin 'Abd al-Samad has also testified to this practice and he saw this practice employed in these regions. He used to say that these stones occurred plentifully in Kanūnāt. They were broken by something that was downy and threads were made from it. Whatever has been described was made from it.

Abū al-Hasan Turunjī says:

I saw the goblet of a monarch studded with gems. There was something amazing about the goblet. A person who had been stung by a hornet was administered hot milk in the goblet, and a poultice was applied to the site of the bite. He vomited, and a nettle-rash erupted over his body for the whole day, after which he was tranquillized.

It has been said about a gilder that he brought a stone to Washmgīr and told him it was a bezoar. He thought that Washmgīr, being an 'Ajamī, would be easily deceived and he could pass off the stone as bezoar. Washmgīr, however, said: "If this stone is an antidote, I shall give thee both these things to drink. If thy claim comes true, I shall give thee ample reward." The person agreed, and expressed the desire to have a private parley with Washmgīr. When they were both alone, he said to Washmgīr: "Be it known to you I was inveigled by Satan and I thought of deceiving you. Please listen to a piece of advice from me to which, mayhap, you may agree." Washmgīr allowed him to proceed. The person replied: "The lives of rulers are in danger from their enemies who seduce their close relatives by bribing them with wealth and make them poison kings. When it becomes known that you have something that acts as an antidote, such people will give up the idea of poisoning you. You will thus be relieved from your enemies and be rid of the deception of your friends as well. What you, then should do is to send for a poison and also something that resembles that poison. Make me drink this spurious drink, followed by the stone. Then give me ample reward to show that I was true to my claim. I shall then in secret return all that you will give me. Please allow me to go without any injury and consign me to the Curse of God." Washmgīr, having heard this advice, told him: "The deception which thou had intendest to practise upon me through gilding, made thee worthy of punishment, but because of the advice thou hast given me, thou art deserving of reward, not of being stoned." Washmgīr did what he had been told, and, rewarding him generously, bade him farewell. He thus was snatched in the nick of time from the jaws of death, and virtually had a second life.

The Animal Bezoar

Hajar al-Tays (animal bezoar) is a Persian theriac. It is like acorn or unripe date, elongated and having peels like the onion, with something like green grass in the centre, something like a stone in the kernels of fruits. This is the central point of the peels and argues for the fact that these peels are arranged over each other. Its hue is blackish to green. Pure grains of this stone, in conjunction with milk, are liable to become red. Impure grains which the gilders make, remain green.

It is taken out of the stomachs of the mountain goats, but is of a very rare occurrence. It is called *hajar al-tays* for this reason, *tays* meaning the he-goat. Some through apocopation and orthographic error called it *hajar al-bīsh*. But this orthographic error is very true, correct and noble, since it is a theriac for aconite poisoning. Occasionally it is also called *bādzahr kibāsh*, since the word, *tays*, seems to be rather vulgar and *kabsh* (ram) good.

It is better to designate it by the name, *tiryāq-i-Fārisī* (the Persian theriac), since it is brought from the neighbouring areas of Dārā Bijarad. It is said that stags eat snakes and the mountain-goat also eats them. It then grazes upon the herbs of mountains and the snake it has fed upon, then rolls up into a spherical body. Thus, it is *tiryāq-i-Fāriq* (the best kind of theriac). It is natural, and not artificially made from snake pills. Its poultice is applied together with the aqua of anise upon the site of the bite. The pain immediately disappears and the colour of the skin returns to its original form.

Abū al-Hasan Turunjī says that a soldier was bitten by a very poisonous snake during a battle. The commander-in-chief of the army had nothing except *bādzahr kibāsh*. He administered less than a *qayrat* of it in wine to the soldier, followed by garlic. The whole body of the soldier was covered by dots, he passed bloody urine, and became cured.

It is collected in the treasuries of kings. Its price is very high and people are excessively covetous of it. I swear upon my life that it is the most precious of treasures as the soul enjoys it and benefits from it, more than from other jewels. *Tiryāq-i-lahazah* resembles it, and is picked out of the eyes of the stag. It accumulates in the corner of the stag's eye as an exudate. The Rāzī brothers say that the price of one to thirty *dirhams* of *hajar al-kibāsh* ranges from one hundred *dīnārs* to 200 *dīnārs*. Some persons claim that the Persian theriac is found in the spleen of mountain goats in the manner of *gāwīzan* which is found in the gall-bladder of bulls. Hamzah says *gāwīzan* is the Arabic version of the Persian word, *gāwīzan*, which is a palish object like the yolk of the egg. It is found from one *dāniq* up to four *dirhams*. When freshly taken out from the gall-bladder, it is soft and roundish, but, when kept in the

mouth for a little while, congeals and becomes hardened. It frequently occurs in India and is brought from there. People use it in theriacs and believe that it opens up the intestines and expels bile in the manner of the Persian theriac.

Allah knows best!

PISSASPHALT

Momyā'ī (pissasphalt) is like amber and is whitish. It is fragrant and deserves to be stored with care and respect for helping restore broken bones. In the *Kitāb al-Ā'in* (The Book of the Laws) it has been classified among the drugs which were stored in the treasuries of the Khusraws and was off and on given to the needy. It was used both as a simple and compound drug, and was also administered to those bitten by animals. In the *Kitāb al-Ā'in*, two kinds of pissasphalt have been described. These are the hot and cold kinds. It is indeed surprising to be told that it is cold, since pissasphalt is a kind of pitch and it would be strange to ascribe to pitch the properties of coldness. There are many statements about it and there are several varieties of pissasphalt. Some of them are standard and others unverified.

The author of the *Ashkal al-Aqālim* (The Characteristics of Countries) writes:

Momyā'ī is found in Dāra Bijard in a cave. It is reserved for the king and the mouth of the cave is guarded by sentries. At a specified time each year officials, despatchers of letters and the courtiers of the king gather together and unseal the mouth of the cave. Pissasphalt collects within the crevice of a stone in the lower portion in the size of pomegranate. It is sealed in the presence of these dignitaries and all the officials of the government take a little of it. This is the real pissasphalt. All the other pissasphalt varieties are counterfeit. There is a village near the cave known as *Ābīn*. The name, *momyā'ī*, is, therefore, an eponym, and is *mom Ābīn* (i.e., the *Ābīn* wax).

Other authors have said that, being like wax and melting facilely, it is simulatively designated as *mom* (wax).

Sirī Mawsilī says: "The meaning of the word is the wax of water. No one knows where it comes from or where its source lies. In Persia there is a small room which is kept locked and is guarded by sentries. It is opened every year at the behest of the king in the presence of his officials. The flowing water has a catchment having a strainer like a colander. The water passes through it. The *momyā'ī* that collects upon the colander congeals after some time and is deposited in the royal treasury." Abū Mu'adh Al-Jawāmkānī says it is of Persian origin and is a variety of pitch. The same thing has been stated by Dimashqī.

In the *Kumāsh Khūz* it has been stated that it is brought from the region of Māh. It resembles pitch and it is a gum that comes from the rocks of mountains. The translator of this work has criticised the author of this book and has said that it is wrong to designate it as gum, as gum comes out of a tree after ripening, whereas that which does not come on its own is the expressed juice.

The word, *māh*, denotes a mountainous ground. There are two *māhs*, the *māh* of Basra, i.e. Dīnawar, and the *māh* of Kūfah, i.e. Nahāwand. When *māh* of Sabdhān is also included, then all the three are known as *māhāt*. Sometimes, 'māh of Nahāwand' is also called 'māh of Dīnār'. This is an eponym — from the name of the man who was arrested and with whom Hudhayfah, had a treaty. Ahwāz is close to Fāris and the Jabal, and therefore, the location and preparation of *momyā'ī* at Khūz cannot be kept secret. However, we have described whatever information we have been able to secure.

Hamzah writes: "There is a *momyā'ī* mine in the village of Jawrān, which is situated in the town of Qūhistan in Tasūj-i-Karrān. It is also found in the Karkūkārān village which is also situated in the same district. Ta'sūj is situated between the two." But we have not seen anything coming out of it. It could be that the quantity of the *momyā'ī* is so small that only the people of that area benefit from it.

Abū Hanifah says: "The honeybee puts something like a seal upon honey and its offspring with wax, later depositing something evil-smelling, pungent and very black which is waxy. It is remarkably effective against injuries and wounds. But is rarely found and is called *momyā'ī* in Persian."

When a Ghazzī Turk entered the fold of Islām in the olden times and commingled with the Muslims, he used to act as an interpreter between the two. Whenever any Ghazzī became a Muslim, the Ghazzīs used to say, "He has become a Turkoman." The Muslims likewise used to say, "He has become a Turkoman," i.e., he has become akin to the Turks.

I recall an old prisoner at Baykund bringing gifts for the Shāh of Khwārazm. Among these presents was *momyā'ī* which he used to prepare by himself. He claimed that whatever he prepared was based upon the herbs of daily usage, and it was efficacious and quick-acting.

It so happened once that the supervisor of the watchmen who looked after the falcons broke the wing of a falcon especially beloved of the Shāh. Khwārazmshah was furious at this and ordered the leg of the supervisor to be maimed. I was present on the occasion. He was dragged and the executioner brushed his leg with a stick which was like the trunk of the date tree. An enemy of the supervisor exclaimed, "O executioner! should this be called maiming or only brushing?" The executioner, upon hearing this, became steadier since he could not evade the order. He

lashed at the ankle of the supervisor so hard that the whole bone broke into fragments and his instep was joined to the ventral part of the knee. He then asked whether this sufficed or should he go on. The supervisor was taken within the presence of Khwārazmshah, who had, meanwhile, relented. He commanded that the supervisor be administered the *momyāī* presented by the Turkomān. The supervisor was cured. I saw him mounted on a horse a year later with a falcon in his hand. But he could not walk naturally and had to use a stick as a prop.

It is said about the genuine-ness of *momyāī* that it should be dissolved in sharp vinegar and applied as a poultice upon a liver torn (from an animal). It should then be agitated by means of a knife. If it does not flow, it is genuine. Some people cut off the leg of a fowl and apply it upon the leg. Everything that is rare gains in respect and people perform experiments to test its power and potency.

Among the rare articles is a simple drug from India-*Shalājīt*. Some have said it is *shalājmah*, which is a fish found in the Indian Ocean. It is very difficult to catch it. Its skin is kept in a jar and is used for joining bones which is amazing. When cleaned and kept in the sun, it becomes reddish like honey. There are many statements on its characteristics and properties. Some have said that when mountain goats climb mountains in a state of frenzy, they urinate in the holes that give off foul smell. Light blackens the urine and the viscous liquid becomes pitch-like and oily. This is *shalājīt*. The same thing has been said with respect to onagers (*gūrkhars*). This is the reason why in Persian (*shalājīt*) is called *gūr kumūz*. According to Ibn Durayd, *sain* is the onager urine which contracts and is used in medicines. Some people believe it to be the "perspiration" of the mountains accumulating in orifices. The physicians of India prefer the *Shalājīt*¹¹⁰ that is blackish and has the smell of urine of the cow.

Once Abū Nasr had reached the extremity of Nahrawāla¹¹¹ in connection with some affair. He made attempts at gleaning information about *shalājīt*. He wrote in a letter:

I was in a village in the south of Sind. I saw some people who had brought *shalājīt* in leather pouches. The (people of the village) thronged around them for purchasing this article. On enquiry from me, the people pointed to a mountain in the west which is searched in places which are difficult to scale. They find it clinging to rocks in the manner of the gum which clings to the tree. Only God prospers and assists.

SNAKE-SHELL

Kharaz al-hayāt (the snake-shell) is called *mār muhrāh* (also snake-

shell) in Persian. There are two reasons why it has been so named. One is that it is of benefit to one bitten by a snake. It is rubbed, and then administered with milk or some other draught. In the *Kitāb al-Jawāhir* (The Book of Jewels) it has been stated that the snake-stone is beneficial to a person who has been bitten by a snake. It is suspended round the neck of the bitten person. This could be so. The second reason for its name is that it is extracted from the snake. It used to be gathered in the times of the Khusraws together with other medicines for the needy and indigent people.

Nasr writes:

Those who keep snakes, search for and keep a vicious snake which eats other snakes. This stone is found in its neck. It is white and pearly in colour. Some stones are black and white. This stone forms in the neck of the snake by the time it has consumed four hundred snakes.

I remember having come across a similar description in the *Kitāb al-Ā'im*, although I do not precisely remember what was written. Nasr goes on to say:

When the stone has formed in the neck of the snake, its forehead is pressed between two iron rods. The snake begins to have tremors and its skin, having been cut with a knife, is squeezed until the stone manifests itself. It is taken out. At first it is soft, but its contact with air makes it hard and stony. It is identified by being rubbed over a black blanket which should be soft and rough. The stone so rubbed would turn the blanket white.

It is said that the keepers of snakes make it from Mary's stone, and that it also turns a blanket white. But it is essential that a terrestrial object should be heavier than the object which concerns an animal. A knowledgeable person related to me that, a snake-charmer lived at Bust in his neighbourhood in a courtyard. One day he heard his wife letting out wild shrieks as if the snake-charmer was belabouring her. When he went to the snake charmer's place to stop him from beating his wife he saw him wailing and tearing off his clothes. He succeeded in eliciting the information from the snake-charmer that he had kept a snake so that *mār multrah* (snake stone) might grow within it. He used to take it to the roof so that it might get some fresh air, his wish may be fulfilled and the stone might appear. He had gone out to get a prey for it but his wife acted negligently. She left it in the sun with the result that it had died. Having said this, he showed him the dead snake which had two stones.

It is God Who prospers and assists.

The *Khutū*

Although *Khutū* is an animal product, yet people like it and collect it as a treasure. It is held in considerable regard in China and eastern Turkistan. It is of the family of *bād-zahr*. People like it because if a person is brought close to it, it begins to "perspire", as is said of the peacock. Whenever any poisonous food comes before it, it begins to quiver and shake.

When I enquired about the *Khutū* from the members of the diplomatic mission which had come from Qatā'ī Khān, they said: "The only merit about it is that it lets out perspiration when any poison comes into contact with it. This is why it is held in such esteem. It is the bone of forehead of a bull".

This is what has been said in books, although the only additional information which we could get is that this bull is found in Khirkhiz. Its forehead is thicker than two fingers which would show that it cannot be the forehead of the Turkish bull, as it is smaller-bodied. But it could well be the horn. As for the belief that it is the forehead of a bull, it would be forehead of the mountain goats of Khirkiz. Only they can have such foreheads. It is not brought from 'Iraq and Khurasān.

Some say it is the forehead of the hippopotamus which is also called aquatic elephant. It has patterns described over it and bears resemblance to the *pith* of the teeth of the fish which the Bulgarians bring to Khwārazm from North Sea which is adjacent to the ocean. It is bigger than the hand in size and the *pith* is longer in the middle.

It is known as the essence of the teeth (*jawahar al-saim*).

A Khwārazmian happened to find a tooth which was very white on the sides. He had hasps of daggers and knives made from it. The natural patterns described upon it were very thin, white and pale. It resembled the down of the cucumber if peeled in such a manner that the seed grains are also cut off. This Khwārazmian carried it to Makka, passed it off as (the tooth of) the *khutū* and sold it at a high price to the Egyptians.

If the peeled portion of the *Khutū* is thrown into fire, it gives out a fishy smell. This fact would show it to be a marine creature. It is said that the fumes of its smoke are good for piles just as the fish-bone is good for them.

A tradition which runs about it – and it is extremely difficult to check the veracity of the factual truth behind this tradition – has it that it is the forehead of a big bird. When it dies and falls upon an island, its flesh putrifies and scatters, but people preserve its forehead. Someone has mentioned that he was travelling in the wilderness of China along with some natives. The sky suddenly darkened and the people dismounting from their horses, prostrated themselves. They did not raise them-

selves up till the darkness cleared. When he asked them about it, they said: "It is God", and began to describe in an ignorant fashion the attributes of God, saying that it was a fowl in appearance.

These persons would have been nearer their purpose if they took the name of an angel or Satan: they believe it to be a very large fowl residing in uninhabited regions beyond the sea of Zanj and China, eating large ferocious elephants in the way in which the domestic fowl pecks at wheat grains. It is designated as *khatū* in their dialect as such a name displays esteem and respect: in much the same way they call their rulers *Khāns* and their wives *Khātuns*.

The horn of this *khatū* becomes available after a good deal of time. People encounter all sorts of ordeals in the search for it, and therefore, it is held in considerable respect.

The Rāzī brothers say:

The best kind is that which is like the scorpion. It should be pale-reddish, followed by the varieties that are camphorine, white, apricot-like, dusty and the *khaddānah* (which is like the bone). The most inferior kind is the peppery one.

All these characteristics pertain to colours and patterns. The Rāzī brothers further say that the price of the camphor-like variety is approximately equal to that of the scorpion-like ('*aqrabī*') kind. The price of the '*aqrabī*' variety, if it weighs a hundred *dirhams*, is a hundred *dīnārs*. If sold unweighed, its price comes down to as little as one *dīnār*. The largest piece which we have seen weighed about one hundred and fifty *dirhams* and had a price of 200 *dīnārs*.

Amīr Abū Ja'far bin Bānū had a large box-like case made of long and broad *khatū* planks. He used to express pride over this possession. Amīr Yamīn al-Dawlah had an ink-pot made also of *khatū*. It is appropriate to call it *jallābat al-mamālik* ('collector of kingdoms') as it augured prosperity for him but misfortune for others. He gave it as a gift to several monarchs, e.g., Amīr Khalaf and Amīr Abū al-'Abbās Khwārazmshāh. But it could not stay in their treasuries and, in fact, left them when they lost their kingdoms.

