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PORTRAIT OF THE QUEEN OF SIKKIM.

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PLATE I

The reigning queen (Mahārānt) of Sikkim, after an oil-portrait by Damodar Dutt, a Bengali artist, in the collection of the Field Museum (Cat. No. 117815, acquired by the writer at Darjeeling in 1908). The queen is a full-blooded Tibetan princess born at Lhasa in 1864 and was married to the present king of Sikkim as his second wife in 1882. Both were taken prisoners by the British in 1893 and held in captivity at Darjeeling. During that time she used to sit to the Bengali painter for the portrait in question which was completed in 1908. The writer had an audience with her in her palace at Gangtak, the capital of Sikkim, at which time she was dressed in the same state-attire and with the same jewelry as in this painting. Her crown, the peculiar headdress adopted by the queens of Sikkim, is composed of broad bandeaux made up of pearls, interspersed with turquoises and corals alternating. Her gold earrings are inlaid with a mosaic of turquoises in concentric rings. The necklace consists of coral beads and large yellow amber balls, and has a charmbox (*gau*) attached to it, set with rubies, lapis lazuli and turquois. She wears a bracelet of corals and two gold rings set with turquois and coral.

Mr. J. Claude White, the British Political Officer of Sikkim (in his book "Sikkim and Bhutan," p. 22, London, 1909) characterizes her as a striking personality, extremely bright, intelligent, and well educated; her disposition, he says, is a masterful one, and her bearing always dignified; she is always interesting, either to look at or to listen to, and had she been born within the sphere of European politics she would most certainly have made her mark, for there is no doubt she is a born intriguer and diplomat.

Another oil-portrait in the Field Museum from the hands of the same artist represents the Mongol Lama Shes-rab rgya-mts'o ("The Ocean of Wisdom") born in 1821 at Kūkā-khota ("Blue City," in Shansi Province, China), teacher to the Pan-ch'en Lama, then interpreter in the Anglo-Indian Civil Service; he was distinguished for his Tibetan scholarship, particularly in the department of astronomy and astrology; he did useful work in assisting English translations of Tibetan books, and died at Darjeeling in 1902, at the age of eighty-one. Damodar Dutt received for this portrait a medal from the Bombay Art Exhibition.

Dimensions of above portrait: 1.74 x 1.06 m.

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ANTHROPOLOGICAL SERIES
VOLUME XIII



CHICAGO
1913-14

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NOTES ON TURQUOIS IN THE EAST

BY

BERTHOLD LAUFER.

Associate Curator of Asiatic Ethnology



CHICAGO, U. S. A.

July, 1913.

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PREFACE

In April, 1911, Dr. Joseph E. Pogue, mineralogist in the U. S. National Museum of Washington, requested my co-operation in bringing out an extensive monograph which he contemplated on the turquoise from the mineralogical, historical, and ethnological points of view. It was originally intended that the following notes should be embodied in the form of an appendix in Dr. Pogue's proposed work which I understand is now complete in manuscript. As adverse circumstances beyond the control of the author have unfortunately delayed for the last two years the publication of his study, and as a recent official journey to Alaska will prevent for some time longer active operations on his part, my contribution to his work is herewith issued in a separate form. It should be understood that only the exhaustive monograph of Dr. Pogue, which it is sincerely hoped will come out in the near future, will lend these notes their proper background and perspective. As at one time a plea was made by me for the co-operation of naturalists and orientalists (*Science*, 1907, p. 894), it is gratifying to note that we have advanced a step farther in this direction, and it will be seen on the following pages that oriental research can also bring to light new and not unimportant facts as yet unknown to our natural science. The occurrence of the turquoise in Tibet and China, and to a higher degree, its history and cultural position in those countries, present a chapter of knowledge with which our mineralogists have been hitherto unacquainted. But only concerted action and sympathetic co-operation can lead us to positive and enduring results. The orientalist needs the naturalist as much as the latter, when his inclinations carry him to Asia, may profit from the stimulus of the former, in that he can suggest and encourage problems, the solution of which will turn out to be of vital significance to archaeology. Our mineralogical knowledge of Eastern and Central Asia is in a very unsatisfactory condition, and it is desirable that the horizon of our mineralogists should no longer be bordered by the Panama and Suez canals. There is a great and promising field open between the two, and a plan which a mineralogist should follow in aiding the cause of archaeology in Asia is briefly indicated on p. 54.

