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DIAMOND METEORITES BETWEEN SCIENCE AND LEGENDS WITH REFERENCE TO HYPATIA STONE

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ABSTRACT:

The diamond received human beings interest much early in history as they imagined that it resembles haven in its sparkling sight. Then, they speculated that the source of diamond occurs in heaven. But how it reached earth's surface? Their hypothesis, which called now legend, says that Adam brought it when God expelled him from the garden. The story must explain its occurrence in sand and gravels along river banks, so it adds notation elucidates that the diamond fell from Adam's hand to the river. The myth opposite team, on the other hand, denouncing asked: but Adam brought one piece of diamond, while plenty of masses occur on the earth's surface, the answer was ready: there were countless of Adams, not only one Adam! But not much people satisfied that there was more Adams. In response to that criticism, the legend team suggested that diamond is a living creature grows, marries and produces analogies. When the opposite team refused the story, the legend guardians engaged in deep thinking, directed them to create an interesting imagination indicating that diamond pieces fell from heaven like other natural phenomena; such theory will survive along human being living the earth!

Science did not eliminate the celestial source of diamond's legend, but rather provides results indicate that it contains seeds of truth, when it revealed the existence of tiny grains of diamonds in meteorites. It is true that the traced diamonds in meteorites are microscopic, but

that is not an indubitable certificate on the absence of macroscopic grains of diamond. This in fact has finally verified, from studying the extraterrestrial material named “Hypatia stone”, which assembled of visible diamond grains and crystals. Hypatia stone is a small chunk of suggested large celestial diamond body stuck the ground in southwestern Egypt from nearly 28 m.y. ago and created the gem quality material called the Libyan glass. This discovery, which reconsiders the legend of the celestial source of diamonds, confirms the precision and creativity of the suggestion that carbonado is of extraterrestrial source.

KEYWORDS: legends-adamas-elmesu-elmeshu-diamond-heaven-meteorites-Hypatia stone.

INTRODUCTION:

Diamond is one of the most precious of all gemstones and the most desired. It has been called the king of gems the gem above all other gems, the master of all of them, the prettiest product of nature and the most powerful stone with the greatest influence in human activities. It exists in many colors from milk white to dark black, from transparent to opaque, from pure elementary mineral to mixture of different minerals (carbonado), from well-crystallised to massive without an apparent form, from regular shape to irregular forms. Most used as gems are the colorless and transparent types of diamonds, Tappert, and Tappert, (1911). Earlier history of diamond explorations and utilization has permanently been bounded with doubt. The sporadic data spread in the different literatures provide no authorized information regarding these questions: when and where diamonds were first recorded? There is circulated knowledge considering India as the first country to know diamonds, while others refer to Egypt (Ball, 1950). On the other hand wide range of writings point to Greeks, who appeared much late in the course of long history! One may doesn’t pass the fact when expresses his suggestion that Babylon knew diamonds before any other nations, despite reading the history of diamonds uses reveal controversy information. Kay (1908, p. 10), consider that “the history of the diamond dates back many hundreds and even thousands of years, and it was probably known of and prized among the other gems in use during the ancient Babylonian civilization, 6000 to 7000 B. C. Diamonds at that time, however, were not as greatly prized as articles of ornamentation on account of their extreme hardness and the inability of man at that early date to find a means of cutting and polishing this stone”.

Petri, (1884, p. 91-92) experimented beryl and sapphire in making cut through piece of diorite, to find that the deepest scratches with either of these stones on diorite are only 1/10 of the depth of ancient cuts on the same piece of rock. Then he suggested that diamond was used in ancient Egypt and Babylon, as he states: “My own conclusion, therefore, is in favour of diamond having been used, though the evidence is not distinct enough to press such an opinion”. He also adds that: “Hence it might be known as a stone for use, though not for ornament; and I understand from Mr. Boscawen (Assyriologist William Saint Chad Boscawen 1854-1913), that the early Babylonian inscriptions mention the "piercing stone, "a name known to be employed for the diamond in later times; so that the very early statues in diorite lately found in Babylonia, which are of the finest work, (like the splendid diorite work of the earliest Egyptians) may have been very possibly graved with diamond”. The statement of the Prophet Jeremiah (B. 650 B. C.), refers to diamond attached to iron tool for engraving (Peake, 1910, p. 220), as it says: “The sin of Judah is written with a pen of iron and with the point of a diamond: it is graven upon the table of their heart, and upon the horns of your altars; whilst their children remember their altars and their Asherim”. This statement represents evidence of using diamonds in engraving in ancient times, such evidence has been confirmed by the recorded fine etching on tough rocks, such as breccia Verdi in Wadi Hammamat Eastern Desert of Egypt. It far from consider that corundum pin can produce such fine engraving. The used tool could has originally fine tip, a feature hasn’t occurred in other natural material except diamond, in particular the type which called by Pliny siderites.

The source of diamonds is a topic of interest and heated debate even in the present days. Most circulated ancient traditions refer to diamonds as a heavenly gem fell to Earth through different ways. Perhaps the diamond mode of occurrence in sands and gravels, along river courses or in dry valleys without definite known terrestrial sources, was a reason to believe that it came from the sky. However, in eighteenth and nineteenth century this mode of diamond occurrence drives scientists to speculate that diamond formed from vegetable secretion as Paxton (1856, p. 8) indicate: “The Diamond has never been found in rocks, as are all other minerals, but only in gravel and mud conglomerations in beds of rivers, in deep ravines on the slopes of mountains, and in cavities and water courses on the summits of, sometimes, the loftiest elevations; and hence it is believed to be the product of vegetable secretion. This supposition is confirmed by the results of the experiments upon it, which seem to demonstrate it to be pure crystalized carbon”. Bauer, (1904) during his reviewing the scientific theories introduced to explain the origin of diamonds indicate that the celebrated

physicist Sir David Brewster (1781- 1868) is the first who expressed the opinion that the formation of diamonds was due to the vital processes of plants, a hypothesis received wide confirmation from leading scientists at that time. From the surprising notion in this concern, the distinguished botanist and paleontologist Gőppert (Heinrich Robert Goeppert 1800-1884) emphasized that he detected plant remains in diamonds.