AMBER

I have taken up the description of *kāhrubā*, straw-attractor, after *khatū* as the Turks of the east hold it in very high respect, especially large pieces of it, provided these pieces enjoy good colours. Like *khatū*, they keep them in treasuries, and hold the Roman variety in greater esteem as it is clearer and its yellow colour is bright. They treat the Chinese variety more lightly as it lags behind the Roman kind in these characteristics. The only reason for liking it, is said to be that it averts

the evil eye. Its name, *kāhrubā*, testifies to its characteristics, as it attracts straws towards itself and at times even the soil that is found in them. But this can happen only if it is rubbed and warmed. It thus attains the power of attraction like *bījādhī*. It is called *al-qatrūn* and *adhīmītūs* in Roman (Greek). It is known as *daqnā* and *hayānūfrā* in Syriac.

Hamzah says:

Amber is a kind of bead which floats in the Western Sea and in the sea of Tabaristān. Its mine is unknown.

Hamzah and Sirī have both written erroneously. Probably they did not see grass, straws, mosquitoes and fleas in it, as we find in *sandarūs* which is the gum of *kāhrubā*. The only difference between the two is that one is lighter than the other. From the view point of axis, the weight of *kāhrubā* is $21 \frac{5}{12}$. *Sandarūs* and *kāhrubā* both are found in the two seas — the sea of Zanj in the warm zone and the sea of Saqalibah in the colder zone.

Besides, *kāhrubā* is not a bead, although beads, etc., are made from it. The pieces are then the genus and the carved objects are the species. Either it is left in its natural colour or else it is heated till it becomes red. It is warmed to the boiling point by heating in a water-tub made of brass, followed by heating in the aqua of sappan wood in a vessel made of stone. Red and yellow pieces are obtained and thus we get different species.

Kāhrubā pieces float in all the seas, in fact, in the rivers also. It is a useless exercise on the part of Sirī to distinguish between these two seas. The most that could be said is that it is found in both seas. It is not found in the Sea of Tabaristan. I should believe that the same is true of the Western Sea, if by the Western Sea is implied the Atlantic or the Syrian Sea. Besides how can it have a mine since it is not a mineral, just as it has no wings, not being a fowl.

Abū Zayd al-Arrajānī says:

It is a kind of gum like *sandarūs*. It is clear and scatters. Its colour ranges between yellow and white, and it is dispersible. Occasionally its whiteness does away with its transparency and makes it turbid. The kind that is reddish is very red and transparent.

Its tastelessness, as mentioned by Abū Zayd, derives from its petrification and characteristic of being stone-like. No taste appears in it even after trituration. Every petrified object is dry and breaks through shock and stroke. But it is wrong to call it dispersible as a dispersible object is one that scatters when touched by the fingers and the palm and not through tools.

Al-Kindī says:

Kāhrubā is a gum-like *sandarūs* which drips into the river from a tree

occurring in Saqālibah. After falling into the river, it congeals and moves towards the sea. It is thrown up the coast by the waves, and the kind that falls upon the ground does not congeal.

Paulos (Aegineta), on the other hand, says it is the gum of *hūz-i-Rūmī*. It flows from it and congeals. He has not described its fall upon the ground or the river.

Some through orthographic error have read *hūz* as *jawz*, but they have no proof, as Paulos has written that its oil is extracted from *hūz-i-Rūmī* during the springtime when there is an excess of oil. It is then mixed with oil and placed in the sun or cleared after heating for three hours. He has then described the oils of *jawz* and *lawz* (walnut and almond) separately. Also, those who have translated (this work) from Syriac into Arabic described it under the alphabetical word, *hā'*, not *jā'*.

Rāzī describes it under *hā'*, and, quoting Dioscorides, gives an account of its bud, flower, leaf-extract, and the Roman variety. Then he writes that it is said to be its gum. From Galen it is quoted that *kāhrubā* is its gum, having the potency of its blossoms. If *kāhrubā* were a flowing liquid, he would have said that it flows from the tree into the sea.

One of the men who had travelled to Safālah Zanj and the islands thereof, reported that the *sandarūs* tree is scratched and it lets out a gum after some time which begins to flow after a few days from it and congeals. The gum that flows earlier congeals first and the one that flows later congeals afterwards.

It is because of this that different kinds of insects are found in it. There are two kinds of *kāhrubā*: one is that which is found in our cities; the second is that which is very pure and rare. The distinction between the two is that the variety which is of everyday use swells when heated, and then contracts when taken near fire, whereas the finer variety becomes loosened on fire and becomes gummy.

The form of its pieces bears witness to its shape. When spread upon the ground, it congeals, as *saṅgh-i-'Arabī* accumulates under the acacia tree. Were it to congeal upon a tree, it would have spread in breadth and contracted in length as in the golden silk cotton-tree. *Sandarūs* is called *marīmadhūn* in Hindiya.

MAGNET

It has the character of *kāhrubā* in that it attracts things. But it is superior to it and possesses several advantages. It takes out the eyes of the needles from wounds, draws the points of scissors that lie embedded within wounds, and also used as a medicine. It is a Roman (Greek) word and is also called *armītiqūn* and *abraqaḷitā*. In Syriac it is called *kayfā-shafat farzālā* and in Persian *āhanrubā*, i.e., the attractor of iron. In

Hindiya it is *kaddhak* and *harbāj* which as if is derived from *āhanrūbā* – since the two letters *yā'* and *jim* become often interchanged in many languages.

Dioscorides says that the best kind is the colour of lapis lazuli and when burnt, becomes converted into haematite (*shādanaj*). We have neither seen such a magnet nor heard about it.

An unknown author has said that its best variety is black tinged with a little of red colour, followed by the kind that is of the colour of iron. It is said that a mine full of it and having an excellent kind is around Zabtarah on the frontiers of Rome.

It is said that the boats lying within the Caspian Sea have date tree planks rabbetted to each other, while those in Mediterranean Sea have the planks joined by means of nails. This is because the hills in the Caspian Sea contain considerable quantities of magnet, posing a danger to ordinary boats. It is otherwise in the other seas.

This explanation, however, is incorrect in that the boats which have date planks in place of nails also contain the anchor, instruments and tools made of iron, and iron goods, especially the Indian swords.

There are gold mines near Zābulistān, which comprise stones and also the wells that are known as Zarwān. These are alongside the town of Khashbājī. It is surrounded by hills in which occur silver, copper, iron and lead mines. There are magnetic rocks here. The rocks exposed to the sun possess less attractive power than those that are submerged under water. I despatched a man there to bring a powerful magnet piece. He told me that at the skirt of the mountain of Sharkān, he drew out a piece with a shovel which did not weigh less than 4 *ratls*. It seems that there was not such attractive power in that side of the mountain, for, if the partition between the two were removed, the attraction would have increased, since this spade was quite heavy and the power to attract grows with the weight.

In the *Kitāb al-Rahmah*, Jābir bin Hayyān says:

We had a magnet which could lift a weight of 100 *dirhams* of iron. After passage of time, it was unable to lift a weight of 80 *dirhams*, even though its weight had not diminished. All that happened was that its gravitational pull had been reduced.

This opinion is in accordance with our view that the magnet piece which is in direct contact with the air and the sun loses its gravitational force. Jābir further writes:

I had a 30 *istār* (= 19.5 grammes) piece which was able to draw 600 *dirhams* worth of weight of iron. Thirty *istār* weight is equivalent to 130 *dirhams*.¹¹² It was thus able to draw a weight equivalent to three and one-third times.

This is indeed a strange and unique fact. Wartak the Magian displayed

great dexterity in the gold mines of Khashbājī. He found there a magnet which, like its kinds, was neither dirty nor black. It was rather like the polished iron mirror. People thought it to be an iron mirror. It weighed 9 *dirhams* and could draw iron twice its weight.

Galen says:

Whilst in the mine, it is more powerful than iron. Both have the same shape, the only difference being that it can draw iron, whilst the latter cannot draw it. They can be distinguished from each other only through experience and keen observation.

He also writes that garlic and onion, when rubbed upon it, reduce its potency, while, if it is kept in vinegar over long periods, its potency increases. The same applies to the blood of the goat.

The power to attract is found, besides *kāhrubā* and magnet, in other objects as well. Thus bitumen attracts fire towards itself and *hajar-i-zaytūnī* (olive-stone) draws olive oil towards itself. Hence its name. *Hajar al-khal* draws vinegar and *hajar al-haban* (oleander-stone) draws water out of the stomach of the patient of dropsy. All these things are based upon hearsay only. We have not verified them.

A Jewish scholar told me that he had seen a stone in the possession of a Jew which could draw gold. He offered him fifty *dīnārs* for the stone, but he did not agree to part with it.

If this be so, it must have been a very precious object, since goldsmiths could easily extract gold out of heavy black sand (*zaghāl*), whereas for the extraction of gold from gold-dust, they have to take recourse to the magnet. This magnet is the size of a finger. When they insert it inside the gold-dust and agitate it, the black sand slings to it. *Zaghāl* is the heavy black sand which occurs with gold and does not separate on washing. Hence the use of the magnet. This fact also establishes the fact that the stone known as *‘awzsang* has "ironness" (*hadīdiyat*) in it inasmuch as this sand is its dust. As a matter of fact, the remaining black grains also belong to the same species as the magnet separates them from the other sand grains. This black sand is then sold to goldsmiths as it is of use for them.

The author of the *Kitāb al-Nukhab* says that, when oil is rubbed upon a piece of magnet, iron feels revulsion towards it and draws back from it. A magnet piece was brought to me from Bukhārā. It had considerable gravitational force on all sides except for a point which had the status of an angle. This had no attractive force and, on the other hand, repulsed iron. An even more amazing fact is that of an artisan who used to do work in my presence. He had all kinds of tools for cutting, forging and inscribing, made from iron. There was a sword for scraping and rubbing kept near them. I used to keep them upon a cupola-like object. When I brought some of them close to each other, I found a kind of

gravitational force in them. No one has been able to collect the forces of attraction and repulsion within one piece.

KHAMĀHAN¹¹³ AND KARAK

The prices of both these stones are those of beads. Shi'ites like to use the black stone for sealing, while the Sunnites, in opposition to the former, prefer a white stone for sealing, so that the distinction between the two sects may remain manifest. In *Aspīd Rūd*, the Shi'as use black and the Sunnis white banners as a matter of religion and sect. I had two rings for sealing purposes. One had a black stone studded on it, while the other carried a white one. I used each according to the occasion to please the members of both sects.

The best *khamāhan* is *Zanjī* and is very black. Its face is so lustrous as to appear white. Book-binders use it for polishing the gold (employed in gilding). A poet says in a simile pertaining to the Syrian mulberry:

As if (there are) mulberries layer upon layer and meseems there are dots of the dragon's blood upon iron.

The author of the *Ashkāl al-Aqālīm* writes that its mine is situated in the mountain of Muqattam and the adjoining areas in Egypt. If so, it is associated with Zanj only because of its tint.

Among the jewels enumerated by Hamzah, is mentioned *hamānā*, the Arabic equivalent of which is *khamānākh*. I believe by this, he must have implied *khamāhan*. *'Awzsang*, in its heaviness and blackishness, bears resemblance to it. Gold-platers use *'awzsang* when *khamāhan* is not available. There are large rocks of the stone in Zarūbān which the Arabs call *m'az*. It presages the presence of gold whenever it is found on the surface of the earth or below it. We subscribe to the view that this too is *khamāhan* since it resembles the *Zanjī khamāhan* in colour and weight. It is polished and burnished with the calcined emery, as the uncalcined emery does not burnish it. *Hajar al-'awz* which has the mass of the axis has the weight of $103\frac{3}{4}$.

Karak is a white stone. It is very white and capable of being polished. In the *Kitāb al-Ahjar* it has been said:

Its mine is to the East. The better variety is whitish. Likewise, it is the pieces that are like the white earth which are better than the shells of the ostrich eggs and the pieces of white snail shells.

Among the shells of the marine animals there is a shell which is solid like the half of the soap-nut. This is a kind of a snail-shell, since it possesses a little movement. If it is placed upon a mortar which is kept a little askew and concentrated vinegar is thrown upon it, movement can be seen in it. But I have not been able to ascertain whether this movement is due to the absorption of the vinegar or due to an attempt to es-

cape from it through repulsion. I have not seen any stone which could be said to hold vinegar in repulsion. But I have (of a stone) which does not enter the vessel in which there is vinegar straight, but displaces itself from the vinegar and with a slight movement avoids it.

We will now extend our discourse to stones which are themselves well known by name but whose products and characteristics are not well known.

SHĀDANAJ

Galen says that, when rubbed upon a whetstone, it displays a red colour; hence its name. Names like *hajar 'asālī* and *hajar labanī* are also derived from their shavings. It is also called *hajar al-damm* (blood-stone).

Utarad bin Muhammad Hāsib's book, the *Manāfi' al-Aḥjār* (Benefits of Stones) details descriptions of such stones, but he has mixed up these descriptions, with practices of exorcism amulets, and quasi-magical practices. Therefore he has reduced his credibility, particularly with respect to the shell of which the Sughd make the shavings. In their book called *Tūbūsta*, they say that the stone whose cutting is yellow keeps one safe from evils and provides comfort to the heart. The red kind is meant for good results from deeds; the *kurrathi* (leek-like) kind makes for anxiety, agitation and commiseration, while the black kind is poisonous, and ought to be avoided. About the stone whose cutting bears a different colour with respect to the stone itself, it is observed:

If its cutting is white, it is good for industry and business. It is an antidote to the wounds inflicted by arms and does not allow wounds to fester. If the cutting is pinkish in hue, it is an antidote to grief and sorrow. The green kind removes fear and makes one feel safe. A white stone having veins of another colour running through it is good for the pustules of the mouth and pain of the molar teeth.

The people of Zarūbān have this to say:

The *hajar al-'awz* which resembles *khamāhan*, if rubbed upon a stone with water and if it turns the water red, is used for making the hair long and for inducing heavy sleep if it turns the water black, and for gold-plating if the water does not undergo any change.

All sustenance and help is from Allah.

THE DEPILATORY STONE

It is said that Bakht Yashu' found a stone which was enclosed in a sealed box. His slave, Busil (Basil) was asked about it. He said he would not disclose the nature of the stone until the Caliph made a solemn and binding promise that he would have him sent to Rome, since he would

not like to stay in 'Irāq after the departure of his master. When the Caliph Mutawakkil swore he would have him sent to Rome, he said: "This is *hajar al-halq*. It acts as a depilator and makes the use of lime redundant." When people tried the stone upon their wrists, it removed the hair. Mutawakkil was mightily pleased and had the slave sent to Rome. The slave, before his departure, said: "Since you have fulfilled your promise, let it be known that in order to keep the stone sharp, each year it is dipped in the warm blood of a goat." When this procedure was followed a year later, it was found that the stone had lost its efficiency totally.

Salāmī has narrated a tradition which originated with Ahmad bin al-Walīd Fārisī that there is a race among the Hindūs known as Dīpal. These people are black and act as guides for boats and ships on the sea. They have a stone having many small perforations. When they scrub their bodies with it, it acts like lime and takes out the hair by their roots.

It is God Who prospers and assists.

THE RAIN STONE

In the *Kitāb al-Khawās* (The Book of Properties) Rāzī writes:

There is a valley between Khurlukh and Bajnāk in Turkestan. When troops or cattle herds pass through it, the hooves of the horses and goats are wrapped in wool, and they are driven slowly so that they do not crush the stones, as the result of which black clouds would appear and a heavy shower would follow. People can bring about rain through these stones whenever they wish. A man goes into water with the stone of this valley in his hands, and moves them about to bring about rain.

This has not been stated by Ibn Zakariyyā only. There is no dispute among the authors in narrating this story.

In the *Kitāb al-Nukhab* it has been said that rain stone is found in a forest beyond the Khurlukh valley. It is blackish and slightly reddish. Such stories and legends gain currency when the people of different regions meet each other. Khurlukh, as has been mentioned by people, is an archaeological relic in our age. Between it and Pajnāka, the intervening area is so vast that there appears as big a gap between the two as between the East and the West.

A Turk brought to me a stone. He thought I would concede to what he would say without any argument. I told him: "All right, make rain-fall through it, but only in the season when it does not rain and make the rain fall on different occasions when I ask you to do so. I would then purchase this stone from you, and, in fact, will not only fulfil your wish but give you much more."

He put the stones inside water, and threw the powder skywards. He

kept on muttering and chanting incantations, but no rain fell nor did a single drop fall but for the drops which he had spurted upwards.

It is indeed nothing short of wonder that this imaginary property of the stone is subscribed to as a belief by the commonalty of people and even scholars have written these far-fetched things without having checked the facts for themselves. Among our contemporaries one has come out in defence of this property by saying that the stone does not have its effect felt in our land: it is confined only to Turkestan. In the support of his argument he said: "If garlic is brayed at the summits of the hills of Tābaristān, rainfall would immediately follow, and, when animal and human blood flows there in profusion, the rainwater would wash the ground and take away the corpses. No rainfall can be induced in Egypt, whatever device is adopted." To this my reply was: "This appertains to the situation of the mountains, their structure, the blowing of winds, and the passage of sea clouds. Whatever you have spoken about Tābaristān is also within my purview. Such things are often said. Those having wisdom know all too well that wherever there are reservoirs, lakes and rivers, men and women take their baths and wash their clothes; later rain, air, or snowfall washes away the dirt. It frequently happens in mountainous areas that all traces of dirt are removed, especially during the rainy season; and still people continue to believe in unnatural things."

The same thing is said about a valley known as Ghawrak, situated between Baghlān and Barwān.¹¹⁴ People speak in much the same way about it. It receives considerable rainfall during summer and snowfall during winter. Different kinds of winds also blow here. We have passed many a time through it and encountered these along with a large number of troops. We stayed near the waters of the valley. *Demi-mondes*, impure and impious women visit these waters. Many of them having their monthly indisposition would bathe in them in order to purify themselves. There would be many in the army who would not care much about corporal cleanliness either. All these persons bathe here: and still people drink these waters, and wash their hands and feet in them. But at no time are there any signs of impurity present.