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For various information I am under obligation to Dr. Friedrich

PREFACE

Hirth, professor of Chinese at Columbia University, of New York; to my friend Paul Pelliot, professor at the Collège de France in Paris; to Prof. Georg Jacob at the University of Kiel; and to Dr. Julius Ruska at the University of Heidelberg. The contributions courteously made by these gentlemen are clearly acknowledged as such in each particular instance.

BERTHOLD LAUFER.

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NOTES ON TURQUOIS IN THE EAST

BY BERTHOLD LAUFER

I. TURQUOIS IN INDIA

The peoples of ancient India do not seem to have been acquainted with the turquois,¹ nor do they possess an indigenous word for it. The Sanskrit term *peroja* (also *perojā*, *pīroja*) or *perojana* is a comparatively recent loan word of mediæval times derived from New-Persian *ferozah* (older form *fīrūzag*), from which also the Russian word *biruza* and Armenian *pīroza* come;² and the Sanskrit designation *haritācma* is a compound with the meaning "greenish stone." The older Sanskrit treatises on precious stones do not make mention of it. Neither Buddhahatṭa, a Buddhist monk who wrote the *Ratnaparīkshā*, that is, the "Appreciation of Gems,"³ presumably before the sixth century

¹ Our name *turquois* (from French *turquoise*, Old French also *tourques*) means Turkish stone (there is also the word Turkey-stone, formerly turky-stone), not because the stone is found in Turkey, but because the most reputed kind, coming from Persia, first reached Europe by way of Turkey; the Venetians seem to be the first to have imported it (Italian *turchese*), and also to have made of it imitations in glass. The Latinized names were *torcois*, *turcosa*, *turchina*, or *turchesia*, and A. BOËTIUS DE BOOT, court physician to Emperor Rudolf II (*Gemmarum et lapidum historia*, ed. A. TOLL, p. 265, Lugduni Batavorum, 1636; the first edition of this interesting work appeared at Hanover in 1609) states: "Omnibus nationibus eo nomine notissima, quod a Turcis ad nos feratur." Others hold that the allusion to Turkey in the stone implies no distinct geographical notion but vaguely means "coming from the Orient" (O. SCHRADER, *Realexikon der indogermanischen Altertumskunde*, p. 153, Strassburg, 1901); indeed, Turkey was for a long time a term of uncertain value, almost having the meaning of "strange," and was even connected in Europe with two American products,—our North American bird, and maize (sometimes known as Turkish wheat). At any rate, the Turks were acquainted with the turquois, in particular with that of Persia, calling it by the Persian name *fīruze*. According to a kind communication of Prof. GEORG JACOB, the turquois is described in a Turkish work on mineralogy written in 1511–12 A. D. by Jahjā Ibn Muhammad al-Gaffārī (manuscript in Leipzig, Catalogue of FLEISCHER, p. 508, No. 265). Five principal kinds are distinguished: Nishapuri, Gaznewi, Ilaqi, Kermani, and Khārezmi; the first, the well-known turquois from Nishāpūr in Persia, is regarded as the most valuable, being hard, and fine, and permanent in color; the various sorts are described and followed by reports of celebrated turquoises in the history of Islam.—Shakespeare (*The Merchant of Venice*, Act III, Scene I, in the folio edition) has the spelling *Turkies*; the poet Tennyson adheres to the old form *turkis* (Middle English *turkeis*, on a par with German *türkis*, Middle High German *turkoys*, *türkīs*; in the seventeenth century, *turkes*). The usual English spelling, in accordance with French, is *turquoise* (formerly it was written also *turcois* and *turkois*); in scientific writings in this country the spelling *turquois* is now generally adopted.

² The Persian turquois is not discussed here, as it will be treated by Dr. Pogue in his monograph. The course of our investigation, however, necessitates touching also upon this subject, and some brief notes bearing on it will be found on p. 38.

³ Edited and translated by LOUIS FINOT, *Les lapidaires indiens* (Paris, 1896).