While scientists engaged in emerging the hypothesis of diamond formation from organic materials, the celestial source of diamond moved to the science realm, after carbon and diamonds were reported in meteorites in 1846 when Haidinger described a cubic form of graphite in Magura meteorite, which later on, in 1863, Gustave Rose suggested that these crystals are pseudomorphs after diamond (Farrington, 1915). In 1867 rising to light the occurrence of diamonds in river gravels in South Africa. Few years later, researchers located diamonds within volcanic rocks designated kimberlite (from Kimberley in South Africa), Lewis (1887). The discovery of diamond-containing volcanic rocks in South Africa guides to realization the effects of heat in transformation the plants remains to diamonds. However, the acceptance of the terrestrial source of diamonds, disrupted by subsequent discovery of diamonds from the iron masses of the Canyon Diablo huge iron meteorite, Arizona. Accordingly, the source of diamonds fluctuates between terrestrial rocks such as kimberlite and related rocks and meteorites (heavenly source).

While nearly the largest number of researchers denies the existence of heavenly diamonds comes to lights the discovery in 1996 of a pebble-seized diamondiferous material (Barakat, 1999) of extraterrestrial source (Belyanin, et. al, 2018). This material, which contains macroscopic grains (Barakat, 2019) and well developed octahedral crystals, represent fragment of a huge celestial diamond body landed the southwestern Egypt and responsible for the formation of the Libyan glass material (Barakat, 2018). In the meantime, the extraterrestrial source of Carbonado has been strongly suggested, as it is recommended that it formed from carbon-rich, diamond-bearing stellar bodies that were transported to Earth by meteorite about four billion years ago, (Haggerty, 1996, 2014, 2017).

It is behind the scope of the present work to touch the origin of diamonds, a much complicated subject, but it aims to review some of the available legends regarding the heavenly source of diamonds. In the meantime, the present work refers to the Hypatia stone and introduces new records getting from detailed investigations of the hand specimen as well as the scanning electron microscope images.

ADAMAS NAME SOURCE:

When one reads the circulating writings covering the diamond history, he finds the following information: the diamond's name is the Greek word adamas, meaning unconquerable; from the same root spring our words adamant and adamantine. Diamond in the English, and Diamant in the French, are together synonymous with adamant, which comes directly from the Greek meaning literally the "untamable", the "unconquerable". But when did diamond get this luxurious and pronounced name? Nobody knows with a realistic degree of certainty. Theophrastus, mentions adamas, in his book "history of stones" written around 315 B.C. Theophrastus, clearly gathered considerable portion of his work from previous writers on gems, including Babylonian writers as he usually satisfied to state "they say" (Adam, op. cit). Pliny the Elder (Gaius Plinius Secundus, AD 23–79) refer to diamond as "adamas" without discussing the source of the name, indicating that he uses the designation given to diamond by previous authors as Theophrastus.

However, later on, authors introduced imaginary source of the name, as they proposed that the name came from Latin word meaning durable in referring to the hardness of diamond! However, a deepest investigation, in light of the brilliant treasure provided by the "Oriental institute of Chicago" under the title "The Assyrian Dictionary of the Oriental Institute of the University of Chicago (CAD)", indicates that the source of the word is the Akkadian "Admu" and its derivations (adamatu, adammu, adamutu, etc), which designates noble persons, colorful materials, such as, garments, plant, ornaments, dark-red color etc (Roth, 1964). "Adamu" was also used as a person names as "Adamu" is the second ruler of the Assyrian Kings recorded on the tablet of Khorsabad, which was found at the site of ancient "Dur Sarrukin", Khorsabad, as a result of the excavations carried out by the Oriental Institute of the University of Chicago in the season 1932/33 (Poebel, 1942).

In the same time, the Akkadian word "elmešu" refers to a sparkling, brilliant precious stone, like light of heaven and shine like fire (Oppenheim, 1958) indicating that the word means diamond. Pinches, (1908, p. 70) give the view that elmešu refers to valuable stone. Elmešu stone is a holy stone in ancient Mesopotamia, and attains the general mythological features credited to diamond, as Gilgamesh treat with it with extreme caution, as he says: "I changed the location of the mesu-tree (and of) the elmesu-stone, and did not reveal it to anyone", which expresses the highly value of the stone (Dalley, 2000, p. 291). In the same time the Akkadian word "elmeshu" and its synonym word "elmesu" is the source of the present day Arabic names of diamonds "elmas, almas, elmash, almash". However, writers who unaware

with the original source of the words say that the Arabic word “elmas/almas” derived from the Latin word “adamas”, while the reverse is the accurate.

DIAMOND FROM HEAVEN:

Inquiring legends, myths, traditions and folktales, reveals that the sky has been regarded as being made of gemstones, in addition to iron and stones, as Metevelis (2000) specify. However, this thought which seems as a primitive view, hadn't created from nothing, but it may partially originate from observing the blue color of the sky, which resembles the clear blue color of definite verities of gemstones, such as turquoise, a widely distinguished gemstone between nations. In addition, highly prized gemstones, such as, peridot can be also located within the fallen stones from heaven. Then, the connection between gemstones and heaven may exhibit practical observations. Human beings have observing the sky, watching what is falling from it, and what are occurring in the fallen masses. Locating these pretty grains in the meteoritic bodies, might be initiated the ancient people concept that the sky is made of gemstones.