The association of such fictitious attributes with stones possibly relates to the intention of the original inventor of these tales that such stones should be removed from the particular area. For instance, in the village of Jund-i-Āl-i-Kirām there are two white stones. This village is at a distance of two *manzils* from Kābul in the direction of India. These stones are on the upper side of a valley where reed and papyrus grow. It was told among the people that anyone who breaks off the stones of the larger rock pulverises them, drinks the dust with a draught shall beget sons only, while anyone who breaks off the stones of the smaller rock

and drinks the dust thereof shall have daughters only. This superstitious belief was probably spread in order to remove these rocks from the way by people wanting to break the rocks and take their stones along. As a result, everyone who passes this way takes from this rock this useless gift for himself and his wife. This superstition would persist as long as the rock lasts.

There is a white stone at the Rās al-Thawr Mountain, nearly two *manzils* distant from Malitayyah. The warriors of this island take the dust of the stone for their wives (to administer as a love-philtre) so that they might love their husbands more and not look at any other man. A poet says:

The stone that would enamour the hearts of women, having menses, towards fools, is not to be found in 'Arfah.

HAJAR AL-BARD

Hamzah writes:

Only one stone among the stones that prevents hoar-frost and hail and which during the times of the Khusraws used to be called *sang mahrah* — remains extant in the village of Rūyadasht. It is a village among the villages of Qāsān, and is situated in the direction of Isfahān. Whenever clouds having hail appear the people take it to the fortifying wall or fortress and suspend it from the projecting beam. Clouds then disperse.

We find such tales and superstitious stories reproduced in books upon agriculture. One of these is that a virgin should come out into the open with a white cock or that a tortoise should be buried on its dorsal side. The foolishness and idiocy of such tales are self-evident. What else would these talks be except an exercise in futility? Their impossibility, both from the viewpoints of rationality and observation, is quite evident. Only those who seek escape from rationalism and demonstration resort to them and are inclined towards trivial things. The people of India have, in particular, exaggerated these superstitions as they are inclined towards beliefs in magical and animistic practices and are ensnared by the Brahmins. The latter exact toll in the form of foodgrains from the villagers saying that they have done away with hoar-frost. Their claim goes unchecked as the truth or falsehood of their claim cannot be verified. The fact is that the hail may fall at one place and not at another. A cloud carrying hoar-frost does not rain as would a rainy cloud at all places. Occasionally such a cloud is very thick, black and broken. It travels at a high speed, since it is wafted by air. If, therefore, it does throw large rain-drops, and, if the drops of water underneath it freeze, they take the form of hail. It is quite possible that one field may receive

hail, while the adjoining field may not. The Brahmins make the cultivator whose field has escaped the hail accept their claim, while the one whose field has received the hail is deprived of the power of argument. People wonder at the correct prediction of an astrologer, but are apt to forget that he has been making wrong prognostications all the time. The foolish people of India do not demand from them, in the event of an accidental prediction coming true, any proof or demonstration.

Among the articles that are kept in treasuries and are cast from stones, glass is one of them. This we propose to describe.

GLASS

Allah has mentioned glass in His Book, and He has implied its transparent and clear kind. He says:

"The similitude of His light is as a niche wherein is a lamp.
The lamp is in a glass. The glass is as it were a shining star."¹¹⁵

And further:

"And when she saw it deemed it a pool and bared her legs.
(Solomon) said: Lo! it is a hall, made smooth, of glass."¹¹⁶

It is said that this is the first glass that appeared in the world, and was made by the devils. The people of Persia associate its first appearance with Faridun's era.

It is called *īwīlūsīs* in Roman (Greek) and *zaghūrūghatā* in Syriac. It could be that *zuḡāj* is its Arabic cognate. It is cast from a well-known stone or from sand to which borax has been added. The substance is heated for several days on fire till it accumulates, clarifies and progressively hardens.

I think — although this is not a virtual certainty — there are different gems in the form of grains in the sand. If you look at it carefully, you will find black, reddish, white and transparent crystalline grains in them. Through the agency of borax, the glass particles are separated and the remaining parts are also removed. Melting over long periods results in all the ingredients being consumed and the transparent and clear glass remains. This dross of glass is called *mashūqūniya*. This dross is flat, white and brittle. It melts in the mouth. It is called *zabad al-zuḡāj*, *mā' al-zuḡāj*, and *mā' al-qawārīr*.

Suhar Bakht says that it is the daub of the Egyptian cups. This could be so. Axially, the weight of the transparent Syrian glass is $62\frac{19}{24}$.

Different colours are imparted to glass while it is being melted. These colours persist. Such colours are white or black or such a colour as would have the white colour dominating, e.g., the azure colour. In transparency a glass piece is not very different from the crystal piece, es-

pecially if the latter is free from blemishes and bubbles. But it is softer than the crystal and, being more profusely available, is rated lower. Its transparent vessels, which are wholly transparent and show what is inside, are preferred. Bukayr al-Sāmī says:

If a bowl of fine gold hides the defects of our wine, then surely a goblet of glass is better.

Sarī says:

It is a greater tale-bearer than the goblet of glass. What is inside him appears clearly although it be inside him.

And again:

My secret is as evident to thee, as in glass transparency and purity are self-evident.

In our discussion of *qawārīr fiddiyah* (silver goblets) we have already stated that what is implied are the characteristics of glass – not the properties of silver. *Fiddah* (silver) has been described only because people are familiar with it. By *biyād* God has implied the absence of any colour, and not milky-white colour. When poets call a goblet white, they mean that it is transparent, and not white. Then they advanced a few steps further, and began to compare goblets with pearls and skins of the pearl. Obviously, inasmuch as the apparent meaning of the word is concerned, they went astray from the theme and forfeited the chief purport of the image – the superiority and the transparency of the goblet. If a goblet is like pearls, nothing inside would be visible, and, if any one should peep into it, he would only see the wine. All their similes would come to naught. They might praise the glitter, colour and bubbles of the wine, but, if it is contained within the cavity of the pearl, it would be hidden from the eyes and would be one for the blind and the seeing.

‘Alī bin ‘Isā writes in his *Tafsīr* (exegesis) – and he has been seconded by Abū Muhammad Sūqābādī – that “clear silver-like crystal is superior to jacinth and pearl, and, since they both are superior to gold, such silver would be superior to gold.” This is mere quibbling and achieves nothing, neither in actuality nor in theory. Never has silver been rated higher than gold under any circumstance. How then can a special kind of silver be regarded as superior to gold?

This is nothing but the figment of imagination visualising a certain situation even though it may not have any basis or existence in actual fact. Every white and resplendent object is like silver. But a white object has never been seen to have been characterised by transparency. Even milk is not transparent, except if it congeals and the coagulated white portion is separated from it.

As a matter of fact, when we denote a thing to be white, we often mean that it is colourless and free from all kinds of colours. The poet, ‘Antarah, thus says:

When the new and fresh clouds poured rain upon the garden, it made every pond *dirham*-like.

The poet has not implied in the above couplet that the rain generated the colour of *dirham* since rain falls and flows. Ponds do not become rounded like *dirham*, but rather that they became clear and transparent, and the image of the *dirham* has been evoked, in that it is minted from silver. On this analogy they (the exegetes in their interpretation of the verse *ka annahumma al-yāqūt wa'l marjān*) have taken to imply the whiteness of the coral and the transparency of ruby. It is actually the reddishness of the ruby that is implied, since we find the crystal and glass to be more transparent than ruby. (God has evoked this image, as houris have the reddishness of ruby together with the whitishness of the coral.) It is not considered desirable for beauty to be devoid of reddishness. This is why the people of Arabia say: *Al-husn ahmar* (beauty is reddish). Therefore, we hear Bashshār bin Burd saying:

Put on an elegant dress, and wear clothes that have been dyed yellow.

And, when thou appearest in our presence, don the veil of beauty, since beauty is red.

And he further says:

From the (countenance) of (these) white (damsels) spills redness which charms the eye. Verily, beauty is reddish.

Dioscorides says:

In Palestine a certain grass is called *hashīshat al-zujāj* (glass-grass), since it acts as a detergent for the impurities sticking to bottles. It is agitated together with water in bottles.

Hamzah says:

There is a village known as Fahrūd among the villages of Qāshān, in the region of Isfahān. There is a grass there which becomes converted into transparent glass. I was given pieces of it. It was in the form of plants of different shapes and the people of the area employ it in different medicines.

Hamzah has not mentioned any medicine, although those who have knowledge about the coral-root should not find this to be an object of wonder.

MĪNĀ

Mīnā is a kind of glass, but it is compact and heavier. Lead is heavier than *mīnā*. Experts regard a mixture of *mīnā* as the original kind, while some regard it as being compounded from *marwāh* (flint-stone). It is a very white stone which sparks off fire. It is brought from valleys. If the flint-stone is not available, *hajar al-zammūd* is used as a substitute.

But it is rubbed before being put into use. Some regard it as a compound of red lead (*isrinj*). *Isrinj* is also called *sankh*. It is the lime of lead. The lead is burnt and roasted with sulphur till it attains a red colour. *Marwah* and *isrinj* are then leached out with water, giving the impression as if nothing remains.

There is another kind of *mīnā*. Here an equivalent weight of bruised crystal is mixed with *marwah*. Instead of *isrinj*, tin is calcined in two thirds of its weight and its lime is poured, followed by natron which is added one-fourth by weight. The compound then becomes lighter. *Isrinj* generates ponderousness in it, just as between lead and tin there is a proportion of lightness and gravity. We shall describe both these in our Second Discourse. The glassiness in *mīnā* is obtained through gravel, just as in glass and natron glassiness is obtained through sand. *Būraq* and *tankar* which are homogeneous things help in its quick melting.

From the borax which accumulates upon the crucibles is acquired the green glass. Some regard it as the real glass as it accepts all kinds of colours and it congeals in objects with which it is blown or in the kilns of glass-makers. Its weight, with the axis of the *ghubārī* (ruby) as the standard, is 99-1/3.

Some people use it in place of *isrinj* and the lead since this too comes out of the calcined lead, but this is poorer than red lead. As far as colour is concerned, they determine the yellow colour through red lead or the dross of the lead and also mention *za'frān-i-hadīd* (yellow iron) in this context. *Za'frān-i-hadīd* means rust. Greenness is associated with copper, whether copper is burnt to give *rūsakhtaj* (antimony) or is associated with dust or rust. Redness follows from calcined copper, blackness from iron dust, opacity from magnesia and white colour from ceruse which is calcined lead. The ruby-like colour is associated with calcined gold and the violet colour with lapis lazuli and agate. It should, besides, be noted that transparency is found in yellow and green colours and is removed by red, white and black colours.

There are different ways in which it is prepared and coloured. There are various statements upon these techniques, but the authority of these techniques cannot be believed until and unless the work of these experts has been personally seen and, in fact, these techniques have been repeated with respect to glass and *mīnā*. Cups are made in the same way too, and the chemicals and techniques employed in their preparation and dyeing are the same as described earlier.

PORCELAIN GOBLETS

In China different kinds of earth are added to, and mixed with the flint-stone which we have already described under *mīnā*. This earth is

excavated out of wells, and is excellent and pure. It is not rough.

I have heard about pure kaolin that flint is bruised to dust. The Chinese flint is better than the flint of other countries and is said to be as transparent as crystal.

The flint, after being brayed, is placed into moulds made of buffalo skins. The flint is stamped with the feet by the workers. The flint, after being brayed, is kneaded with water, and each labourer stamps it for a certain period when the responsibility, after a specified period, is passed on to another worker. Thus the workers rest and work at intervals, but stamping with feet is not discontinued even for a single moment as, if it is discontinued, the flint congeals and spoils. As stamping is continued, it becomes viscous and stretchable. It is then kneaded with the lime of calcined tin. Occasionally cups are made from it. When they become dry, they are coated with lime inside and outside, and placed in the kiln.

Wīnāl Sābī has said that the best goblets are brought from Yankjūh. Some knowledgeable persons have also added that, when the making of the goblets is completed, they are thrown in a reservoir. The water of this reservoir is agitated with the feet for ten to fifty years and at times even for hundred years. This practice continues from one generation to another. These are like glass, and, if they break, they are molten and recast.

Rāzī brothers say: The best kinds of large goblets are those that are apricot-like in tinge, transparent, slender and made from the earth that stretches on excavation and is sharp. This kind is followed by the *randī* (polished) and the gilded kinds. The prices of some reach to as much as 10 *dīnārs*.

I had a friend in Rayy who hailed from Isfahān. He invited me to his house. I was surprised to see that all the utensils in his house were made from porcelain. I was amazed at his magnificent taste. The cups, saucers, pickle jars, salt-cellars, plates, goblets, pots, glasses, even water-spouts, trays, basins of the bathroom, chandeliers, and articles of light, in fact, all the articles of this class, were made of porcelain.

ADHRAK

The author of the *Kitāb al-Nukhab* writes: "Adhrak is a noble stone, among those that are from the moulded stones of the Alexandrian times. It is ancient and beautiful, and pleasing, and in delicacy equals the ruby." Al-Kindī says that the cast and dyed glass and old *adhrak* having reddish colour is like the red ruby in colour. One piece of the stone costs a thousand *dīnārs* as it is no longer made.

Al-Kindī has also written that jewellers made every effort to make *adhrak* for the Caliph Mutawwakil, but all that they were able to make

was something like the rose. I have already mentioned articles that were sent as gifts to the Ka'aba: among these were ruby bottles. Perhaps they were made of *adhrak*. Besides Al-Kindī, other writers have said:

Red and yellow arsenic trisulphide, one part each; Kirmānian vitriol, one-fourth part; and Egyptian glass-sand, one part; were bruised thoroughly by the artisans and mixed. They were then soaked in vinegar, placed in a jar, the mouth of which was tied tightly. The jar was buried in an oven which was heated by cow-dung fire. The oven was covered by earth, left overnight, and the product was taken out of the oven.

Some persons have claimed that they prepared the green kind by taking one part each of borax and sand and added one part of calcined copper to 1/120th part of each (of the green kind).

The following procedure has been described in works whose authors are unknown:

Take a large piece of high-quality and hard realgar; soak it in the urine of the cow for three weeks. Place it upon a distillation still which is kept upon hot ash. Add as much molten lead as would remain above the realgar and then spray sulphur. When there are flames bursting forth, invert the still into the ash and bury it in the same ash. Leave it till it cools; take out the realgar, peel it and make gems from it.

The author of the *Kitāb al-Nukhab* has mentioned a stone whose name he has given as *Darnūk*. It is, according to him, pale-reddish, very rare, delicate and belongs to the Alexandrian age as to its casting.

Fasīṣafā is not among the stones that are cast. It comprises grains of gems which are gilded with silver or gold, and are embedded in the walls of buildings in Syria.

Among the stones cast in the mould (*masbūkāt*), Al-Kindī has described a stone known *‘ayn al-sinūr* (the cat's eye). He has said that it is found among buried treasures of Egypt and are shells having the graphic illustrations of animals. Small, coloured and grains are occasionally found by the prospectors among Egyptian treasures. These are known as *qubūriyah*.

The Yemenite people used to dig the ground and make long houses. These were the graves which we find described in treatises on history and geography, although their writings and verses are based upon lies. The swords, called *qubūriyahs*, are found among these treasures.

A king of the Yemen decided to invade China. His army, however, had an accident, and it became divided into two parts. One part of the army liked the region where this division had occurred, *viz.*, Tibet. The other party returned with spoils and slaves home.

It is said that the party which left Yemenite army and settled in

Tibet, followed the practices of the Yemenites in that they made the graves in the form of a house, burying the corpse together with his or her goods. He was buried along with a woman-attendant, and arrangements for their food and lighting, etc., were such as to last for a year. The grave was finally covered by earth. It seems that these people believed in metempsychosis like the Hindūs, whose women are burnt with their dead husbands.

Because of the persistence of this custom, coffin-thieves have been in existence. These thieves desecrate the graves in Turkestan and get nothing but minerals, gold, and silver. Everything else is eaten up by the earth. Mineral stones (*falazāt*) have ingredients that would (decompose) and melt on their own. The word (*falazāt*) is also employed for the jewels that are mined, even though they might comprise only a few kinds.

THE SECOND DISCOURSE ON MINERALS AND METALS

God has said:

“And (We) placed therein (*fihā*) firm hills, and caused each seemly thing to grow therein. And we have given unto you livelihoods therein.”¹¹⁷

The earth is meant for cultivation. Its produce is measured through the standards devised for this purpose and commercial transactions are, therefore, run.

The existence of mountains is appropriate to the production of objects that are or can be weighed. Wood is also weighed, if it is brought from mountains. The inner parts of the mountains comprise these things and they constitute the prices of objects, and the sources of livelihood are derived from them. In the word *fihā* the feminine gender of the pronoun attests to the mountain, since weight is for the stony ground and the measure is for the soft earth.

The creation of mineral deposits – or inorganic things – their order, arrangement and the capacity to remain in existence are all the works of God, and God has, therefore, said:

“He sendeth down water from the sky, so that valleys flow according to their measure, and the flood beareth (on its surface) swelling foam – from that which they smelt in the fire in order to make ornaments and tools riseth a foam-like unto it – thus Allāh coineth (the similitude of) the true and the false. Then, as for the foam, it passeth away as scum upon the banks, while, as for that which is of use to mankind, it remaineth in the earth.”¹¹⁸

Almighty God illustrates the difference between Truth and Non-Truth

by means of examples and similitudes which can best be appreciated by scholars who are overawed by falsehood. On the other hand, the ignorant ones are not only inattentive towards them but ignore the warnings and signs and tend to take them lightly.