A. D., nor *Varāhamihira* (505–587 A. D.) in his work *Bṛihatsaṃhitā* allude to the turquois. Agasti, in his versified treatise on gems, the *Agastimata*, and a very late work, the *Ratnasamgraha*, each devote a stanza to the turquois.¹ The date of the former work is not satisfactorily established. Inward evidence leads one to think that it is posterior to the sixth century A. D., and that a work under this name possibly existed in the thirteenth century, while in its present shape it is, in all likelihood, of much later date. Of greater importance is the little mineralogical treatise *Rājanighaṅṭu* written by Narahari, a physician from Kashmir, not earlier than the beginning of the fifteenth century. According to Narahari, the two words as given above are used to distinguish two varieties of the stone, as the hue is either ash-colored or greenish. He remarks that it is astringent and sweet to the taste, and an excellent means to provoke appetite; every poison, whether vegetable or mineral, or a mixture of both, is rapidly neutralized by turquois; it also relieves the pain caused by demoniacal and other obnoxious influences.² As, in all likelihood, the acquaintance

¹ L. FINOT, *l. c.*, pp. 138, 197.

² Compare R. GARBE, *Die indischen Mineralien*, p. 91 (Leipzig, 1882). In the introduction the date of Narahari's work is calculated at between 1235–1250; Prof. Garbe has been good enough to inform me that he has now arrived at the conclusion that the work cannot be earlier than the fifteenth century. The turquois, accordingly, appears on Indian soil very late during the middle ages, in the Mohammedan period. The evidence gathered from mineralogical literature is corroborated by the records of Indian medicine. The famous Bower Manuscript assigned to the year 450 A. D., the brilliant edition and translation of which has just been completed by Dr. A. F. R. HOERNLE (Calcutta, 1893–1912), does not make any mention of turquois, nor do the ancient physicians of India. (For this reason, J. JOLLY, *Indische Medicin*, does not note the stone.)—It is asserted on the authority of the *Periplus Maris Erythraei* (Ch. 39), a Greek work of an unknown author from the latter part of the first century (probably written between 80–89 A. D., roughly about 85; see the recent discussion of the date by J. F. FLEET, *Journal Royal Asiatic Society*, 1912, pp. 784–7) that turquois was exported from the Indian port Barbaricon. Mr. W. H. SCHOFF, in his new translation of the work (*The Periplus of the Erythraean Sea*, pp. 38, 170, London, 1912), feels very positive on this point, and explains that “the text has *callean* stone, which seems the same as Pliny's *callaina* (xxxvii, 33), a stone that came from ‘the countries lying back of India,’ or more definitely, Khorassan; his description of the stone itself identifies it with our turquois, etc.” This opinion, however, is more than hypothetical. First of all, as already pointed out by LASSEN (*Indische Altertumskunde*, Vol. III, p. 14, Leipzig, 1858), it is doubtful whether the *calleanos* of the *Periplus* is identical with the *callaina* of Pliny, because the localities where, according to the latter, the stone is found are too remote from India to make it possible for it to have been exported from the port of Barbaricon at the mouth of the Indus. Secondly, the supposed identification of Pliny's *callaina* or *callais* with the turquois is no more than a weak guess, and one that is highly improbable; and a mere guess, even though it may be repeated by a dozen or more authors, will never become a fact. It is said in DAREMBERG and SAGLIO (*Dictionnaire des antiquités grecs et romains*, Vol. II, p. 1463): “On suppose que c'est la turquoise;” and H. BLÜMNER (*Technologie und Terminologie der Gewerbe und Künste bei Griechen und Römern*, Vol. III, p. 249, Leipzig, 1884) justly concludes that the evidence does not by any means seem to be sufficient to establish the identification of the turquois with the *callais* of the ancients as a positive fact. The vague “description” given by Pliny (XXXVII, 110–2, 151) of the stone bears out no striking reference to the

of the Indians with turquois was conveyed to them by way of Persia, it seems highly probable also that their beliefs in the medicinal properties of the stone, were at least partially derived from Mohammédan lore.¹

From an interesting text of the Arabic traveler al-Berūnī (973-1048) translated by E. WIEDEMANN² we now see that Persian turquoises were indeed exported from Persia into India, for the Arabic author remarks in his notes on the *firūz*ag (turquois) that the people of Irāg prefer the