Pliny the elder refer to a variety of diamond called siderites, which shines bright as steel, whence its name assigned. Writers, e.g. Adam (op.cit), consider the word refers to magnetite not real diamond. But, magnetite may resemble diamonds in its shape, while it is differed in its dull-brownish color and its luster which is dull gray. The Greek word sideros, which it has been suggested that it is derived from sidus (star) came into use long after the iron smelting had become established in Greece, and the word could equally well means bright or shiny (Craddock, 1995). In the meantime, the Akkadian word “šadû” and its relatives such as “saddu, šaddû” refer to lapis lazuli, heaven and precious stones (Reiner, 1989). In addition, the Akkadian word "sudāru” and its relatives such as “sedēru, sadriš”, refers to natural phenomena, such as meteor, rains etc., connected with heaven (Reiner, 1984). So, it reliable to suggest that the name siderite refers to definite type of diamonds, its color and shape resemble the sight of the distant stars in heaven. It is equally also to suggest that the name refers to the heavenly source of this type of diamonds. A crystal of nearly 2-cm of octahedral diamond was found inside Hypatia stone, confirms the characters of siderites as will discuss later.

The bible traditions, indicate that the heavenly garden is made up of precious stones, including diamonds, as e.g. Gaster, (1899, p. 18) express: “God created ten canopies for Adam in the Garden of Eden, and all of them were made of precious stones, of pearls and of

gold. Each bridegroom has as a rule but one canopy, a king has three, but in order to show great honour to the first man He made ten canopies for him in the Garden of Eden, as it is said, 'Thou hast been in Eden, the garden of God; every precious stone was thy covering, the sardius, the topaz, and the diamond, the beryl, the onyx, and the jasper, the sapphire, the emerald, and the carbuncle, and gold; the workmanship of thy tabrets and of thy pipes (was prepared) for thee on the day when thou was created'. These represent the ten canopies. The angels were beating their timbrels and dancing to the pipes, as it is said, 'The workmanship of thy tabrets and of thy pipes". Kozminsky, (1922), refer to a folktale saying that the fifth Heaven (the Garden of Delights or Jannat al-Naim) is composed of the purest types of diamond. On line with these folktales, an old legend of the Caucasus Mountains states that diamonds are the solidified tears of a youth Lord of the World. It has also stated that in Scandinavian mythology, amber, pearls, precious stones, and precious metals are the solid tears of the goddess Freyja, (Adam, po.cit, p. 233) and the Singhalese legend bearing that the gems of Ceylon are the solidified Adam's tears (Adam, op. cit, p232).

Charubel [John Thomas 1826–1908], (1906, p. 299-202) consider diamond as light, just light, as he discusses a piece nice poem referring to diamond as light. He states: "This poem I take for my text, on which I found a few remarks such remarks as will prove suggestive at least, although they may not be considered scientifically. In the first place the source of the Diamond is light. It came from a realm of light.. It originated in itself... It is, in fact, elementary light. It was in the domain of this divine luminosity that the Diamond became compressed into the hardest of substances. It has no sympathy with artificial lights of any kind... It is not pure carbon, as stated by chemists. It is as far from being carbon... and although the hardest of substances, it is not a metal, nor can it be defined as a stone. In the meantime, it is a gem or jewel of the highest significance and of tremendous importance. It came to this earth from the upper and outer mundane spheres, governed by the laws of gravity. At the same time, there were "Strange Winds" or influences from intelligences, by whose agencies these star-like gems were scattered abroad. They fell to the earth, but not as meteors fall, for the Diamond is not a meteoric stone, as it comes not from a meteoric source. "A luminous ether Divine, Enfolded this earth with its span… The Diamond is a gem, by virtue of its homogeneity, and belongs to the domain of the true life! This is a revelation that he never before been made known to this race! Hence it follows that the Diamond is sacred, one of the most sacred: yes, the most sacred of all gems. It is sad to think of it being handled so irreverently, and even profanely, by mere vulgar men of the world, whose portion is in this

life. The Diamond has a power, when in the possession of Kings, Monarchs, Presidents of Republics, Princes, Lords, Nobles, Legislators, and Judges in the Courts of Law, Magistrates, and all State Authorities; also very advanced Occultists, or those who are entitled to the degree of adept ship. But no army officer, or naval officer, or professional slayer of men or animals, nor should any instrument such as swords, daggers, or any instruments which but represent those intended to kill, be ever decorated with the Diamond. I am not allowed to give Word and Sigil for this gem".

Howard Schwartz in his enjoyable book entitled "Tree of Souls: The Mythology of Judaism" shed light on a nice Jewish folktale indicating that Adam brought diamond from the Paradise. The folktale, says: "While Adam lived in the Garden of Eden, he could have anything he wanted, with, of course, one exception-the fruit of the Tree of Knowledge. So when Adam sinned and it was necessary for God to expel him from the garden, God was reluctant to drive him out. Instead God gave Adam a good meal, with the finest foods and wines, and God said, "You know, there is a world outside this garden. Don't you want to explore? Adam didn't really want to go, but God said, You can take anything you like with you, whatever you desire, but you must go. Then God showed him all the treasures and hidden things in the garden, and Adam looked at everything, gardens and orchards, animals of every kind, treasures of gold and silver, and many kinds of precious stones, but Adam didn't find anything he wanted to take with him. Then he arrived at a treasure of diamonds. The diamonds were exceptionally beautiful and shone as brightly as the sun, and Adam chose one of the largest ones. Holding that diamond in his hand, Adam went in the direction of the gates of Eden, with an angel accompanying… he continued on his way until he reached a river. While he was standing there looking at it, the angel pushed him from behind, and the diamond fell from his hand into the river. Adam cried out to the angel, why did you do that? And the angel said, Go down to the river and find your diamond. So Adam went down to the river and saw thousands and thousands of diamonds reflected in the water and he couldn't recognize which one was his. Then the angel said, do you think that you were the first one who was expelled from the Garden of Eden and took a diamond with you? Thousands and thousands did as you did, and their diamonds fill the river, as you can see", Schwartz (2004, p.).