“Lo! Allāh disdaineth not to coin the similitude even of a gnat.”¹¹⁹

The power of God encompasses all things above and below the mosquito in size and magnitude – a power which cannot be exercised by any other being. His Wisdom applies equally to everything and the wrong has always been dispelled by righteousness. What is evil and wrong is erased forever as foam passes away forever. The same thing is true of the minerals that melt. Fire having flame dispels their dross and froth. The latter becomes like dust and, being useless, is washed away. The foam-ridden water of floods remains on the ground for a specified period, but nothing on earth remains ever the same: everything goes back to its origin. Every living thing, as should be obvious, gets benefit from this water, since it is upon it that life subsists; and life is from it. The usefulness of jewels is that they perform the function of serving as exchange commodities in payment for articles. People forge jewellery from them. They are for adornment and beautification. Copper, brass and iron (which are base metals) serve as assets that confer advantage and protection.

The physicists have stated that sulphur is ‘father’ of the melting substances and quicksilver their ‘mother’. By melting it, the fire reconverts it into trembling quicksilver. Such being the case, it may preferably be discussed first.

QUICKSILVER

Quicksilver or mercury is also called *zāwūq*, whence the verbal noun, *tazwīq*, that is, to wash over an article with quicksilver. Base coins which are washed over with quicksilver so as to pass as legal tender are designated as *muzabbaqāt*. It was not a long while ago that thick *dirhams* whose edges were smooth and black like the pans of weighing instruments were current; they were called *muzabbaqah*.

It is said that these coins were made from the mercury separated from sand. The coins are current in Makka. Transactions through them were discontinued during Hajj so that all the gold and silver that was with the pilgrims could be acquired. They again came into use with the departure of the pilgrims or the ringed *dīnārs* were employed as tender.

When heated upon fire in conjunction with sulphur, it yields cinabar. Sulphur removes its liquidness and produces redness in it. Lead, in

much the same way, on being calcined is converted into red lead. Both are designated sometimes as *sanjfiryyah* which is made from quicksilver.¹²⁰ The prefix, *Rūmī* (Greek), is added to such a compound, as it was fetched from Rome (Greece and Byzantine) in the early times. But now only red lead is produced in that part.

Quicksilver is averse to fire except if it is kept in a hot spatula when it stays there for quite some time. The reason for this is that like water, quicksilver is a liquid, and fire sublimates it into vapours. When it has assumed its original form like water vapours which have condensed into water after the temperature has come down, the quicksilver collects into tight and narrow crevices. It can easily force its entry into objects that can melt facilely, but not so facilely into iron. It tears gold into pieces, both through its material form and its odour. Its odour, if it reaches a gold piece that lies at a considerable distance from it, is carried by the ambient air, and it tears that gold piece apart. In fact, its odour is deleterious to artisans and goldsmiths. It generates wastage of the body, inflammation and paralysis.

Since it carries a poor association with iron, helmets and shields are washed with it in conjunction with gold. At first an alloy of gold and later that of silver is plated over it. Galen could not determine its origin – as to whether it is a mineral object or is made like ceruse and litharge.

Ibn Mandaway quotes the authority of Māsarjawayh to say that it is not natural but man-made.¹²¹ Other authors write that it is made from lead, which is erroneous since it is taken out of red stones (cinnabar). These stones are heated upon fire till they burst, and the quicksilver begins to pour forth out of the perforations.

Some people bruise these stones, and distil them. Quicksilver settles down, with all the stones floating over it but for gold which settles down because of its heavy weight. This is not because quicksilver, clinging to it, draws it towards itself as some would have us believe. When we experimented upon this phenomenon through certain methods, we found this to be due to its gravity.

As we have regarded 100 of the *ghubārī* ruby as the standard measure of weight for precious stones, we shall have pure gold as the standard measure for this metal. An equivalent weight of the quicksilver in relation to the weight of gold is 71.

It is God Who prospers and assists.

GOLD

It is called *kharūsūn* in Greek (Roman), *dahabā* in Syriac, *sawrān* in Hindiya, *altan* in Turkish, *zar* in Persian, and in Arabic *dhahab* and then *nudār*. The gold which is so pure that it does not have to be tested for

its purity by melting is called *'iqyān*. It is found in the deserts of the Sudan like soapwort pieces and is picked therefrom by the people of Sifālah i-Zauj.

A poet has said:

Like the pure gold which on rubbing comes out pure and genuine on being melted.

The word, *tibr*, is applied both to gold and silver. Some people tend to apply the word to brass also. Some denote by *tibr* all the jewels that can be melted, provided that they have not been used often. But a better known name is *dhahab*. Silver, etc., are not denoted by *dhahab*. It is said that *dhahab* is so called as it leaves its owner and does not return to him soon. Some have traced the origin of this word to the fact whoever sees it in the mine is seized with amazement, and he almost loses his sanity. Hence the proverb, *rujlun dhahab* (seized with amazement on seeing gold in the mine).

When Diogenes was asked why Gold is yellowish, he said it has many enemies, and therefore, it is afraid of them. In the *Diwān al-Adab*, *'asjad* has been given as a synonym for gold. It has also been said that all precious stones, e.g., pearls and rubies, are designated as *'asjad*. This is, however, erroneous. It is gold only which is called *'asjad* and none of the other jewels is called *'asjad*. *'Asjad* is an attribute of gold, not of any jewel. Probably (the author of the work) was deceived through the crown made of *'asjad*, which has precious stones studded on it. So he thought that the word, *'asjad*, applies to jewels too. We can call such a crown a crown of gold but the rest of the jewels cannot be called gold in the crown. The word, *tāj-i-dhahab*, is employed in the sense that, although jewels are studded on it, nevertheless, the association is with gold alone. Hence we know that *asjad* is gold.

Zukhruf is also a synonym for gold. As a matter of fact, *zukhruf* means a speech embellished with fine imagery and romantic fiction, which appears to be truthful. Then this word began to be used in painting and inscription for beautification and washing with quicksilver. Ultimately it began to be employed for gold. God has said:

"Or thou hast a house of gold."¹²²

It is a carved and decorated house that has been implied. Sometimes, the nuggets of gold come out in pure state from their mines and at other times they do not. In Zarūbān there is a mine known as *Tūthbank*. The gold from it is greenish. In (the mines of) Khutal it is yellowish and in the neighbourhood of Taghaz and Afghāniyyah it is light. This levity is either innate or due to bubbles, inasmuch as these bubbles are filled with water. Then there are those varieties which are purified on heating. There are other varieties that are washed, the process being designated as *tabkh* (cooking). The pure and genuine kind is called *laqat*, as it is picked up

from the mines in the form of pieces. It is called *rikāz* also. Thus we have the expression, *arkaz al-m'adan* (pieces in a mine), whether these pieces are the nuggets of gold or the mine is that of silver. Occasionally, it is found admixed or adulterated. It is refined and on refining is called *ibriz*. Thenceforward, it retains its weight and does not lose any of its weight, to the slightest degree, on melting. Abū Ishāq Sābī says:

When warmed in the fire of grief, I became progressively yellow like the gold which on heating comes out yellow.

Abū Sa'īd bin Dūst says:

I see that the weight of an old man becomes (gradually) reduced, but he gains in experience with advancing age.

Like gold which diminishes in weight, on being heated but gains in value.

It has been said for such a person, who appears unenamoured of red gold, that he is superior to it in esteem and respect.

Sometimes gold is found attached to a stone as if it has been cast along with it. Therefore, this stone is broken and ground. It is suggested that it is better to grind it with *mashājīn*. It is, on the other hand, said that on being pounded with it, it becomes pure and red. If this is correct, it is a strange phenomenon indeed. *Mashājīn* is the stone attached to the columns in flowing water for pounding purposes, as in Samarkand, cannabis is ground for making paper. Once the essence of gold is pounded and broken, it is free from the stone.

Gold is squeezed in a leather pouch together with quicksilver till most of the quicksilver is leached out of the pores. Whatever quicksilver remains vapourises on heating. Such gold is called *dhahab-i-zaybaqī* or *muzabbaq*. This gold is extremely pure, so pure that none other is purer. Once I prepared very pure gold through several washings. It did not leave any trace upon the whetstone nor clung to it. It begins to solidify immediately on leaving the kiln, and, if blowing is discontinued, begins to collect in the kiln.

The suspicion that gold is called *mustafshār* because of its softness seems to be well founded. Such gold was prohibited from possession by the public as a matter of political expediency and regal command during the halcyon days of the Persian empire. It was meant to be used by the kings alone. Thus Dhū al-Rummah depicts the image of such gold in the following verse:

'As if upon their adorned and decorated skins is limpid gold.'

Limpidity is one of the characteristics of gold, but, since the poet has used the word, *tamwiyah*, the original of which is *mā'* (water), the object likened has been conferred with its characteristics. Limpid water is dearer than all other objects and more excellent than they are, and the poet has associated gold with its characteristics. The hemistich by Abū

Dhu'ayb has already been reproduced in praise of the pearl:

'The Euphrates always sends its waves upon it.'

'Ubayd Allah bin Qays al-Ruqayyat says:

As if their backs have been appalled with the rays of the sun or molten gold.

This poet has mentioned gold because of the esteem in which it is held, otherwise gold, silver and copper at the time of melting become red. Hind bint 'Utbah says:

Some people are of unknown lineage, but we are from liquid gold.

Hamzah writes:

Sībāh was a ball made of dissolved gold. It was sportively held and rolled by the rulers in their hands, as today they dally with the balls made from an unguent. When the king pressed it, gold oozed out between his fingers as if he had squeezed it.

As a matter of fact, *mustafshār* is the wine that is squeezed by the feet for the public but the oozing of gold by squeezing looks surprising. It can ooze out only if pressed between two iron tongs. In order to establish the truth of his false claim, he has called it "dissolved". Chemists do have gold in solution. It is kept in a bottle and is water in constant motion. Its "goldness" has been lost, and its paleness is like that of arsenic.

A story occurs in the *Safr al-Mulūk* (Record of the Kings), a book of the Jews. Hiram, the King of Sūr, had sent certain gifts to King Solomon. Among these were shields, mails and liquid gold, which was used for gilding. It is easy to explain this phenomenon, but a false thing is false all the same. Abū Nuwās or Ibn al-Mu'tazz has employed this theme in the following verse:

We gave for her congealed gold, and she became liquid gold.

The gold twines which we shall shortly discuss were probably liquid, but when were these liquid? Who knows? A person saw in the possession of a merchant a gold piece which dripped like wax from the candle. It was natural, not artificial.

Abū Sa'īd bin Dūst says:

It is not a degrading thing for pure gold that pans of the balance are kept opposite to it.

If gold is compared to any other thing in weight, it remains less in volume. The pans of the balance for weighing it are usually made of iron.

An equivalent weight of gold in relation to that of iron is in the ratio of 151 to 163. You can understand it in this way. If a thing belonging to the same kind and having the same weight is placed in both pans of the balance, both pans will be balanced. But, if you weigh gold with something having the same weight, dip both pans in water and lift both of them. You will find the pan having gold to be heavier. God knows

best.

STORIES ABOUT GOLD AND GOLD MINES

The water of the Indus which passes by Wayhind the capital of Gandhāra is known as the River of Gold among the people of India. Some people do not like its water for this reason. In its source from which the river takes its course, it is known as Mūh and where its waters collect in volume, it is called Karsh which means "black", as because of its depth, it is green and limpid, and appears black. It is known as the 'River of Sindh' (*mā' al-Sind*) when it reaches in the vicinity of the site of the Shamīl Idol in Kashmir.

Pits are dug at the bottom of the river at its source. Water passes over these pits which are filled with quicksilver. These pits are examined after a year has passed, and the quicksilver is found to have been converted into gold. This is because the water near the source flows at a high velocity. The water carries nuggets of gold along with the sand. These nuggets are minute and slender like the wings of the mosquito. When these particles pass over the quicksilver, the gold sticks to the quicksilver and the sand passes over.

It is said that at Sharghūr there is a stream which is reserved for the chief Khān of the area. No one is allowed to approach it. The Khān has the stream cleaned every year and he gets a considerable quantity of gold. There is little doubt that this water is also like that of the Indus. A device has been introduced at one place to prevent the gold from flowing with the water and to sediment it.

The same is true of the river Jayhūn (Bactrus) in the region of Khutlān. The water that falls down from its source has this place closest to it. The force of the water loses its momentum here, and the water contains gold. Since it is close to the level ground, the water cannot carry the gold with it, and allows it to sink. When gold is taken out along with sand and earth, it is washed, leached and smelted so as to yield round grains like the fruit of the soapwort.

A person told (me) the name of a village in the hill of Khutal. He had seen it. He used to say about it that it was totally barren and did not produce anything. Spring rains are the sole source of sustenance of these people. When the rainwater flows down, the people of this hill take out their spades and knives. They dig the sites which have been flooded, and take out from below the earth, elongated tablets which are whitish and seem to have been cast with the gold running in long threads, as if a goldsmith has stretched these threads. They collect them and buy all the necessities of life, e.g., means of communication, food and so on. Were it otherwise, no one would have ever gone to them nor could they

have stayed there. God knows the requirements of His creatures.

Extremely slender gold wires measuring a few yards are found to occur naturally in Zarūbān, and seem to have been formed as if they look like wires employed in joining beads, the upper parts of boxes and socks.

The Indians from Kashmīr reported that the residents of the Dardar country are called Buhtāwarān and that these people are near Kashmīr from the direction of Turkestan. Sometimes gold accumulates in the fields within the (shallow cavities) left by the impressions of the oxen's steps. These gold pieces, however, are light and less expensive. These people say that the ox owned by Mahādīv, the chief of the angels, gave this gift to the ox of the cultivator. However, rarely are such pieces found and they are admixed with earth. As they are extremely rare and are encountered but very rarely, they cannot be located through search. Nor does it frequently happen that the hooved animal of any cultivator or shepherd should step over the site, and slip so that the nugget is manifested in whole or part, and then gradually collected.

A drum-shaped small stone, the size of the finger, was found in Zarūbān. The middle part of it was constricted and it had a gold ring like an anklet. There was another long stone like an emerald pipe with its elongated portion perforated and a gold piece was threaded to it.

An indented gold piece weighing 14 *ratls* was found in a valley at the foot of the Shiknān Mountain, where there is one of the fountain-heads of the Jayhūn. Likewise a gold piece weighing 60 *ratls* was found in a valley facing Shāh Wakhān. A prospector of gold found a gold piece which weighed 80 *ratls* in the valley of Sharasht. The chieftain of this place wished to purchase it, but the owner refused to part with it till the chieftain offered all the gold he had at a great loss to himself in exchange for it, and took the piece from him. He then had this piece suspended in front of his house by a chain to display his possession and proud boast.

In the Sarshanak mines of Zarūbān was found a gold piece measuring one cubit in length and one cubit in width. Its weight can be estimated to be in the neighbourhood of six thousand *ratls*. Now weight of the cube of water, the one side of which measures a cubit, will be one nineteenth part of cube if it were of gold.

The Jews located in the Sankzarīz mines in Zarūbān a gold piece which looked like an erect and forged tablet. It measured ten *dhiras*. There is a vein of gold in the al-Muhīb gold mines which would get wider and wider as one digs it or narrower and narrower. If the vein runs according to the latter trend, it would end when excavated. On the other hand, if it becomes wider, it would take the prospector to the source. If this vein is not continuous but dispersed, it may either be long or short, and the same position would obtain as described earlier. As for

its source, it has been said to be like a mill-stone. Some have said it is longer than this, while others have said it is shorter. (It is said) that these veins are spread on all sides of (the mill-stone) like the rays of the sun.

‘Ubayd Allāh al-Mahdī, the ruler of Egypt and al-Maghrib, had taken forged gold from here. These gold pieces were like cube-shaped mill-stones. He had the gold piece hung from the centre part of the doorway of his palace Al-Mahdiyyah on the side of the coast of Barqah. It could not be stolen as there were sentinels to guard it. The thief felt afraid of stealing it and also because it would have taken quite some time to perform this operation. Otherwise that was the difference between this centre-part and the mine except that here one felt afraid, while there was no fear in the mine? Were it not for the dominance by fear, people would have removed it and licked it with their tongues even if it were in the form of a sword or plate.

In much the same way the *Mahārāj* (which means ‘King of Kings’) of Zābaj had bricks of gold cast from his own revenues and thrown into a lake in which water enters during the tidal period. Crocodiles inhabit the lake. Whenever the *Mahārāj* desires to have the bricks taken out, a very large number of his servants congregate round the lake, shouting loudly, so that the gavial creatures leave the lake, and as much gold as is desired is collected. If one wishes to steal the gold, he will have to collect a very large number of people to shout.

The gold of Sifalah-Zanj is very red. It is found in Western Sudan in a round shape like beads. The prospector will have to measure his provisions, e.g., food and victuals, according to the number of the days he will have to spend in the desert. If a person can manage to take with him as much water as would slake his thirst while he is in the desert, he can hope to negotiate these deserts. This is all. The rest is a farrago of nonsense and fables.

The custom among the nautical businessmen of Zābaj and Zanj is that they do not trust these people as regards lease and purchase. The chiefs and the rich are kept as ransom and the goods they wish to take are carried to their people. These goods are distributed among them. They then move out in the direction of the desert and each one of them gets gold equal in worth to the goods (so has been mentioned by the narrators). This gold is in the form of clods. Returning to their ships, they hand (the gold over to) the ransomed persons from whom they receive money. When the gold passes to the hands of the traders, the ransomed persons are released and they leave with gifts, etc. The traders wash this gold with water, as it has been stated by them that a person once had put the gold in his mouth and had died immediately.

People who are not knowledgeable about these places should exercise care. Sea merchants if ship-wrecked and arrive in a wilderness, follow

the monkeys about the eatables available in the place. They eat what the monkeys eat, as monkeys have an appearance resembling that of men and, therefore, their temperament also bears resemblance to man.

The same procedure is adopted for performing transaction with the people of the Indies who row their boats swiftly in the direction of the dhows or swim towards them. These traders show their goods, and if a bargain is struck, the traders place their goods upon something like a balance and hang them in such a way that their hands do not touch them. The sailors keep the balance under control by means of stones. The second pan is hung towards the customers. They keep whatever they have in it. This pan is raised and the other is brought down. Each party receives its share and both jump at their respective share like beasts of prey. If they show any slackness, the people of the shore will run away with their share. They can neither be caught nor can their boats be traced.

A similar story is current about a bedouin Arab. He brought a deer to the pilgrims to sell. They bought it from him at a high price. When asked how he had caught it, he said he had run and caught it. They all called him a liar, whereat he challenged them to release it, so that he may catch it again, provided they were prepared to pay the price again. The pilgrims agreed and released the deer. The deer had not gone very far when the Bedouin caught it having run after it and realised the price again from them. The pilgrims laid a hearth for roasting it. When the food was ready, and the venison and bread were spread out on a sheet before them, the Bedouin dragged the sheet by means of a string, folded the sheet and the food, and took them away within the sight of the pilgrims, saying, "My young friends, this deer could not escape me while it lived, so how can it escape me now that it has been sacrificed and roasted? You have been blessed with wealth. May God give you more. My children are hungry and are waiting to see what I would bring for them. You have invited them to a feast. May God accept it and reward you." Having said this, he went away slowly humming a tune the while, as if making fun of them.

Among the legends that defy all understanding is that gold sprouts out of the ground (like plants) in the form of a shell, and becomes visible only when the rays of the sun impinge upon it. The actual fact is that such tracts as well as the deserts of the Sudan are the repositories of the flood water that flows from Jibāl al-Qamar and the southern mountains. These tracts were sea at first, but, as in the case of the land of Egypt, layers of soil began to be deposited upon them. These mountains contain gold and they are also quite lofty. Water, flowing rapidly and with intensity, brings with it large pieces of gold which have undergone weathering, and therefore, appear cast like shells. The appellation of the

'Land of the Nile' as the 'Land of Gold' (*ard al-dhahab*) derives from this phenomenon.

As for the statement that these gold-shells are visible with the appearance of the sun, i.e., at dawn, we can well visualise that it is extremely hot in these parts, and night envelops the whole area into darkness, making them invisible. When the sun is at the meridian, heat acts as a deterrent, and the gold is picked up at dawn when the heat is not at its maximum. It is not at all surprising to see gold display *reflect*, especially after a shower. Hence prospectors in ruined cities look for gold after showers. Rabi'ah bin Maqrūm Dabbī says:

The fair ones of the tribe are like burnished gold picked up in the morn after a heavy shower.

In so far as the statement that every trader is able to procure from the desert as much gold as would serve his purpose, this rather testifies to the fact that gold is abundant there and, therefore, people do not have to store it, especially if their hearts are pure and they are not oppressed by the cares of the future. When the Zangī gets a chance to live happily and sportively, and when he is able to brew coconut wine, he loses all consciousness and does not care for the world and what is in it. He then tends to regard himself as the monarch of the world.

The like of the Sudanese mines is not to be found anywhere else in the world. The gold of these mines is bright and clear and occurs abundantly. But it is difficult to reach these mines because of the intervening wildernesses and deserts. The people of these regions are not very keen about our culture, and the traders of the Western area (especially those from) Sajalmāṣah, take considerable provisions and water with themselves while going to the desert. They take Basran cloth for the Sudanese living beyond these wildernesses. This apparel is known as *mubajbajāt*, since the Sudanese like these clothes. These clothes dyed with different colours carry red borders, and have golden threads running through them. They display the clothes to the wild people from afar and talk to them in the language of signs, as they do not understand their tongues. They barter the clothes for gold. Further, the wild people have little liking for fair people, and avoid them as animals avoid beasts of prey. They do not like anything else except these clothes upon which they all fall frenziedly. The mines are situated within the inner regions of Sudan and Zarvīlah (in the West).

As the land of Bajjah lies between the Nile and the Red Sea at the extremity, it is reserved for old mines. It is at the distance of a few day's journey from Aswān as has been mentioned in the *Ashkāl al-Aqālīm*. The mine that approaches *Hisn-i-ʿIḏhāb* lies in the land of the Negroes. It is called *Majmu' al-Nās* as the gold in these mines is taken out from level ground where there are no hills. The income from these mines goes to

Egypt.

In the beginning and during its heyday the Zarūbān mine had large caves like houses in its hills and mounds. They were called *Akharāt*, i.e., the subterranean vaults filled with pieces of gold. This gold was like forged pieces of gold as if it was a treasure meant for the prospector. The prospector who located them did not have to earn his living afterwards.

SILVER

It is known as *arjūsā* in Roman (Greek), in Syriac *sīmā*, *sīm* in Persian, *Kanash* in Turkish and *mīpā* in Hindiya. Hamzah says that the word, *sīm*, from Persian has been arabicised into the *sām*, which means "gold and silver veins within the mine," but the word is more commonly used for gold veins. The word, *simānah*, is a Persian word which is employed as a specific term by the miners. It is employed for the pure silver which is mound-like and the size of a camel sitting in the mine, so that the owner of the mine becomes rich for the rest of his life.

Miners, therefore, have the adage current among themselves, 'Such and such a person has found a camel'. This expression is employed upon the occasion when a person becomes very rich. *Simānah* is rarely found and is only accidentally encountered.

Silver in Arabic is denoted by the words, *lujayn* and *sarīf*. It is quite possible that the word, *sayrafi* (money-changer) is a derivative of *sarīf* since *sirāf* means the interchange of gold, silver and money. The word, *Sawlaj*, is also employed for it.

Perhaps this is its characteristic, since good quality silver is called *fiddat sawlaj* and *fiddat sawlajat*. It is also called *gharb*, since it resides in the mine, but it is not in the character of silver alone to remain hidden in the mine; all precious stones remain concealed. Some authors have, however, said *gharb* is gold. A'ashā thus says:

When it is poured, it begins to shine in the hands of the cup-bearer;
and people throw *gharb* and *nudār* for the sake of it.

The word, *nudār*, is used for gold, and therefore, *gharb* cannot mean gold; it means silver. What is the use in saying *dhahaban dhahaban* (gold gold). It would be correct only to say *fiddatan wa dhahiban* (silver and gold). Therefore, the word, *gharb*, can only mean silver. Besides, people have also claimed that *gharb* and *nudār* are two kinds of wood from which wine-goblets are made. Abū Nuwās thus says:

He broke the seal for the sake of his friends, and lavished *lujayn* and *gharb* upon us.

Here the word, *gharb*, cannot be employed for silver, since it is meaningless to say "silver, silver". In our view the most appropriate meaning in

both the above verses is that by *gharb* is denoted neither silver nor gold but that wood from which the goblets of wine are made. Obviously, wood cannot have the respect enjoined upon it as in the case of gold, and the goblets of gold cannot be as large as the goblets of wood. The poet thus wishes to say that he has quaffed from both large and small goblets. By the small goblet he means goblet of gold and by the larger the *khash-bī* (wooden) goblet, i.e., he has drunk from the smaller goblets and he has tipped from the larger goblets. A poet before him has said thus:

We have tipped from large and small goblets at the behest of the Caliph and his minister.

Munakhkhal says:

I drank from the small goblet as well as from the larger one.

Apparently it means what we have said. Some people have said that *saghīr* means *dirham* and *kabīr* means *dīnār*. Some, on the other hand, say that *saghīr* means the price of the smaller camels and *kabīr* that of the bigger ones. In support of this meaning, they have quoted the following couplet:

I drank – and drank worth the cost of mares and horses of fine breed.

But, at the same time, it is quite possible that what the poet wishes to say is that he drank at the back of the horse and mares or that he had his fun having pawned them. Be that as it may, the most celebrated name of silver is *fiddah*. God Himself has said:

“They who hoard up gold and silver –”¹²³

And He says:

“... (Bright as) glass (made) of silver”¹²⁴

and further:

“Bracelets of silver –”¹²⁵

It is said it is called *fiddah*, since when its seal is broken, it comes out beautiful.

Abu al-Fadl ‘Urūdī Saffar says:

God provided shelter to silver in the hearts of the rocks on account of its dignity. When fire brings it out through excessively hard work, time hands it over to a malicious being whose heart is harder than the rocks.

At the village of Wastanah, near Zarubān, silver has at times been found mixed with iron although the two had not formed an alloy. It was, therefore, stripped as the silver came out without being melted. Once a piece of silver was dug out of the iron mines, it was cut and clandestinely distributed. Someone, however, reported the theft, and all the thieves were caught.

The weight of gold, equivalent to the axis of gold, is 54-5/8.

When melted with sulphur for different purposes, it discharges colour

like that of rust and, if mixed with it, it becomes blackish and leaves a burnt residue. This also becomes a part of its weight.

All sustenance and help is from Allāh.

COPPER

In Roman it is *khalqu*.¹²⁶ In Syriac it is *nuhās* and in Arabic *nuhās*, *mis* and *qitr*. God has said:

“There will be sent, against you both, heat of fire and flash of copper.”¹²⁷

It is stated that *Nuhās* means here the smoke. In support of this God’s statement has been quoted:

“The day when the sky will produce visible smoke.”¹²⁸

Here also exegetes have quoted *nuhās* with copper. If so, God has obviously implied molten copper as in:

“And when the Heaven splitteth asunder and becometh rosy like red hide.”¹²⁹

Since copper is a trustee of iron. Dhu al-Qarnayn said:

“Give me pieces of iron-till, when he had levelled up (the gap) between the cliff, he said: Blow-till, when he had made it a fire, he said: Bring me molten copper to pour there-on.”¹³⁰

Some expounders have interpreted *qitr* to mean tin, but tin is not the trustee of iron, it only fills it. God has, therefore, said:

“Their raiment of *qitrān*.”¹³¹

If *qitrān* here is used as a noun, then *naphtha* is meant, as their clothes must have been of *naphtha* to catch fire quickly, but if *qitrān* is an adjectival noun, it would mean molten copper.

The inhabitants of Khurasan and Iraq call it *mis*. They call chandeliers, since they are made of copper (brass), *misniyah*. The word, *misniyah*, is specific to chandeliers alone, although everything that is made of copper (or brass) can be called *misniyah*. It is called *rui* in Persian, but since *mis* is the more current synonym, *rui* denotes the copper to which tin or lead has been added. A variety of this is the black *mis*. If broken, it yields fine pieces (or grains). Its reddish colour has a darkish hue interspersed with white colour. The *Shibh* variety is made from it. Some people have said that it is not mined, but becomes dark by melting and blowing air.

A variety of copper is called *mis-i-kalān*, i.e., *nuhās al-humlan*. It comes to Khurasan from India. It is soft and does not flacker much on heating. If silver be mixed with it, it does not confer hardness upon the latter. It is said that this is so because it has gold in it.

A mine known as Naw Kazhdum occurs in Zarubān, so called be-

cause it has lethal scorpions within it. At times pure gold comes from it, with copper admixed with the metal, and sometimes both metals are distract and discrete. But the copper that comes out of it does bear a little of gold. When separated through the agency of heat and washing, each *manna* of the matter yields one *daniq* gold. But since the price of such gold does not fetch much, the process has been discontinued. This variety of copper does not have any precedence over any other kind. In antiquity, when iron was rare or unavailable in certain countries, it was copper that was employed. In the land of the Ghazzi Turks we get arrow heads used as amulets made of copper that testify to it. People put amulets made from these round the necks of children. The brass daggers and spears which have been excavated from Tabaristan are held to be holy by the Magians. Both parties hold both things to be associated with Heavenly lightning. Some people offer the following passage from the Qur'an in support thereof:

"There will be sent against you both heat of fire and flash of brass, and ye will not escape."¹³²

In the Book of Samuel, the Prophet, are described the instruments of war wielded by Kalyādh Falastini, that is, Goliath. All these were made of bronze: there is no mention whatsoever of iron.

How strange the vicissitudes of time are that the *ghatrafiyyah* coins and the silver *dirhams* run at the same rate of exchange, even though *ghatrafiyah* is a currency that has copper mixed in it. Abu Sa'īd bin Dust says:

I saw among the troops of al-Qābūs men as if they are menstruating or otherwise overtaken by pangs of child birth. I think that their stars appeared to be unlucky; this is because their *Dirhams* are moulded from copper.

It has been told to us about the Naw (Kazhdum) mine in Zarubān that its minerals are mixed. In case they are pure, the weight of gold, silver and copper in that order obeys a specified pattern. Their price also follows this order which is according to Nature.

The weight of copper as derived from the axis of gold, which is the standard, is 45-2/3. If burnt with vinegar or antimony or calcined in a glass crucible, it assumes a green colour. If placed in a crucible containing borax and oil, the resultant copper would be softer and cleaner than the original metal. If the green rust of the metal is rubbed upon silver or tin, its surface becomes reddish. Some rusts are not artificial. It is, therefore, said that when fire erupted in the copper mines of the islands of Cyprus, verdigris was produced. Nature can produce better products from minerals than man, but this natural process cannot be imitated, contrary to what the alchemists claim. Their claim that they can make better gold than the natural gold and that mines cannot turn better gold

than they can remains a claim only. Obviously what they would employ as *humlān* (adulteration) would, to say the least, be corrupt.

IRON

God has said:

“And He revealed iron, wherein is might, power and (many) uses for mankind. . .”¹³³

No doubt, heavy things can be made to descend from Heaven. But this is not what God has implied. Descent here is meant to imply creation, and this created object is marked to be a corrective measure for man's benefit and defence. But it is the habit of people that they look expectantly forward to His succour and wrath, as God has said:

“And in the heaven is your providence and that which you are promised.”¹³⁴

Obviously what is meant here is that something descends from Heaven earthward, but it is not *per se* a thing which can be made to come down from Heaven, or transferred to some other place, or made to fly. Thus God says:

“And we made the iron supple unto him; Saying: Make thou long coats of mail and measure the links (thereof). . .”¹³⁵

Sābighāt here are the shields that are among the armamentaria of war, to ward off blows by the enemy, and save one's neck. Therefore, He has said:

“And coats (of armour) to save you from your own foolhardiness.”¹³⁶

He has endowed his creatures who can learn moral lessons and are prostrate in adoration, power to argue through wisdom, and likewise for the obdurate infidels. He has made iron to descend upon them. He has endowed man with rule so that he may exercise judgment, bring about equality, and make wise judgments in cases involving litigation. All these three things, He has brought about through His Command. Man cannot remain deprived of iron, as has been said by ‘Adī bin Zayd:

Send this message from me to ‘Āmir so that he may tell his brother that I am tired oppressively by my tormentors.

The scale of justice is in irons and a sentinel keeps watch upon me. Man has to face all kinds of vicissitudes of fortune.

Since inveterate criminals are not tamed without being manacled by iron fetters, chains, and ropes, they began to call the superintendent of the god, *haddād*, since he used to prescribe legal punishment for criminals, and for preventing them from committing criminal acts, employed these tools. The poet, Kashājim, says:

This steel is the armament of war for warriors, and with it the barber

bleeds us.

There are two kinds of iron. One variety which is soft is called *narmāhan*. This is a word of the feminine gender. The second variety which is firmer is called *shābarqān* and entitled as masculine as it is hard. It is malleable, but refuses to be folded. The *narmāhan* kind is divided into two sub-species. The first is the *narmāhan* kind proper; the other kind is the water that flows from it when it is melted and separated from the stones. The second sub-species is called *dawsā*, and in Persian *astah*. In Zābulistān it is designated as *raw*, since it comes out quickly and flows even more quickly than iron. It is hard, white and inclined to be silvery.

Swords in Rome, Russia and Saqālibah are made from Shābarqān. They are occasionally called *qala'* (with *fat'ha* and *jazm*, i.e. the orthographical sign for remaining silent). Therefore, the *qala'* sword possesses clangour, whereas the non-*qala'* sword possesses an irritating sound. When a particular class of swords is attributed to it, the class is collectively called *qala'iyyah*. Some people tend to believe that these swords bear relationship with specific places, e.g., Hindiyyah, Yamaniyyah and Mashrafiyyah. They, therefore, say these swords are brought from a place called Kallah, just as tin is brought from there. Associating tin with it, they call it *Qala'ī*.

These swords are broad, and it is no surprise if their whiteness has evoked verses in Arabic. The poet (Ibn al-Hamām al-Murri) says:

We break their heads with hard stones, whereas Roman swords break
(in doing this).

In this verse he has alluded to Shābarqān, since Roman swords are made of Shābarqān only. 'Ajjāj says:

Roman ironsmiths have forged white blades from black iron water.
And further:

When death retreats, I strike them with *qala'ī* swords.

Here iron is implied from which the *qala'iyyah* swords are forged. The poet has employed the word *qala'* as an adjective to qualify the attributes of a sword, just as (the adjectives) *dhū al-faqār* or *dhū al-Shuttāb*. Ibn Rūmī says, for example:

Time takes possession of the *qala'ī* sword from amongst his swords.

The poet has implied: 'They pulled the vein of curdled blood.'

In his verse the poet has used the word *qala'* but what he has implied is the reverse of it, that is the *a'laq* = the leech. The rhyming pattern was arranged according to the metre being followed by the poet, and he, therefore, inverted the word, *qala'* to mean the leech. *Qala'u* also means the mast of a ship. Suwayd bin Abī Kāhil thus says:

It carries such vast waves and foam that it uproots masts.