Legend of the diamond valley (e.g., Laufer 1915) may reflect the heavenly source of diamonds. The legend which spreads along different nation tongues with different elements added to or rejected from its main core, indicates that diamond occur in a deep valley somewhere gardened with dangerous snakes. Peoples who aimed to get diamond pieces from

that valley created a clever way, to get them without being harmed by the dangerous snakes. The people dropped pieces of flesh above the diamonds in the great valley, and then birds came to carry flesh with the fitting diamonds. Accordingly, the birds transported the diamonds outside the valley to be available for persons. The questions: why diamonds occur in one place (deep valley or High Mountain in other version of folktales)? The answer may gain from knowing that the people keeping in their mind that diamonds dropped from heaven since remote ages ago! Also the connection between diamonds and snakes says something about heavenly source, and the birds that carried flesh with the fitting diamonds and dropped their bearing from the air on the ground!

There is also some folktales indicating the special creation of diamond by the hand of the God, in much similarity to the creation of Adam, as Kunz (1938, p.325-326) show: “When the God of the Mines called his courtiers to bring him all known gems, he found them to be of all colors and tints, and of varying hardness, such as the ruby, emerald, sapphire, etc., etc. He took one of each; he crushed them; he compounded them, and said: “Let this be something that will combine the beauty of all; yet it must be pure, and it must be invincible.” He spoke: and lo! the diamond was born, pure as the dew drop and invincible in hardness; but when its ray is resolved in the spectrum, it displays all the colors of the gems from which it was made. “Mine,” said the god, “must be the gem of the universe; for my queen I will create one that shall be the greatest gem of the sea,” and for her he created the pearl”. Fobes. (1906. p. 37-38), refer to ancient myth says: “in ancient times there was a man named Diamond of Crete who refused to obey the command of the oracle of Jupiter, whereupon the god transformed him to stone”. Then he adds: “The Hindus dedicated the diamond to Venus. Since she is the Goddess of Love, it is probable that the origin of a solitaire as the engagement ring grew from this”.

In link with these romances, Jones, (1880, p. 39) tell a wonderful story quoted from Sir John Mandeville, a well-known traveler, indicating diamonds connection with God: “Sir John Mandeville has some singular notions on diamonds, partly, however, derived from Pliny. He says: “They grow together, male and female, and are nourished by the dew of heaven; and they engender commonly, and bring forth small children that multiply and grow all the year. I have oftentimes tried the experiment, that if a man keep them with a little of the rock, and wet them with May-dew often, they shall grow every year, and the small will grow great, for right as the fine pearl congeals and grows great by the dew of heaven, right so doth the true diamond; and right as the pearl of its own nature takes roundness, so the diamond, by virtue of God”.

Beet, and Terpend, (1917, p. 45), embrace the view that a syndicate of scientists and financiers was organized in order to locate a diamond meteor said it was fallen ages ago to punish a tribe of the Indigenous American. The site of fall of the diamond meteorite is the well-known meteor crater at Arizona. The legend says: that some traveller or ranchman lost his way, and, stopping at Meteor Mountain, discovered the spot where this blazing diamond fell. He picked up a meteoric fragment of the many that were strewn around, and found it simply studded with real black diamonds. Sufficient fragments were found to indicate that the meteor itself was pure carbon".

In addition to these wonderful stories, there is beautiful folktale regarding the Vaal diamond of South Africa, which introduces the heavenly source of diamonds in attractive visualization, as it says: after the passing of many moons, and when there was great sorrow in the land, a spirit, pitying the wants and miseries of men, descended from heaven with a huge basket filled with diamonds. The spirit flew over the Vaal, starting beyond Delpoort's Hope, sowing diamonds as be flew on, past Barkly West, Klipdam, and on towards Kimberley, throwing out handful after handful from the huge basket all the while. On reaching Kimberley, where at the time large trees were growing, bis toe got caught in the branches of a high kameeldoorn tree, and, tripping, be upset the basket, emptying out all the diamonds; thus forming the Kimberley mines!" (Beet and Terpend, op.cit, p. 47).

DIAMOND IN METEORITES:

The first scientific attention to the meteoritic diamonds was in 1888, when two Russian mineralogists, Jerofejeff and Satschinoff found that the Novo-Urei, Russia, meteorite contains about I % of ambiguous substance in the form of small grayish grains, of general characters corresponding diamond, which means that the meteorite contains nearly 17.62 grams (85.43 carats) (Bauer, op. cit). This was followed by reporting diamond grains within the fragments of the Canyon Diablo iron meteorite, which created the Arizona meteorite impact crater of a diameter 1200 m. The extracted grains of the meteoritic fragments closely resemble the normal diamond. Since, that time knowledge regarding diamond in meteorites has been expanded and opened a discussion on the possibility that some of the diamonds grains found in placer deposits were originally of celestial source. Streeter (1898, p. 74) provide full explanation of the essence of the idea, as he says: "on dissolving the Arizona meteorites, by means of acids, the diamond may be liberated from their imprisonment in the iron, since they

resist all solvent action. If, now, as pointed out by Sir W. Crookes, these masses of iron, as they lay exposed upon the ground had been gradually attacked by atmospheric agencies, and eaten away as so much rust, all the metal would have disappeared, while the diamonds set free would have been found scattered over the soil, and might then have been naturally regarded as terrestrial minerals. Hence the startling suggestion is forced upon us that some of the diamonds found in sands, gravels, and other superficial deposits on the surface of the Earth, especially where only a single diamond is now and then picked up may, after all, have been originally dropped from the sky in the shape of meteoric matter, and be therefore literally a direct gift from Heaven".