The poet A'sha, says:

It turns upside down ships equipped with masts and tears apart their

breasts.

The masts of ships are often likened to flags. The word, *qila'u*, is employed for both boats and the summit of mountains. Rā'ī says:

It pounced upon them so cleverly that neither their shelters nor the mountain summits could save the hares.

The hawk which the poet is describing, neither allows the hare to seek protection within the forage nor upon the summits of mountains. Abū al-Najm says:

We do not load the slaves with more burden than they can bear; and we carry more load than mountains.

Qila'u' actually means clouds. Ibn Ahmar says:

Clouds shower rain upon it and its darkness envelops the day as if in a state of frenzy.

Zayd al-Khayl says:

The house has been destroyed, and clouds pour water there. Therefore, there is no human being inhabiting (that place).

Qila'u' means clouds. Clouds resemble mountains and iron is mined from mountains. Because of these shared characteristics, iron has been associated with sky (or Heaven), and God has said He revealed iron or made it to descend. Hudhālī the poet said:

Sufficient unto thee is *muhammad* – the heavenly steel sword, above the heart and below the shoulder.

The sword that is of clear steel that has been thinned through constant heating and the innards of the hungry bird.

The first verse of the first couplet clearly states that the birth of iron is heavenly and it was made to come down from Heaven. By *muhammad* the poet does not mean that the sword is of Indian origin, but has used the adjective as an essential attribute of it. Then in the second verse the poet more clearly alludes to what has been reported that when the lightning's fire strikes and tears the earth and penetrates, that site is excavated and iron is brought out, so that *qala'ī* swords are forged. He has said what others had said (before). As for the belly or innards of a famished bird, iron, having been cut, is heated like cinders and placed before the ostrich, so that all the dirt is removed and goes to the belly of the bird, and the iron becomes clear and worthy of being made into a blade. It is then pounded and polished with a furbishing instrument. Those who have seen the sight say that the ostrich gobbles up the hot iron, but immediately defecates it.

I have heard from some people about *shābarqān* that the Russians and the Saqālibans cut iron into small fragments. These fragments or grains they add to flour which they feed to ducks. Once the ducks have defecated them having eaten them, they repeat the same process several times. Having been roasted, it is annealed and swords are cast from it.

Ibn Bābak says:

The darkness of the battle scatters away with its glitter as clouds disperse with the flash of lightning.

Even if we had not known that the Russians made the swords of iron – which withstood hard struck blows (of other swords) – we could have inferred this from the sword of poet Abu al-Abyad al-'Abasī who said about it:

I have in my possession naught but shield and helmet,

And sharp flashing sword with the glitter of iron.

And also from the following verse of another poet:

When the sword strikes with both sides (at the enemy), something like salt comes out of the body of his mailcoat.

I understand that the poet is probably referring to his sword minted at Daws. Some authors have stated that, when lightning falls, whatever it gives out goes upwards and whatever burns in the atmosphere falls to the ground. Abū Ja'far Khāzin has said that lightning struck the house of a person known to him. A ball of fire rolled from the stone to the ground and disappeared in the garden. This rolling over was the result of gravity. It is said that lightning is more delicate than air and the flames of terrestrial fire. Its discharge from the intervening objects and its capacity to melt solid objects that can be melted argues for the fact that air accompanies lightning, thunder-bolt and light. It brings minerals from other places either by lifting them from the surface of the earth or by bringing it from inside lightning. We can quote the example of the iron that fell upon Juzjān. This iron piece was from an anchor. An expert on examination found that its shape had undergone a change through heat during its fall (to this part of the world). It was not steel, since cast iron is used in anchors, as its aim is to achieve weight. An inferior kind of brass piece fell on a rainy day in a village called Tā'un in Būshanj. It had perforations upon its surface, as if it was pock-marked. Such pock-marks are also found in the kind of iron known as *khubth al-hadīd* (dross of iron). It was hot when it fell. On being placed in water, it let out the sound of a sieve through which something is being sifted. It weighed from one to two *mannas*.

Among the kinds next in rank to the Daws variety is *Tubāl*. These are peels or flakes which scatter upon braying and pounding. It is the scoria and rust of this variety and on account of its red colour is known as *za'frān al-hadīd*. With the axis of gold as the standard, its weight is 41-1/3. Alchemists claim they can soften iron with realgar (arsenicum rubrum) and that it melts as facily as tin. When it solidifies, it becomes hard and its clangour disappears; but its whiteness diminishes. These, however, are the characteristics of the elemental iron. As regards the iron which is compounded from soft iron and its liquor, the liquor

denotes the fluid which flows out of it when it is heated. This is called *faulād*. Herat is celebrated for its *faulād*. It is called *baydāt* because of its appearance. These *baydāts* are elongated and spherical on the lower side according to the size of their crucibles. It is from these that Indian and non-Indian swords are forged. Composition-wise, there are two kinds of iron. One is that the *narmāhan* (soft iron) and its liquid are melted together in a crucible in such a way that both intermingle in a manner that one cannot be distinguished from the other, and may be made capable of being made into tools like files, etc. From this it strikes one that the *shābarqān* variety is from this kind and in a natural way accepts dilution. The second kind is that the metal cannot melt properly in the crucible and thus there may not be full union between the two, with the colours of both being distinctly visible. This kind is called *farand*. People like the swords that have the essence of *farand*, with green colour glittering on it. Such a sword has wrung considerable praise. Imr al-Qays says:

Propped in such a way by the sharp-edged sword, with passages for ants to crawl upon his back.

Ibn al-Mu'tazz says:

Flashes appear on both of its edges as if there are light clouds below the horizon.

And further:

He has the vanquishing sword in his hands in the midst of the army as if the sword has stripes upon its surface.

Burnished and clean, as if the furbisher has inscribed designs with jewels upon it.

Abū al Hawl Al-Himayrī says:

As if *farand* and jewels are like flowing water upon both of its surfaces.

A green shine is preferable in Indian and Yemenite swords, while in the Mashrafi regions, it is the white colour that is liked. Bāhilī writes in the *Kitāb al-Silāh*: "By *farand* are implied the graphic designs at the back of swords, while *barand* is that shine which has *farand* in it. Its hue is of the opposite kind. By *mushattab* is meant the sword that has stripes running like the ducts that pass through the fields, and are at certain places elevated and at others depressed".

According to Bāhilī for a duct to be depressed, this is possible only when there is one duct. If there is more than one duct obviously the even duct would be between the depressed ones.

Surayji blades are associated with Surayj which is the name of an ironsmith. Some have said that the word has its origin in *sirāj* (lamp) through diminution. But this seems to be an absurd explanation.

The *Qalā'ī* blade has association with *qala'*, whereas the Qasāsiyan sword has an association with Qasās, this being a mountain where there is

an iron mine. Some have linked *Mashrafiyah* with *Mashārīf*, these being villages in the proximity of Rīf, and which are also called *Mazārīf*. Others, on the other hand, claim that the provenance of the *Mashrafiyah* comes from the name of an ironsmith of the Jāhiliyah age. He was of the tribe of Banū Thaqīf, and his name was Mashraf.

It is said that the Yemenite *farand* (glitter) is crooked having knots of equivalent size, white or greenish on surface. The *Qubūriyah*, which are celebrated by this appellation, are possibly the swords that are found in the graves of eminent persons (of Yemen). I have heard that the *Qubūriyah* swords are the blades that have not accepted the administration of the chemicals while being melted. They, therefore, have female veins running through them, and they have not accepted the liquor. If their edges have not accepted them, they will not be sharp, since they have been deprived of dilution. But if this is not so with their edges and applies to surfaces distant from them, little harm would accrue. And the *muḥannad* swords are those that have been forged in India. Sometimes they are also associated with Serāndīb, and the name is transmogrified through Arabicisation. Ibn Ahmar says:

He fell and turned his shoulder-blade leftward as if the Serāndīb sword glitters in the hands of the burnisher.

Farand in Khurāsān is called *jawhar* (glitter); in fact, the Khurāsānians qualify it by calling it *jawhar al-sayf* (the glitter of the sword). Occasionally they hide it after heating it. If the people of India wish to display it, they polish it with the Bāmiyānian vitriol or white Multānī clay. If the Bāmiyāni vitriol were no better, it would not have been imported to Multan. At the time of dilution a good variety of clay is rubbed upon the back of the sword and cow-dung and salt in the form of a paste are laid upon it. The portion so treated is tested with both fingers at both edges. On blowing, the paste swells. Dilution is effected again. The polished portion is washed, and it manifests itself. It is quite possible that alum is incorporated with the salt.

The sharpness of *farand* and *daws* derives from their hardness. But both have the demerit of being brittle. If feminine iron is mixed in with both sides of these blades, their sharpness persists and the power to cut remains. The above defect is also removed. And this is the chief merit of a sword. No one knows about its kinds and names better than the people of India.

There is a sword having narrow designs like the passages along which ants crawl. Some have broader designs that are spread wide. These give rise to different shapes like the ones that appear in clouds, or in the water that flows on the ground. We have described these patterns in connexion with the *jaza'* stone.

The people of Russia make their swords with *shābarqān*. These

swords have stripes in the middle of soft iron. This ensures powerful strikes by their swords and makes them non-brittle. Iron cannot withstand the cold of their country and breaks while the sword is being wielded. When they saw their own swords, they devised the process of making these stripes through the use of stretched twine. They also pressed into service the native steel and the female iron. Strange designs resulted from the marking of these furrows; and this is what they desired. *Farand* is not the result of industry and design; it is an accidental product.

It would not be inappropriate here to describe what has been told me by the knowledgeable people of India regarding the characteristics of the swords (of India). The best kind, it is said, is the *pālārak* (with the *bā'* which is Arabicised with *fā'*). Good quality swords and precious daggers of these people are made from it. It is said its steel is made from a red sand which occurs in Qannawj. They melt it with crystalline borax, as subtile borax is of use only for goldsmiths. This is a liquor which, on congealing, becomes borax. The blackish colour (in the sword) is better than the white. Another variety is called *rohīnā*. This is made from Harawī *bayḍāt*. Another variety is *mawa*, and it is also made from Harawī *bayḍāt* in Multan. There are three kinds of this variety. The best kind is known as the *'imrānī*. It is almost close to the *pālārak* (in quality). Black colour predominates in it, and it is of good quality. The most inferior kind is the *harmūn*, and there are intermediate kinds between both varieties.

Yemenite swords resemble it. Close to it (in attributes) are *nilāband*. There is another kind called *Bākhirī* which has three colours. The original approximates to the *rūhīnā* kind. The other is the *makhūs* which is like *saqlātūn-makhūs* in which the *bayḍāt* is not pounded lengthwise but on the extremity so that it spreads and becomes saucer-like. It is then cut in a vise and its surface is made even on its spherical sides. Sword is forged out of it and it comes out *makhūs al-jawhar* (that is, black at certain places and white at others).

The third variety is the *Bākhirī* which includes every sword that has no glitter whatsoever. It has no attributes nor does the name incorporate any attribute. The *mujallā* kind is also like it but for the fact that it has the designs of plants and animals inscribed upon it. There are two kinds of this variety. One variety has these designs inscribed up to both sides of the back of the sword or parts of the designs on one side are carried over to the other side. It strikes well with both edges, and its price is equivalent to the price of a healthy elephant. If the figure inscribed upon it is human, it is regarded as the most costly kind.

'Amr bin Ma'dī Karab had a sword known as *Dhū al-Nūn* since it had the figure of a fish in its middle part. He says about it:

I keep *Dhū al-Nūn* with me. Below my mount is a roan-coloured horse.

And again:

And *Dhū al-Nūn al-Safī*, the beloved sword of 'Amr which braces itself against all ordeals.

The special sword of the Holy Prophet (*sal'am*), *Dhū al-Faqār*, was in the possession of Munnabih bin Hajjāj. The Holy Prophet had chosen it for himself at the Battle of Badr. All the swords forged from inferior steels are known as *kojarah*. There are circles on the bodies of horse. Some of these spherical marks are regarded as auspicious and others inauspicious. One of them is called *qālī*.

This mark is said to portend misfortune. In the same way glittering swords have black marks as if they are empty sections or segments. A glittering sword has no design. If this segment is removed, the edge is vitiated, and it is, therefore, not liked. If this black stripe runs from one end of the sword to the other, the purchasers take evil omens from it. If it is towards both sides of the sword, it is regarded as spelling an evil omen for the enemy and if towards the hilt, for the owner.

(By writing) the *Kitāb al-Suyūf* (The Book of the Swords), Al-Kindī has not done anything that would evoke gratitude from the ironsmith, Dimashqī. The latter had already installed a furnace for making steel, devised crucibles, and had chosen their sizes all by himself. He had also selected the clays from which the crucibles were to be baked. He had ordered his men to put five *ratls* horse-shoes and the nails thereof made of cast iron into these crucibles. Ten *dirhams* by weight of golden iron pyrites, antimony and soft magnesia each were to be added (to this mixture). The crucibles were coated with clay and thrown into the furnace. The hearth was filled with coals to the brim and they were heated by means of Roman bellows. Each of the bellows had two wheels fixed to it to make it mobile. The melted iron used to revolve. He also used to prepare bags having chebolic myrobalans, pomegranate peels, edible salt, and roughly ground mother-of-pearl powder. Each item weighed equally and each bag weighed 40 *dirhams*. Each bag was placed in the crucible, and the bellows were made to drive air into the fire rather forcefully for an hour. These crucibles were left to cool, and the ingots were taken out of them.

A person who had visited Sind told me that he was sitting by the side of a sabre-maker. He saw that the ironsmith had cast iron and he was spraying a chemical upon it. The chemical was reddish and very pleasing. He sprayed the chemical upon it thoroughly, and then dipped the iron into water so that the iron may absorb the chemical well. He then took out the iron, pounded it and stretched it. He used to repeat this process many times. When asked what this chemical was, the ironsmith looked

at him as if he was making fun of him. When the man reflected upon the chemical, he came to the conclusion that it was *daws* (the water in which red-hot iron has been quenched). The ironsmith was mixing it with cast iron after pounding and dilution; in much the same way iron is melted with it to yield *bayḍats*.

It has been said about Dimashqī's description that different kinds of glitter are produced in swords, and therefore, it is the old sword that is preferred and valued. Although this is beyond my comprehension. I should think this probably is due to firing, so that the addition and mixing of things change each other till such time as either the white or black colour diminishes. Or polishing may remove the light layer on the surface, revealing what is inside.

Among the absurd notion about iron is that, although it figures in many books, when Gandhāra was subjugated, an iron column was discovered there. It was 70 cubits in height. When Hishām bin 'Amr had it excavated, it was found to be 30 cubits deep underground. When he asked about it, he was told by the people that the king of Yemen, together with the Persians, had invaded the city. When these forces occupied Sind, they had this column made from their swords, saying that they did not intend to proceed beyond these cities. They occupied Sind. These tales have been narrated by persons having no knowledge whatsoever of minerals and about the feats of eminent people. The absurdity of such tales is established by the fact that the subjugator of a country needs more equipment for the prosecution of war rather than to reduce it. Wars can hardly be fought through columns (of swords).

A similar story is told about a mound of iron which has been described by those who have journeyed between Khwārazm and Ghazziyah. This iron mound is the size of a large mansion, and is slightly out of their path.

[Here, there is lacuna in the text, and the concluding part of the text on IRON and the introductory part on TIN are missing.]

TIN

This much labour and expenditure raised the cost beyond one *mithqāl* of gold and he, therefore, avoided it.

Ceruse (*isfidāj*) is made from lead, which is, in fact, its lime. When it melts, a cream deposits upon it which is scooped out with a spoon. More of it keeps on depositing and is scooped out as before. This process is repeated till the whole of the lead burns up. It is then diluted with large volumes of water when it becomes white, with a little of yellowish tinge. When melted upon fire, it becomes pistachio-coloured like the lesser

cardamoms. A poet says:

As if it is a blade made of *rasās mufaddad* (white lead), good to me
but otherwise no good.

Possibly he has implied a sword gilded with tin. Tin gilded with silver has a silver foil pasted upon it with gum. In one manuscript *nuhās murassas* has been written in place of *rasas-i-mufaddad*. This would be more meaningful.¹³⁷ God knows the best.

LEAD

Asrub is lead (*āmūk*). In Persian it is known as *usrub*. It occurs in 'Irāq and Khurāsān, whence it is exported to Rome. It is smelted from a special clay in these parts and is also mined from stones. This is why it is base and cheap, but it is held in great esteem in the East where there is no mine of the metal, and is imported from other cities.

Yahyā bin Māsaway has said it is *ibār*. Medicines are made from it and its collyria enjoy reputation. Shajarī Tāhir says: "It is known as *ibār* and *ubār* in Syriac." When the name is transcribed in Arabic, the *bā'* in the name is replaced by Arabic *fā'*. Muhammad bin Abī Yūsuf says it is with *bā'* and *alif* marked with *fath*, without the *maddah* sign. He has offered the hemistich quoted below in support of his philological claim:

Gold is (being) sold in place of lead.

The weight of a rod of lead is 50 *raṭls*. With the axis of gold as the standard, its weight comes to 60-1/8. Thawfarastus¹³⁸ in his *Masā'il al-Tabi'yah* (The Problems of Physics) says:

If a vessel is filled with molten lead, which is subsequently filled with gold and silver, the weight of lead would be found to be heavier.

I cannot accept the correctness of this statement, as, according to the weights I have given earlier, this cannot be so. If this statement is made with regard to the molten states of the three metals, it would be correct about silver but wrong with respect to gold.

He has made this statement as the molten lead would become roundish and a little air would be able to press between the interstices. When molten gold and silver are poured into the vessel, the volume of the air would decrease and the vessel will not fill; there would, therefore, be considerable space for the air. If so, he should have put the condition that the neck of the vessel should have been narrow. Even if the vessel is supposed to have two necks — one for pouring the metal and the other to serve as the outlet for the air — and is heated so that the metals solidify in the vessel, he would be wrong. Lead has little silver — a fact which can be verified on calcining it.