With the debate regarding the source of diamond after the discovery of kimberlite in South Africa, the legends of the heavenly source of diamond became scientific hypothesis, based partly on natural observations represented by the discovery of diamond as well as other forms of carbon in several other meteorites. The meteoritic source of diamond was not only explained its occurrence in the sands and gravels and their consolidated rocks (sandstones, conglomerates, breccia, etc) but extended to include diamond in the volcanic rocks which has known to be ascended from greet depths. The hypothesis of the meteoritic source of diamond says: diamond is a gift from Heaven, conveyed to earth in meteoric showers. According to Crook, (1909, p. 135-136), "the suggestion of the meteoritic origin of diamond was first proposed by A. Meydenbauer, who says: "The diamond can only be of cosmic origin, having fallen as a meteorite at later periods of the earth's formation. The available localities of the diamond contain the residues of not very compact meteoric masses which may, perhaps, have fallen in prehistoric ages, and which have penetrated more or less deeply, according to the more or less resistant character of the surface where they fell. Their remains are crumbling away on exposure to the air and sun, and the rain has long ago washed away all prominent masses. The enclosed diamonds have remained scattered in the river beds, while the fine light matrix has been swept away". Many authors have negatively commented on this hypothesis, while others indicate that it may possible. Crook, (op, cit, p. 136), comment on this hypothesis: "according to this hypothesis, the so-called volcanic pipes are simply holes bored in the solid earth by the impact of monstrous meteors— the larger masses boring the holes, while the smaller masses, disintegrating in their fall, distributed diamonds broadcast. Bizarre as such a theory appears, I am bound to say there are many circumstances which show that the notion of the Heavens raining diamonds is not impossible". In this occasion it is worthy to refer to the huge diamond resource called carbonado, which discovered in Brazil in 1841 and later was

reported in Central African Republic. Its mode of occurrence in sands and gravels (alluvial deposit) without linking with definite sorts of volcanic rocks, like that of the kimberlitic diamonds, released researcher speculations. One of the five supposed hypotheses for its formation is that which suggests that it formed from carbon-rich, diamond-bearing stellar bodies that were transported to Earth by meteorite about four billion years ago. Haggerty (1996, 2014, 2017)

On the other hand, there are prominent scholars deny the contribution of meteorites to the source of the known diamonds, e.g. Wilson, (1992, p. 6), in his admirable book, entitled: "Diamonds: from birth to eternity", indicates that" It is important to an understanding of the prehistory of diamonds to state at this stage that all diamonds, without relevant exception, originated in the depths of the Earth's mantle and were conveyed to the continental surfaces by a kind of volcanic magma known as kimberlite.. It is, however, true that here and there an isolated diamond has been found within a meteorite… It is also true that vast quantities of diamonds have been found without visible trace of their association with kimberlite or kimberlitic minerals: but that is because kimberlite, when exposed to the natural elements, such as wind, rain, frost, ice, flood and (occasionally) even glacier, disintegrates very rapidly". In the meantime, Kwok, (2006, p. 124-125), in his wonderful article under the title: "Gems from the Stars" regret that he will tell the readers that gems they celebrated are not heavenly as the reported extraterrestrial diamonds are surly smaller to incorporate in the lovely rings, as he says: "Modern science has shown that precious stones are nothing more than minerals made up of the same elements found in common rocks, such as carbon, oxygen, silicon, aluminum, magnesium, and iron. Their luster and colors are well understood from the physical principles of refraction, reflection, and dispersion. Their internal structures can be accurately determined through the technique of X-ray crystallography. We now know that, with a few exceptions such as amber and opal, precious stones are atoms arranged in periodic crystalline structures. These various geometric patterns give them their unique optical properties". Then, he asks the question: "According to some myths and legends, gems come from the sky. Could there be any truth to this idea? Sadly, the diamond in your ring did not originate around some other star. Geologists know very well how precious stones are formed in Earth's crust, and in any case interstellar particles are generally much too small. They typically range in size from about a micron (a thousandth of a millimeter) down to clumps of just a few hundred atoms a thousand times smaller still. However, scientists are now

pondering the possibility that some microscopic gemstones now on Earth may indeed have come from space and may be older than our planet".

Meteorites, in fact, may have a major contribution to the terrestrial diamond in three different processes, (i) disintegration the meteoritic materials and liberation their loads of diamond to add to the constituents of the earth's crust, (ii) creation of diamond from the carbonaceous material, which occurs in both meteorites and the target rocks during the large meteorite impacts and (iii) the fall of diamondiferous meteorites.

DIAMOND METEORITES:

It is true from the scientific researches point of view that tiny grains of diamond occur in several sorts of meteorites and in interstellar dust, but it is difficult to say that there are diamond meteorites. When one touches the topic of the existence of diamond meteorites, he remembers, the nice discussion of L. Nikolaev, in his book entitled "Space Chemistry" (Translated from the Russian by Y. Nadler) about the possible occurrence of diamond meteorites. He asks and replies these questions: "Do diamond meteorites exist in nature? Can the appearance in the sky of a multi-ton sparkling crystal or diamond shower be expected? Among the works of Jules Verne, the brilliant French novelist is the witty fantastic novel "The Golden Meteor". It is about an inventor who devised the means of regulating the motion of meteorites and directed to the Earth an enormous meteorite that consisted solely of gold. When he understood, at the last moment, that this mass of gold would inevitably become the cause of conflicts and war between nations and would only bring suffering to the people, the inventor dropped the burning hot meteorite into the ocean. There are no golden meteorites and none are expected; neither are there any diamond mountains in outer space, but diamonds are found in meteorites and, what is of special importance, they are formed in them by collisions. The occurrence of diamonds in meteorites is quite rare and only a few diamond-containing meteorites are known", (Nikolaev, 1976, p. 48-49).

But science with its various instruments, its microscopes and telescopes, its laboratories and research facilities, is organization working to examine ideas. Myths, legends and folktales are the container of ideas. When science expresses the results of its experiments, with hateful pride and overconfidence, it undermines itself and transforms into the image of a new celebrant: a rector who claims to know everything and can test everything. Writers, who refuse submission to the rule of science, go outside and giving their ideas about the diamond

meteorites in amazing stories. The novel entitled ”the king of diamonds says what science doesn’t say. The novel expresses the troubles of a young citizen, who witnessed with his own eyes the fall of a meteorite. He collected its fragments and examined with the aid of one of the famous experts to find it assembled of diamonds. One of the main troubles he faced, that people do not believe that the diamonds in his possession are from heaven, as the novel reviews in one of her dialogues: “It is a common delusion among diamond miners that diamonds fall from the skies in meteoric showers, he said. “There is some sort of foundation for this mistaken view, as the stones are found in volcanic pipes or columns of diamantiferous material, and the crude idea is that gigantic meteors fell and plowed these deep holes, distributing diamonds in all directions as they passed. But the so-called pipes are really the vents of extinct volcanoes. Ignorant people do not realize that the chemical composition of the earth does not differ greatly from that of the bodies which surround it in space; so that the same process of manufacture under high temperature and at great pressure which creates a diamond in a meteor has equal powers here. In a word, what has happened in the outer universe has also happened at Kimberley (The King of Diamonds: A Tale of Mystery and Adventure by Louis Tracy [1863–1928], 1909, p. 69-70).

HYPPATIA STONE THE FIRST AUTHENTIC DIAMOND METEORITE:

In 1996, the present author found the first authentic diamondiferous material in Egypt (Barakat, 1999) inside the strewn field of the Libyan glass area, southwestern Egypt (Fig. 1). Because, the discoverer had no experience with the rough diamond before, he did not realize its nature in the field, but he considered it as ambiguous material, similar to tektites in its surficial appearance. Locating tektites at that time represent a respectable discovery strengths the unrecognized hypothesis (by the discoverer) at that time that the Libyan glass originated from meteorite impact process on the sandstone of the area itself, not as some researchers assumed that the impact happened in distant region and the glass transported by natural processes to its present day location. Then, he collected and carefully preserved for further investigations. The results of investigations (Barakat, 2000, 2005, 2012, 2018) indicate that the material, which is in the size of pebble (Fig. 2), assembled of macroscopic diamond grains and crystals admixed with minor percent of graphite and goethite with quartz calcite and halite from ground contaminations. Diamond occurs as visible bright grains and crystals showing the characteristic luster and cleavage. In hand specimen, the material contaminated with sand and dust of the area with will observed carbonate admixed with clayey minerals in

cavities and along the fissures and cracks invaded the material. The exposed portions of the diamond grains shows well observed bright spots. Pieces of the material subjected to detailed studies using petrographic microscopes, X-ray diffraction analyses, scanning electron microscopic examinations and Raman spectrometric analysis (Fig. 3). All these examinations confirmed that the material assembled of diamond grains. Raman spectrometric analysis of the bright aggregates confirms the presence of diamond in this material. The early interpretation suggested that the diamond occurs in macroscopic aggregates assembled of microcrystalline grains. This interpretation represents, in fact, one side of the reality, because the material contains visible (cm-sized) diamond grains, and what has been described as aggregates of microcrystalline are nothing more or less than the diamond dust resulted from fragmentations the large grains. This dust admixed with other mineral phases filled the cracks (Fig. 4), which running in the material as a whole as well as the large grains, which still maintain their independent general shape, although they were undergone intense mechanical shearing and fragmentation.

Fig. 1: Photograph of the Hypatia stone main mass.

Fig. 2: Photograph showing the main piece of Hypatia stone.

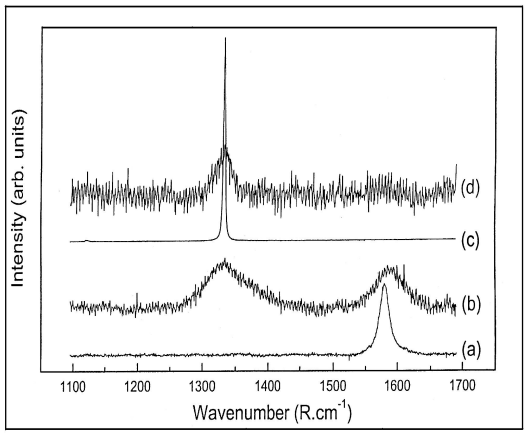

Fig. 3: Raman spectra of the diamond in Hypatia stone.

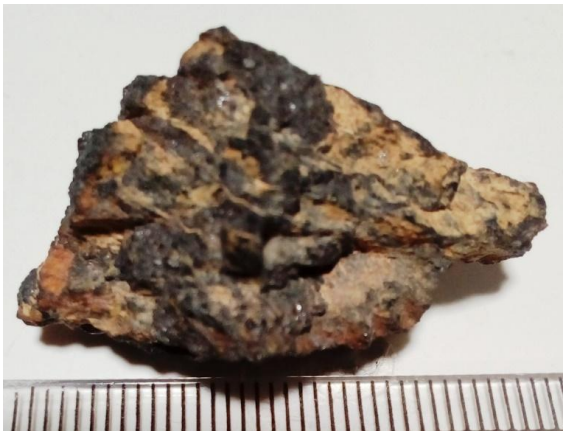

Fig. 4: Photograph of Hypatia stone showing extensive cracks struck the whole mass.

Imaging the material in hand specimen (Fig. 5) as well as under the backscattered scanning electron microscope (Fig. 6,7,8) highlights definite exciting notices. The material as viewed in the image (Fig. 5) is assembled of macroscopic diamond grains of nearly 5-mm sizes. The diamond grains of well-developed octahedral shape. The outlines of these grains are marked with fissures and cracks filled with clayey sands admixed with carbonates from terrestrial contaminations as well as diamond dust. There are two different mode of occurrences of these grains; i) close associated macroscopic grains separated along faint cracks or fissure, (Fig. 5) and ii) large grains separated with matrices of crushed and shattered fine-grained diamond admixed with other mineral phases (as in Fig. 6), which expresses the wide cracks shown in hand specimen (Fig. 4). From these observations one can suggest that the close associated macroscopic grains may represent much larger diamond grains of nearly several centimeter sizes, shattered and broken from collisions in the space or as a result of its mother body collision with the ground. The interesting notation here is the appearance of the foreign contaminations as injected veinlets inside the diamond grains (Fig. 7-8). The analyses carried out indicate different mineral phases admixed with diamond dust (Fig. 7, spot 3 and Fig. 8. Spot 4).Accordingly, one gains that the diamond of this material is of celestial source. If the diamond created as a result of the impact itself, the grains must be small in size as it has established from the diamonds of meteorite impact processes (Masaitis, 1992, 1998). The grains, which created from the impact itself might be smaller and show no extensive field of fractures because they created after departure the shock waves effects of the impact processes. While these grains, which were originally present before the impact receive the shock waves, which have left their tracks in the form of extensive cracks, shattering and shearing in them, like the meant grains in the images. In line with these observations, it is worthy to notice that the analyses of the macroscopic diamond grains, with avoiding the injected impurities along cracks and fissures, as in figure (7, spot 1) indicate that they are completely pure carbon without any other elements.