A statement is ascribed to Ibn al-'Āmīd that, when he extracted silver from lead, it came to ten *dirhams*, while he spent ten *dirhams* upon it.

He said he would have persisted with the process had he derived any economic benefit from it.

Abū al-Hasan Turunjī says that the *ibār* employed in optical medications is not *rasās-i-qala'ī* (tin). Nor is it natural lead; it is a special kind of lead which is clean and soft. It is known as *musā'ilh*, as it is intermediate between the two kinds.

Dross of lead is made from lead. When those who melt silver, refine calcined copper and *humlān-i-fiddah*, lead scoria deposits upon the surface like a membrane.

White lead or ceruse is made from it. Its foils are suspended in vinegar, and grapes which have been squeezed are kept in the waste left after the juice has been expressed. Ceruse forms upon the surface in the manner of verdigris. It is then peeled.

Although I have not been able to confirm this fact, yet it was narrated to me that a person in Balkh used to make sulphur out of lead, and the sulphur came out in one out of five parts. The sulphur prepared by him was taken out to different cities. When the members of his household were asked about it, they could not disclose anything more than the fact that he used to make sulphur and to send this sulphur towards gold mines.

Since lead is scarce in China, tin is used as a substitute there. It is for this reason that lead is exported to China together with other goods. The following story has been narrated by a marine trader (who had heard it from one of his companions):

We used to take goods from poor and indigent people to earn God's Blessings and Reward. It so happened that we were at a place called Ubullah and were making preparations for equipping the ship for journey to China. An old man came to us and said: "I have a request to you. Others have refused to honour it. I hope you will not deny it and I have the fullest trust in you." When I asked him what it was, he said he would not disclose it unless I promised to fulfil his request. Upon my having made a promise, he brought an ingot of lead weighing some 100 *mannās* saying: "I want you to have this kept in the ship by your men, and dropped in the sea at such and such a place." When I said I could not do this, he importuned me and reminded me of my promise. When he persisted without providing me any reprieve, I finally yielded, and entered his name, address at Basrah, and his request in my log book. When we reached the place indicated by the old man, I forgot to throw the lead ingot overboard, as there was a storm blowing there. It was willed so by God. When we reached our destination and had sold off our goods, men called upon us to buy lead. I told him we had no lead, whereupon my slave said we had it. I said: "I have no right to sell it, as I have made a promise

to the man, and I cannot break it." However, the lead was sold to the man for 130 *dīnārs*, and I purchased gifts worth that amount for the old gentleman. The old man did not call on us on our return. When I went to his house, I was told he was dead. On my enquiring whether he had left an heir, I was told a nephew of his resided at such and such place in the area and that his house was under the patronage of the *Qādī*. I was in a quandary what to do till I sold all the goods at Ubullah for seven hundred *dīnārs*.

One day I saw a stranger standing opposite men and asking me whether I was such and such person. Upon hearing my reply in the affirmative, he asked me whether I had been to China during the past year and whether I had sold a lead ingot. Upon my confirmation of this fact too, he said: "I had bought the ingot from you. When I cut it for use, I found it hollow from inside and ten thousand *dīnārs* came out of it. These I have brought as a present for you." To this I said: "You have placed me in an even greater ordeal. This lead piece did not belong to me." I then told him the whole incident. The young man, when he heard the story, began to smile with a look of amazement upon his face. He then asked me whether I knew that old man. I told him: "I know him as much as I have said." To this he replied: "He had no heir except for me and yet he used to ill-treat me so that I was forced to run away from Basrah. This was seventeen years ago. He did not want the money to come to me, but through God's wish it has come to me against his desire." I returned the seven hundred *dīnārs* to him. He went away to Basrah and to pass his life in peace and happiness at his late uncle's house. It is God Who prospers and assists.

KHĀR SĪNĪ AND STONES SIMILAR TO IT

Muhammad bin Zakariyyā Rāzī says *khār Sīnī* is like Chinese mirrors and rare. If he has called *khār Sīnī* rare, he must have called it so in relation to our cities, for if it was totally non-existent, how could it be compared with anything, and it would have been more appropriate in that case to call it *unqā* (which is non-existent bird).¹³⁹

In the *Kitāb al-Nukhab* it has been stated it is like *rasās*, both from its characteristics of melting and colour. A friend of mine has told me that in Karrān, which is between Kābul and Badakhshān, its stones are found to occur. When melted, they melt like tin and become tin-like in colour. But they are brittle, and do not accept malleability and ductility.

In a letter to me Abū Sa'īd Qazwīnī had said: "When I visualise *khār Sīnī*, my idea moves to the material from which in Kāshghar are made

bells, and in the coastal area of Ansi Kūl in Barshkhān up to the Sea of Hārah utensils and basins are made from it. These are very coarse".

This is only exaggeration, for the utensils made in China are very delicate and beautiful. It is said the (Chinese) add tin to it, which becomes the material for the Chinese mirrors.

Stones, called *murda sang*, are found to occur in Zarūban in Zābulistān. They have different shapes. They seem to be like a black thing which has been dyed with something like arsenic. They are melted and cast in moulds. These moulds or shapes are like armlets or like the hair-knots of Indian women. It is called *khār Sīnī*, and it is like the Chinese mirrors. It has more of ferrous darkness.

It is God Who prospers and assists.

PREPARATION OF BRASS AND COMPOUNDS THEREOF

Shibh is the yellow copper which is obtained from a vitriol that has been treated with different sweetening agents. This is continued till it becomes like gold and gains the name of *shibh*.

The poet, Sirī, thus says:

People begin to do work like him, otherwise where is gold and where is *shibh*?

Its yellowishness being temporary, the more it is heated the more does its yellowish hue fade, and vitriol has to be added to it afresh, otherwise, it returns to its original state.

A strange thing about *shibh* is that it does not burn with sulphur as all other minerals do except for gold. It could be that the resemblance of its yellow colour with gold saves it from calcination.¹⁴⁰ We shall describe calcined *shibh* later while discussing the preparation of flasks and *talāwih*. Its calcination is like that of copper.

Vitriol possesses a surprising property. It mixes with copper and enhances its weight. Its stoniness does not diminish its ductility. Just as the yellowness of brass is temporary, the vitriol which is added to it has the status of an addendum which does not unite with it. It is not altered either in its direction, as fire at every melt diminishes its mass and weight until all of it disappears.

The vitriol used in this connexion is the smoke of the earth and its essence. Its earth is kept in a kiln having shell-like elongated pieces. When fire is lighted and the material is heated, vitriol skims to the upper surface and fixes itself to these pieces like a membrane. It is light and weighs light like peels. Already treated vitriol increases the weight of silver as it adds to the weight of copper without making it black and does not resist braying. Thus it parts from it, as copper parts (from it).

When *shibh* comes in contact with gold, it spoils gold and breaks it

into pieces. Sulphur cannot make it part from gold, since they both undergo combustion with it when together. It remains attached to gold as an evil slave remains attached to his master. It cannot be separated also without melting polypody. Just as they both part silver from copper, they make lead saturate them. Sulphur cannot part both of them, although it burns both of them. With the axis of gold as the standard, the weight of *shibh* is $44 \frac{7}{8}$.

It is God Who prospers and assists.

ISFĪDRŪ

The word, *isfīdrū*, is a Persian word, meaning white copper. It is called *sufr* too, but it is more appropriate to call it *shibh* on account of its pallor. Abū Tammām thus says:

The excess of yellowness right and left has glorified the splendour of gold.

Abū Sa'īd bin Dūst says:

When I contented myself with a pittance, people admonished me not to extend my contentment to gold. Even though my heart is not empty of the desire to acquire wealth, yet what will I do, since I have neither silver nor gold?

It is said that *isfīdrū* had its beginning in the days of Hajjāj who ordered that all the vessels in 'Irāq and Īrān be broken and imposed strict sanctions upon wine bibbing. Fīrūz, the lord of Husayn, felt considerable distress in quaffing from glass goblets, and said that whenever he saw them, he was forced to recall the earlier days. His goblets were, therefore, made from silver alloyed with copper. Later, the silver in the goblets for him was substituted by *rasās*.

Isfīdrū is used in making food utensils, water cups, pickle-jars and wash-tubs, since it neither rusts nor collects dirt. The people of Sīstān are especially experts at their manufacture. They make them with great care and use them extensively. The Saffarī family was engaged in their manufacture and till they became rulers, they were looked down upon. Good copper is found in Sifūlah-Zanj; it does not blacken upon fire but becomes peacock-coloured. When the artisans poured (molten) copper upon it, it became *shibh*-like and malleable. It is not like *Sufr* which is non-malleable and non-ductile.

The temperament of *Sufr* is real, as they both cannot be made to part in any manner after union, and regain their original individual states. They persist together and become corrupted together.

Physicists are in general agreement that heat and fire bring homogeneous substances together and segregate heterogeneous substances.

Al-Kindī explaining this point says:

The peculiarity of fire is that it unites all the parts of mineral bodies and delimits them. If their ingredients are different from each other, it separates them, since it burns whatever it comes into contact with, within a limited span of time. Thus, if two minerals are mixed, it consumes the weaker one, and keeps the stronger one in existence.¹⁴¹

Al-Kindī further writes:

This is the belief to which Ūmānīs subscribed, and Plato's belief compelled him to believe in it, as he desired to make a coloured ingredient enter the other, so that they may both persist upon fire together and also perish together, and the mass and magnitude of the coloured body may remain equal to that of the mineral body.

This last condition shows that gold cannot be made into silver, but what we have said about *isfidrū* above is an exception. Fire does not destroy *rasās* in *isfidrū*, before copper although it destroys both together, even though the description of mines or bodies does not figure in the definition of fire.

The allusion and terminology of the alchemists denote the names of bodies by planets. This makes people lead themselves to the belief that the views of astrologers resemble their own, although this is not so. This opinion is different from that of the commonalty. They say that there is a bond of love between iron and copper in that copper is for Venus and *rasās* for Mercury. A young maiden loves a young boy and clings to him. Astrologers associate *rasās* with Venus and copper with Mars.¹⁴² There is, however, nothing common between the two except for the proximity of heavens.

The weight of *Sufr* measured with the axis of gold as the standard, is 46.5/8. I have my own doubts about it. The true figure could have been disclosed through continued experimentation, but I did not get the time for it.

It is God Who prospers and assists.

BITRŪ'Ī¹⁴³

This is brass, the reddish colour of which has been gone away with by pouring lead and mixing it. Kettles and cauldrons are cast from it. Should *shibh* be poured upon it, a pale colour begins to dominate. It is called *shibh-i-mufarragh*. Lampstands, candle-sticks and items of the toilet, e.g., tongs, closet, storage tanks, etc., and roadways, mosques and water reservoirs are made from it. If there is a *tashdid* upon the *tā'* in it, I should believe from its name that it is the worst form of brass, since it resembles rust. It is neither malleable nor capable of being heated upon fire for long.

It is also, as a matter of abbreviation, called *rūṭ* and copper is not called *rūṭ*. It, therefore, began to be called *mis*. There does not exist in it the homogeneity that characterises copper and tin, between lead and copper, since, if a mixture of the two is placed on fire, especially together with fat, lead begins to flow out and copper remains.

Alchemists associate lead with Saturn, as it is ugly and old. A slender and beautiful maid holds it in aversion and dislikes its proximity. It, therefore, drives it away from her presence and does not meet her.

TĀLĪQŪN¹⁴⁴

We come across the description of *tālīqūn* in books, but its characteristics have not been enlarged upon. I have neither seen it nor heard about it from any reliable person. It has been stated that if hair are pulled out by the tweezers made of it, they will never grow afterwards and also that if one sees his reflection in a mirror that has been made from it, he would be seized by conjunctivitis and impaired vision.

In the *Kitāb al-Nukhāb* it has been said it is made from *shibh*. The *Lapidary* says it is a species of copper, but that it was acquired through poisonous medicines and, therefore, harms blood and flesh.

Now that we have arrived here, the intention with which we started has reached its fruition and we have fulfilled what we had promised.

We now end the book with thanksgiving to God and prayer. We had begun this work with thanksgiving and prayer. It is the Beneficence of God that He has blessed His creatures who are under the shadow of the munificence of Amīr Sayyid Malik Mu'yyad Sultān Mu'azzum Shihab al-Dawlah, the axis and pride of the *ummah*. May Allāh keep his country and his Kingdom forever, as He is Almighty and accepts the prayers.

(Here ends Berūnī's text)

The manuscript ends with the following colophone:

The Book is now complete. Praised be God, the One, the Just, and blessings upon the lord of the Prophets, Muhammad, his offspring and Companions. For himself and for others Ahmad bin Siddīq bin Muhammad, the physician, wrote the glosses to this manuscript at the end of the month of Safar in 626 A.H.

SUPPLEMENT

I included this description occurring in the *Kitāb al-Aklil 'l-Hamadāni* (volume eighth) when I found in it a description of the mines of Yemen.

Yemenite Mines Hajarī and Turabī

Some of the mines in Yemen are as follows: a gold and silver mine in Jabal, a mine at Kharbah Dhī Jazb, one mine each at Ibn and Afīq, a gold mine in the upper reaches of the fields in the middle of Jarūf in the town of 'Anas, a mine of *rasās-i-aswad* in the upper part of Jaru. There is a black stone mine in the valley of Jarishshah-i-'Anas which descends towards Warqah. In the east are blackish shrubs, while when coming down towards Warqah, one comes across a mine of black stones which are like antimony. When brayed and burnt along with the excreta of domestic fowls, they turn liquid.

There is a mine in the town of Banū Ghasīn near Hashrān near a desolate tract in two rocky wildernesses. The soil of these wildernesses is pale green. Quicksilver or vinegar is added to it, and it is kept for six days in curd water and grape (juice). When cooked, it turns liquid, foam deposits upon the surface, and it froths. It is not mixed with borax: in fact, borax is poured upon it. But the addition of borax is withheld until a cock is sacrificed according to the number of the mines. A goat or cow may also be sacrificed. If the number of the mines is quite substantial, it is a cow that is sacrificed, if of average strength a goat, and, if very small, a cock.

Among the celebrated mines which yield good-quality silver is a mine situated at Radard between Khulān and Hamadān. This mine once belonged to Banū Ya'far; they used to mine silver from it. The author of the *Jazīrat al-'Arab* has said that recently the upper part of a mountain was excavated. Probably it is in the possession of Banū Nahm. Here there are some excellent *rasās-i-aswad* and silver mines owned by Banū Nahm.

To the west, in the city of Rāzī is a silver mine. Imām Sharf al-Dīn used to have it mined for silver. Probably a mountain has fallen upon it, as said by those who are knowledgeable about this fact.

There are several mines in the mountain of Naqam. There is an excellent gold mine and an iron mine from which Banū Himyarite make swords. These were also called Yara'shiyah as they had been forged during the reign of Yar'ash.

The author of the *Jazīrat al-'Arab* says:

There are mines of precious stones also there, e.g., those of emerald, jacinth, beryl, crystal and juz'. There is a gold mine at Sa'wān, as also stone mines, one of the stones occurring there being called *hajar-i-Maryamī*. The mine at Sarwāh yields good gold. There is a gold mine at Bayhān (Al-Jawf) too.

The author of the *Kitāb al-Tījān* (The Book of Diadems) has mentioned the mines at the mountain of Ablaq. These are situated near Sadd Ma'arib. Banū Qahtān, 'Ād and Himayr knew these mines and pressed

them into service. *Ablaq* is a mountain close to *Jibāl Zurq* (Blue Mountains). It is called *ablaq* as it is situated on a black ground having silver mines. It is close to *Sadd*. The dust-coloured earth has gold and the bluish earth emerald and *juz'* mines. This mountain was called *Bādhakh* also, and *Ma'arib* was designated as *Shāmikh*. *Ma'arib* is close to the mountain of *Oman*, whereas *Ablaq* is close to the sea of *Lanjah*.

Hasan Hamadānī says:

There is a mine yielding an excellent *Baqrānī* in the territory of *Alhān bin Zayd bin Mālik*. In *Jabli Abī Anas bin Alhān bin Zayd bin Mālik*, also called *Jabal Dhawrān*, are found to occur good quality old stones, e.g., '*aqīq-i-Yamānī* and *Baqrānī*'.

It is said that within the precincts of the village of *Wahm* in the area inhabited by *Banū Qushayb* is a mine and a silver mine at the summit of the Eastern Mountain. There is a silver mine in the village of *Jarbat al-Manāwā* in the valley of *Mūnā*.

Hamadānī further writes in the *Book of Jazīrat al-'Arab*:

There are *baqrān* mines in the mountain of '*Ishār*'. This stone is genuine. There are excellent Yemenite stones in the *Harān* mountain towards *Madīnah-i-Dhimār*), e.g., red, yellow and rose-coloured ruby. To the west of *Dhimār*, in the village of *Mals* occur '*aqīq-i-Yamānī* and excellent stones. This is a well known and observed fact.

An agate-cutter from among the people of *Mals* has stated that there is a mine of good-quality emerald at *Bald Zubayd*. The people, when they discovered this mine, however, covered it with mountain rocks in order that the adjacent tribes may not launch attacks upon them.

Gem-cutters say that there are several mines in the region of *Bart*. Many of these comprise *rasās-i-aswad* at many a place. The mineral from these mines is high-quality, firm and clean. Besides, there are gold and silver, white and golden-coloured pyrites, and other allied stones and mines. The area of the *Sa'adah* has iron mines. The iron in these mines is found admixed with earth and people refine it having taken it to *Madīnah Sa'adah*. However, iron in greater abundance is found in the area of *Banī Jamā'ah*, while the best kind is to be found in the city of *Bāqim*. This city also has the *Hinduwan* mine, while *marcasite* is to be found more abundantly in *Syria*. Iron and silver mines occur in the fortress of the *Dahr Valley*.

Hamadānī writes in his book:

Banū Ya'far used to bring silver from *Shabām Sakhm* to *San'aa*. It is situated at a journey of two hours from *San'aa* and is close to *Dhī Marmar*.

This would indicate the presence of a silver mine there.

A jurist said: "I located a gold mine in the mountain of *Sibr*. I took out gold from there, but it was very difficult to extract it." Probably he

could not treat the ore properly. There are several mines in Ma'āfir (upper and lower Yemen), but we have not been able to get any information about them.

A silversmith has made the statement that he saw a silver mine above Madīnah Jabalah and a *rasās-i-aswad* mine at 'Adinī Pass. He also said that there is a copper mine in the mountain of Banū Sabā facing Dharbat 'Umar and in the summit of Naqīl-i-Samarah which is close to the (area inhabited by Banū Sayf). He claims to have taken out copper from there. It is close to the path that descends towards Banū Sayf. A site known as Hawbar Qafr Hāmid 'Utmah has a gold mine, while there is a silver mine in the city of Samāh. There is a gold mine at Masār in the area of Hirāz. There is a mine of good quality red copper at Dhīmār al-Qarn, and likewise there are two mines at Ridā' and two gold and iron mines at Al-Qanī. Copper is found in the mine at Al-Baydā'.

The following statement occurs in the work of an unknown author:

Different minerals occur between Bīshah and Dhīmār. Twenty-five mines among these are celebrated, but only six of these are functioning well. One is in Najrān, the second is Sharas at the place which is called Farwat, the third at Misahar in the neighbourhood of Hijrat al-'Arūbān, the fourth in the city of Banū Shaddād (it is called Kuhāl), the fifth in Radmān Banī al-Nimrī at place called Qanfir, and the sixth in the mountain of Al-Akhram which is situated in Sarī'. This is the best. Its depth up to eighty cubits has been scaled and the width of the mine has not been taken into account. Being moist, it does not require any chemical treatment. We have been told about another mine here. It has been said to have hard gold required in laxative medicines.

A mine has been discovered near Yanūf al-Qifāf, situated near the region of Ahnūm to the north of the village of Hujr. This mine was manifested during the time of Imām Sharf al-Dīn. His son, Sharf al-Dīn bin al-Imām, had gold taken out from here. The gold is genuine and the mine in quality compares with that of Akram.

It is claimed that there is a village in Sarī', called Sawād. There is a place by the name of Banī Sa'id in which is located 'Uddat al-Za'lā' facing the place known as Maqtāl. It yields a variety of gold that is extremely pleasing to the heart.

It is said that to the east of Jabal al-Sulb, sun-coloured (earth) predominates. There is another place known as Judrah, situated to the west of Jabal al-Sulb. Here there is an excellent silver mine.

Among the places that are well-known, one which is also called Al-Rukkan is to the eastern mountain of Uns. The most famous place, however, is that of Al-Tayr which is situated near the tribe of Al-Imām 'Alī bin Muhammad Abū Salāh bin 'Alī (may God keep his works extant).

One mine is situated at Thawbtayn. (The mine of this place has been mentioned in all the manuscripts without dots). One is situated in the bushes of Banī al-Aqra'ī at a place known as Sahr to the south of Fadrah. It is so beautiful that the heart is pleased with it. One valley is situated at the place where the valleys of Marham and Sayhān join near Jawf. Bedouins and others living close to it know about it. These are the places which at present exist in my mind. There are also other mines, which need not be mentioned.

Relieved from writing on Monday, 25th *Dhī al-Qa'dah al-Harām*, 1112 A.H. This is the writing of the most humble of God's creatures, 'Alī bin Yahyā bin Jābir al-Khayshnī al-Mikhlaḥī, the servant of God and seeking redemption through the Messenger of Truth, Muhammad, and his pious offspring.

The End of the Book Through the Assistance of the
Sovereign, the Munificent.

NOTES AND REFERENCES

1. Original **ترويجة** – a pause, a stop for presenting a new idea. These are the sub-sections through which the introduction has been developed into a systematic whole.
2. *Sūrah Yāsīn*, XXXVI: 71–73.
3. *Sūrah Al-Zukhruf*, XLIII: 13.
4. *Sūrah Fussilat*, XLI: 53.
5. *Sūrah Al-Mulk*, LXVII: 3–4.
6. *Sūrah Yūsuf*, XII: 105.
7. *Sūrah Al-Isrā'*, XVII: 36.
8. *Sūrah Yūnus*, X: 43.
9. *Sūrah Yūnus*, X: 42.
10. *Sūrah Al-A'raf*, VII: 189.
11. *Sūrah Al-Rūm*, XXX: 21.
12. *Sūrah Al-Hijr*, XV: 19.
13. *Sūrah Al-Baqr*, II: 180.
14. *Sūrah Al-Qalam*, LXVIII: 12.
15. *Sūrah Al-Ādiyāt*, C: 8.
16. *Sūrah Al-Hadīd*, LVII: 20.
17. *Sūrah Āli 'Imrān*, III: 14.
18. *Sūrah Al-Tawbah*, IX: 34.
19. 'Isām was a chamberlain of Nu'mān bin Mundhir. He was of low extration but was possessed of high merit. An 'izāmī, on the other hand, is one who basks in the fame of his ancestors. That is, to be great on one's own excellence.
20. *Sūrah Al-Takāthur*, CII: 1–2.
21. *Sūrah Al-Baqarāh*, II: 264.

22. *Sūrah Al-Rahmān*, LV: 22-23.
23. *Sūrah Al-Nahl*, XVI: 14.
24. *Sūrah Al-Rahmān*, LV: 58.
25. *Sūrah Al-Mā'idah*, V: 6.
26. *Sūrah Al-Mudaththir*, LXXIV: 5.
27. A festival of the pre-Islāmic Arabia.
28. That is, Sultān of Ghaznah.
29. The allusion is to *Sūrah XLIV – Al-Dukhān* (Smoke), v. 10.
30. The reference is to *Sūrah XVIII – Al-Kahf* (The Cave).
31. *Sūrah Al-Nisā'*, IV: 119.
32. *Sūrah Yūsuf*, XII: 76.
33. *Sūrah Al-Rahmān*, LV: 58.
34. *Hurf* is the cress plant. It is different from mandrake. Possibly there has been some lexicographic change during the millenium that has elapsed.
35. That is, 12,240 grains troy.
36. One *dāniq* = 0.55 g.
37. That is, 1.5625 g.
38. This would be the dragon's blood.
39. That is Ptolemy, the author of the *Almagest*.
40. *Qirmiz* (kermes) is an insect produced upon the kermes-oak and employed in the red dye.
41. *Qasīdah* – Ode.
42. That is, *Phaseolus radiatus* Linn.
43. The pea.
44. This would be the *kulthī* of today – *Dolichos biflorus* Linn.
45. The reference is obviously to the East Indies.
46. The Patronym should have been *Thaqafī*.
47. The text has *بهنو*: correction is from 'Al-Berūnī's India'.
48. A weight of two grains of barley or twenty-fourth part of a dram.
49. That is 0.55 g.
50. That is, one who deceives in the way of the wolf.
51. The meaning of the verse thus becomes: "My verses glittered upon thy door, as the jewels glittered upon Khālīshah."
52. The *Jabal* ring was in the treasury of the Abbāsīd Caliphs till the reign of Al-Muqtadir bi-Allāh. It then passed into the hands of the Buwayhids, from whom it was taken by Tughrul Bak the Suljūq. He gave it to the daughter of Al-Qāsim as dowry in A.H. 451. Before this it belonged to Abū Nasr Ahmad bin Marwān the Kurd, whose descendants were from the family of Malik Mansūr bin Abī Tahir Buwayhid. (*Al-Muntazim* of Ibn al-Jawzi).
53. The incident can be intelligible only if we take Abū al-'Abbās to be the patronym of Fadl bin Rabī'.
54. That is 9 lbs.
55. That is, 1,350 grams.
56. The original Arabic is *la abā laka*, an expression of endearment among the Arabs.
57. That is, chariots.
58. One *farsang* equals 12,000 cubits.
59. *Sūrah Al-Furqān*, XXV: 72.
60. *Sūrah Al-Furqān*, XXV: 63.
61. *Aflah* means chapped.
62. A coarse blue gem said to prevent intoxication or to induce pleasant dreams.
63. A fruit resembling the colocynth.
64. The present-day Jalandar (or Jālandhar or Jalandhar).

65. That is, Sultān Mahmūd of Ghaznah.
66. The text has Abu Sa'd which is probably a corruption of Abū Sa'īd has been quoted by Al-Bayrūnī in his writings.
67. *Khurdād* is third Persian month.
68. This is, α 'ῥῥαμα'ω (adamant).
69. 'Abqar is the name of a solitary place where demons are supposed to dwell, and to which in Arabic literature is attributed everything that is choice and wonderful.
70. That is, dates cooked with flour and butter.
71. Situated in district Jhelum, Pakistan.
72. *Smyris*.
73. That is red sulphur or brimstone.
74. *Sūrah Al-Rahmān*, LV: 58.
75. *Sūrah Al-Rahmān*, LV: 22.
76. A perfume-box; musk; a market where perfumes are sold.
77. This couplet is by 'Antarah bin Shaddād, a pre-Islamic poet. In his *Diwān*, however, *du'ā*, occurs in place of *bukā* and *badarat* instead of *dhurufat*. In the glass it has been pointed out that it is surprising that Berūnī should have read *jummanah* in place of *hammamah* (pigeon or dove). One could apologise on behalf of Berūnī by pointing to the fact that he has quoted this verse because of reference to tears in the manner of Imr'al-Qays who has in the preceding verse used the expression, *raqraqah al-munhadir*.
78. *Sūrah Al-Saffar*, XXXVII: 49.
79. *Sūrah Al-Dahr*, LXXVI: 19.
80. *Sūrah Al-Tūr*, LII: 24.
81. The Qadi of Basrah (d. 122 A.H.).
82. A kind of grain resembling cherry-stones growing in Adharbijān.
83. *Sūrah Al-Qisas*, XXVIII: 40.
84. *Sūrah Al-Qisas*, XXVIII: 7.
85. *Sūrah Tā-hā*, XX: 97.
86. Bahr al-Akhdar is the Caspian Sea. The description here is, however, ambiguous, and possibly the Arabian Sea/Indian Ocean is meant.
87. The day on which the sun enters the Aries.
88. *Kawsaj* is the sword-fish.
89. *Sūrah Al-Noor*, XXIV: 35.
90. *Sūrah Al-Duhā*, XCIII: 6.
91. In Persian *Akhdar-i-Talkh* (Sour Green).
92. That is Amīn al-Rashīd 'Abbāsī since the *bay'ah* with him had made null and void.
93. This has been also said by Nasībī in refutation of Abū Bakr Zakariyyā Rāzī in the *Kitāb al-Balaghim*, which is a theological work. Mashhūr Qaramatī also experimented upon it, but Al-Bayrūnī experimented upon it to the full. Many such beliefs have been proved to be false. (Gloss).
94. One *awqiyah* = 33.8 grammes.
95. The *Lapidary* is an apocryphal work attributed to Aristotle.
96. The word, *mīl*, here was used for devoting a bodkin.
97. That is, *Selene* (moon). *Aphros* in Greek means the foam. Hence Aphrodite (Venus) means foam-born.
- 98-99. *Sūrah Al-Saffat*, XXXVIII: 46-47.
100. *Sūrah Al-Dahr*, LXXVI: 16.
101. This would be quartz which comprises massive hexagonal crystals.
102. Plutarchos or Plutarch.
103. *Gloss.* — *Marjān* is soft before ripening and hardens upon ripening. This is prob-

ably what Rāzī means: That it is soft before it ripens, and this is also probably what Dioscorides means.

104. Muhammad bin Ahmad Khatīb Dariya says that there is a valley in the mountain of Salihayyah near Damascus. There is a place called Tall al-Shaykh there which has a site known as Bayt Buqrāt. He and other used to pick *marjān*, etc., there. (Gloss).
105. That is, about 5,040 grains troy.
106. That is, Abu Hanifah al-Dīnwarī.
107. *Jamast* or *Jamist* is a coarse and blue stone.
108. A kind of jasper or agate; one particularly which, according to Castellus, comes from China or India, and has the property of diverting lightening from any place where it is laid, or from any person who wears it.
109. This is also jasper, especially of the whitish kind found on Mount Imāus.
110. Today *Shalājīr*, however, is taken to be storex.
111. The mss. readings are not clear, but *Nahrwālah* can be referred particularly with reference to its being situated to 'the south of Sind'.
112. Seems to be a mistake by the scribe. From what follows the correct figure should be '180 dirhams'.
113. A kind of hard stone which when brayed and dissolved in water makes a reddle for sealing. Some hold it to be the agate.
114. Situated in the Province of Ghazni (Afghanistan), Parwān being a town in the vicinity of Ghazni.
115. *Sūrah Al-Nūr*, XXIV: 35.
116. *Sūrah Al-Naml*, XXVII: 44.
117. *Sūrah Al-Hijr*, XV: 19-20.
118. *Sūrah Al-Rād*, XIII: 17.
119. *Sūrah Al-Baqarah*, II: 26.
120. In one mss., someone has written the following gloss: "The meaning is that *isrinj* (lead) is also called *zanj far*, just as the product of *kibrit* (sulphur) and *zaybaq* (mercury) is called *zanj far*. There again the word, *Rūmī*, is added as a prefix to the product of sulphur and so as to emphasise its superiority over lead, and the compound is spoken of as *zanj-far-i-Rūmī*. What is not designated as *Rūmī* is made from sulphur and lead. It is called *isrinj*.
121. Majarīf in the *Rutbat al-Hakīm* (The Place of the Philosopher) writes that there is only mine of quicksilver in the world in Spain. He saw this mine and the particles of mercury in the sand of the mine. The quicksilver of the mine in Spain is not good. Galen and Dioscorides believe it to be an artificially prepared object. Rawsam, or Rosham, of ancient Egypt who wrote on Kimya in his *Kitāb al-Masāhif* (The Book of the Books) has copied that it is adulterated, and is made from lead and tin. There are three things which would establish its genuineness (i) If mixed with a cotton cloth it should leave no trace (ii) If it changes when vinegar is poured upon it or gets rusted, it is not genuine (iii) If the water is poured upon it and if it alters or becomes turbid, it is non-genuine. (Different glosses).
122. *Sūrah Al-Isrā'*, XVII: 93.
123. *Sūrah Al-Tawbā*, IX: 34.
124. *Sūrah Al-Insān*, LXXVI: 16.
125. *Sūrah Al-Insān*, LXXVI: 21.
126. Greek *Khalkos* (copper).
127. *Sūrah Al-Rahmān*, LV: 35.
128. *Sūrah Al-Dukhān*, XLIV: 10.
129. *Sūrah Al-Rahmān*, LV: 37.

130. *Sūrah Al-Kahf*, XVIII: 96.
131. *Sūrah Ibrāhīm*, XIV: 50.
132. *Sūrah Al-Rahmān*, LV: 35.
133. *Sūrah Al-Hadīd*, LVII: 25.
134. *Sūrah Adh-Dhāriyāt*, LI: 22.
135. *Sūrah Saba*, XXXIV: 10-11.
136. *Sūrah Al-Nahl*, XVI: 81.
137. This much portion (under 'Tin') has survived only in the Top Kapi Serai manuscript. It is missing in the other two manuscripts.
138. Theophrastus, the Greek biologist and Aristotle's successor at the Academy.
139. Gloss – Rāzī has written in the *Ilal al-Ma'ādīn* (The Causes of Mines) that another thing like tin is found there. It is called *Khār Sīnī*, and because of its rarity, the description of this stone has been ignored. It seems that this description – that it is like Chinese mirrors – has been copied from some other book by Al-Rāzī. In another gloss it has been stated: "This statement by Rāzī that it is rare is probably in imitation of his (Rāzī's) statement to the effect that it is rarely found. In the *Kitāb al-Suffuh* he has said: "It is the first among the thirty-two and he has described bodies, followed by the statement that what is rare in *khār sīnī*." In another gloss it has been stated: "I was told by Abū Bakr bin Dallāl Munajjam that it is a flower (of sulphur) used by the manufacturers of gunpowder." It is surprising that Rāzī should have called it non-existent, although the homes of both are close to each others.
140. Gloss – On seven Jābir writes in the *Kitāb al-Ramzāh* that to the copper which has been made yellow with olive oil, is added silver in equal weight, followed by the addition of gold. From this passage it might follow that *Shibh* mixes with silver and, getting mixed with it, does not break it.
141. Gloss – There are mineral bodies which, however, do not unite with each other, as already stated by Jābir in the *Kitāb al-Tarjumāh*. Al-Kindī's statement is not universally true – Muhammad bin al-Khatīb. Another gloss: It seems that what he has implied are the ingredients of the body and the unit; e.g. if the constituents of gold and silver are diffused, they are united by melting.
142. This is Abū Rayhān's view. Al-Kindī has not said so. There is a belief among alchemists that Jupiter is for tin and Mars for iron. But no alchemist would say that Mars is for *rasās* or that copper is for Mars. It may be that what Abū Rayhān has said might denote the idiom of certain people.
143. Also called *tibrūyah*. Its ingredients are parted by fire. This is not so with *isfīdrūyah*.
144. Also *talqūn*. It is a species of poisonous brass or mixed metal, composed of iron, antimony, lead, gold, tin, and silver, of which tweezers are made for pulling out hair, which never grow afterwards, or at least but slowly. It is possibly a Greek word.