Fig. 5: Macroscopic diamond grains separated from each other's along wide fissures and cracks, rising the suggestion that it may one large grain divided by fissures and cracks.

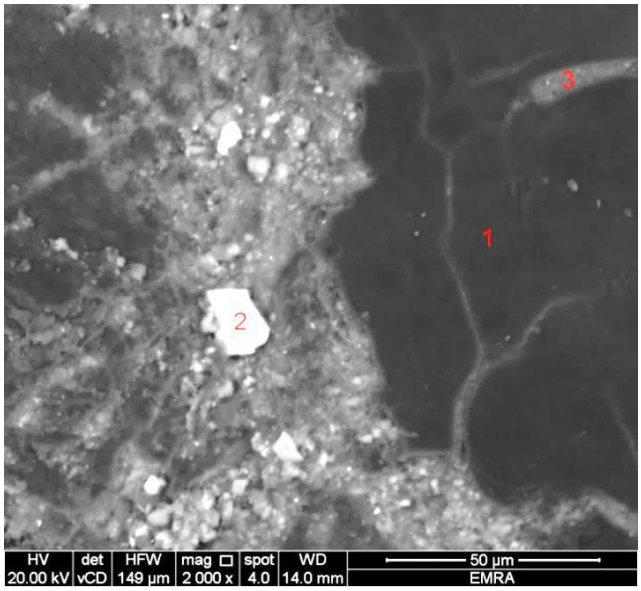

Fig. 6: Backscattered scanning electron microscopic image showing part of a diamond crystal within the Hypatia stone (this crystal is nearly of cm-seized) invaded with extensive field of fissures, along which impurities introduced inside it.

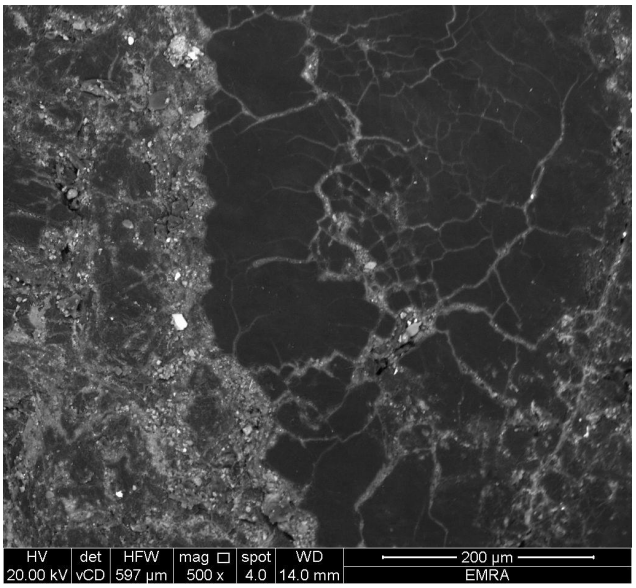

Fig. 7: SEM image of part of a diamond crystal invaded with cracks filled by diamond dust with other minerals (spot 3). The left side of the image shows wide cracks filled with diamond dust admixed with different mineral phases (the bright grain is goethite).

The astonishing and unexpected feature, was obtaining a crystal of nearly 2 cm of octahedral shape, with lower side undeveloped naturally (Fig. 9) and well developed cleavages. The crystal was embedded interior the stone and separated when the original sample was struck by hammer to get fresh pieces. All the tests carried out on it prove that it is without doubt real diamond. In 1998, the author handled the crystal to the director of the Cairo Geological Museum for more investigations. Later on, he informed the author that it had lost! The meant

crystal confirms the characters introduced by Pliny (Adam, 1950, p. 138) to siderites, the type of diamond, which he doesn't refer to its localities, like other types of diamonds. The meant crystal is of octahedron shape, silver color, bright steel luster and shows well developed cleavages, exactly as Pliny states: "Next I must place the adamas called siderites, which shines bright as steel, whence its name". This type of material is the only one which its properties correspond to its name, as it was previously mentioned. In this regard, one may ask this innocent question: did the Museum manger, when he received the diamond crystal remember the act of Gilgamesh when he hid the precious stone away from people's eyes?

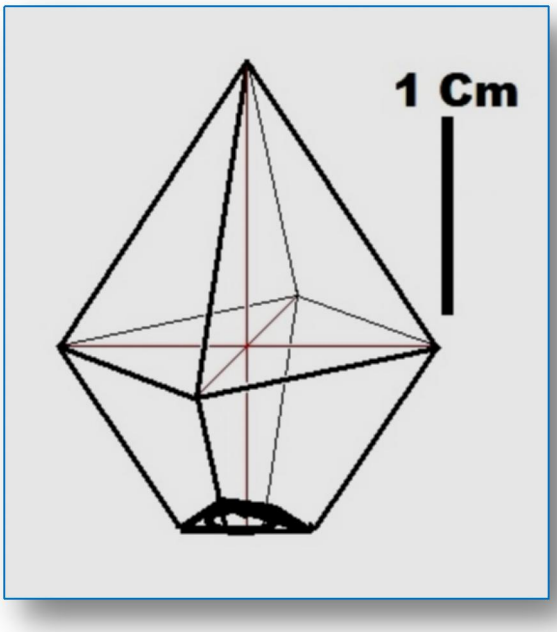

Fig. 8: SEM image of part of a diamond grain invaded by wide cracks filled by foreign minerals. The cracks divide the grain.

Fig. 9: Imagination drawing of the bright silver color lost crystal. The lower end of the crystal is originally incomplete.

After reporting the diamond meteorite landed the western desert of Egypt nearly during the Oligocene period (¬28 m.y. ago) the heavenly source of diamonds strongly expresses itself again. The detection of diamond from the Libyan glass area is one of the most important features. There is no single evidence of igneous activity in the study area or its environs that could account for the confirmed presence of diamond. Accordingly, the discoverer (Barakat, 1999, 2005, 2012, 2018) suggests three possible sources; i) formation from carbonaceous material within the country rocks by heat and pressures generated from the impact process, as streaks of coal are known to occur in the Nubian sandstones, ii), formation from carbonaceous material within the impactor as a result of high temperatures and pressures generated from its collision with the ground, as it is well demonstrated that carbonaceous chondrites in particular contain measurable content of carbon, and iii), the diamond is of extraterrestrial source.

The material has recently received considerable interest. Several studies demonstrate that the diamond within Hypatia stone is of extraterrestrial derivation, confirming the third hypothesis of the discoverer. Moreover, more studies carried out on Hypatia stone indicate that it represents material of pre solar foundation (e.g., Belyanin, et al., op. cit). The reported fragment is not in fact the whole mass which landed the site, but it represent survival mass of a huge body, judging from reporting tiny diamond grains in the impact breccia of the area itself (Barakat, 2003), tens km far away from location site of Hypatia stone. In addition, definite mineral phases within the Hypatia stone have been incorporated within the soil of the area, indicating that Hypatia was huge celestial mass. The discovery of Hypatia comes in line with the suggestion that Carbonado represents giant diamond meteorite, as has previously mentioned.

SUMMARY:

Naming diamond as “Adamas” is not a Greco-Roman writer’s designation but it is attributed to Mesopotamian civilization, and the word itself is the ancient Akkadian word “adamu” and its various synonyms, as one of the earliest Assyrian rulers carries the name “Adamu”, a word bears different meanings, include red color, dark red, ornaments, noble persons, etc. In the meantime, the name adamas may represent modification of the Akkadian word “elmasu” and its synonym “elmeshu” that they are used in the present day in Arabic language to designate diamonds. Both words are mentioned in Gilgamesh's epic to refer to a valuable stone the hero hided from people in a safe place.

Ancient legends connect diamond with heaven in different ways, as they claim that it created by God and brought by Adam, when he left the paradise to inhabit the earth or it created from heavenly processes, such as thunder, thunderbolts or it represents the solidified tears of Adam or the Lord. The heavenly source of diamond manifested also in legends that assume that Jupiter is a planet made of diamond.

The heavenly occurrence of diamonds has been proven along different sorts of scientific researches call attention to the occurrence of tiny grains of diamonds in some iron and stone meteorites as a result of shock in terrestrial or asteroidal impact processes. More advanced step in this regards come from studies demonstrating that Nano-diamonds of interstellar source occur within definite meteorites (e.g., Lewis, et. al, 1987), as well as the detection of diamonds in one of the stars in the Chamaeleon Cloud, one of the most active star formation sites near the solar system, Kwok, (2013). These researches estimated that there are about 100,000 to 1,000,000 trillion (1017–1018) tons of diamonds in the surroundings of the star HD 97048 (Guillois, et. al, 1999). However, the researchers do not indicate the size of the diamonds in clear statements.

The discovered sample of Hypatia is nearly 30 grams, but studies suggest that it may represent small chunk of a large diamond meteorite struck the sandstone country rock during the Oligocene period (~28 million years ago) and formed the unique material of gem quality called Libyan glass (Barakat, 2018). Sporadic diamond grains have been reported in the region without linking with definite source except Hypatia stone mother body, which according to the suggested scenario it was large enough to create the huge quantity of the Libyan glass and excavated crater of nearly 45-km diameter (Barakat, 2012). Contrary to what is established about its nano size in meteorites, interstellar and in the large meteorite impact crater sites, diamond in Hypatia stone is macroscopic crystals and grains embedded in a mixture of micro grains of diamond, graphite and other rare mineral phases. The micro grains may be originally smaller in size, or resulted from disintegration the large grains as a result of collisions processes in space or as a result of impact of the holding body with the ground. The recovered (and lost) diamond crystal from Hypatia stone confirms the accuracy of Pliny statement concerning the type of diamond called siderites. The crystal which is of heavenly source resembles the sight of the distant stars in its bright silver color and its octahedral shape. In the meantime, it is of ideal use in engraving and suitable to insert in an iron rod to be the tool (pin) mentioned in the Prophet Jeremiah’s statement.

The previously published data don't reflect the factual nature of the Hypatia stone, which is real diamond meteorite not as it has described as a diamond-rich material. In fact, a great pressure was practiced on the discoverer, for two main optional reasons, i) there was no known diamonds in Egypt before this discovery, and, ii) the Libyan glass area was extremely investigated over tens of years without any indications of meteorite impact features. So, many of the meant agencies realized that this discovery represents a strong challenge for whom involved in the geology of Egypt as well as for those whom specialized in studying meteorites and meteorite impact processes. Accordingly, the published results were conservative and cautious to the greatest extent in order to avoid rejection or at least criticism. Even, the studies which established the extraterrestrial source of the material did not refer to the visible diamond crystals and grains, which are easily noticeable as bright spots in the material. One does not know a valid reason for ignoring this fact, except the fear of crossing the boundaries between science and legend. Just as the legend in the past, used to have guardians, in our present time there are protectors and curators, who ruled against the infiltration of any notions from outside the context. Finally, in one word (quoting the expression from the King of Diamonds novel) this simple discovery moves the topic of diamond meteorites from the circle of legends to the realm of sciences.

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