turquois, its main characteristics not being at all set forth, and may suit many other stones as well; the pale green color (*e viridi pallens*) and the attributes *fitulosa ac sordium plena* by no means fit the Persian turquois which owes its reputation to its deep-blue tinge and its purity, nor has turquois the color of the emerald; the localities pointed out by him (nascitur post aversa India, apud incolas Caucasi, montis Hyrcanos, Sacas, Dahas) rather militate against the turquois. Mr. Skoff's hint at Khorāsān (not given by Pliny, who only alludes to Carmania) is a somewhat arbitrary opinion prompted by the desire to suit the convenience of his case. The principal point at issue, however, is that there is no evidence for the alleged mining of turquois on Persian soil in the first century A. D. (see p. 40) merely presumed but not proved by Mr. Skoff and his predecessors. If Pliny had known about the quarrying of turquois in Khorāsān, he would have plainly stated the fact with an undisguised reference to Persia or that particular province; but there is not one classical author with a knowledge of Persian turquois, nor is there any evidence proving that turquois was traded from Persia into Greece and Rome. The tradition of India incontrovertibly shows that the Persian turquois, both in its name and as a matter, appeared in India only as late as the Mohammedan period, and the negative evidence of archæology lends further support to this conclusion. Enough archæological work has been carried out in India to prompt us to the positive statement that, despite the numerous precious stones discovered in ancient graves, no find has ever yielded a single turquois. The jewels, for example, in the burial-place of Buddha at Piprāvā discovered by W. C. PEPPE (*Journal Royal Asiatic Society*, 1898, p. 573; RHYS DAVIDS, *ibid.*, 1901, p. 397; G. OPPERT, *Globus*, Vol. LXXXIII, 1903, p. 225) were carnelian, conch, amethyst, topaz, garnet, coral, and crystal. A similar state of affairs in regard to the Persian turquois, as will be seen on p. 56, obtains in China where the turquois of Nishāpūr and Kermān became known very late in the middle ages, during the Mongol period of the fourteenth century. It is thus plainly indicated by these two coincidences in India and China which cannot be merely accidental that it was only the Arabs, and after the conquest of Persia in 642 A. D., who imported the turquois from Persia into India and China; and the fact is quite certain that only in this late period the Persian turquois began to conquer the market of the world. There is, accordingly, no reason whatever to interpret the stone in question mentioned by the *Periplus* as the Persian, or any other turquois. The best supposition would be to recognize in the word of the Greek text, as in so many others of the *Periplus*, the transcription of an Indian word (compare J. BLOCH in *Mélanges Sylvain Lévi*, p. 3, Paris, 1911), presumably Sanskrit *kalyāna*, "good, fine, excellent," which is one of the attributes of gold (R. GARBE, *Die indischen Mineralien*, p. 33), or in the form *kalyāṇaka* iṣ used with reference to medicines (compare also *kalyāṇī* and *kalyāṇikā*, "red arsenic"). See also p. 41, note 6.

¹ On the other hand it should not be overlooked that certain notions entertained regarding turquois among the Arabs and persisting later in Europe are absent in India and Tibet. Among these are the employment of the stone as an eye-remedy and against the stings of the scorpion, the latter idea first appearing in the Greek physician Dioscorides of the first century (compare L. LECLERC, *Traité des simples* par Ibn el-Beithar [1197-1248], Vol. III, p. 50, *Notices et extraits des manuscrits de la Bibliothèque Nationale*, Vol. XXVI, Paris, 1883, J. RUSKA, *Das Steinbuch des Aristoteles*, p. 152 [Heidelberg, 1912], and BOETIUS DE BOOT, *l. c.*, p. 270).

² Ueber den Wert von Edelsteinen bei den Muslimen (*Der Islam*, Vol. II, 1911, p. 352).

smooth ones, those of India like the round ones with convex surface.¹ This is so far also the earliest testimony for the presence of the turquois in India.

The fact that turquois is absent from India is confirmed by the negative testimony of the great merchant traveler JEAN BAPTISTE TAVERNIER (1605-1689), who, as a dealer and expert in precious stones, repeatedly traveled in India and became thoroughly familiar with the customs of that country. He writes in chapter nineteen of his *Travels*:²

“Turquoise is only found in Persia, and is obtained in two mines. The one which is called ‘the old rock’ is three days’ journey from Meshed towards the north-west and near to a large town called Nichabourg (Nishāpūr); the other, which is called ‘the new’ is five days’ journey from it,” etc.

Tavernier would have certainly known about the existence of turquoises in India if they ever occurred there *in situ*. The various reports of modern travelers that turquoises are imported from India into Tibet are therefore to be interpreted in the sense that these Indian turquoises have been imported from Persia.

Also MAX BAUER³ states that turquois is not found in India, Burma and Ceylon. But the same author does not note its occurrence in Tibet and China.

Abul Fazl Allami⁴ (1551-1602), in his history of Akbar, enumerates among the precious stones in the treasury of the emperor rubies, diamonds, emeralds, and pearls, but not turquois. Turquois seems to have been everywhere an ornament of the people, but not one of royal personages.⁵

In the modern jewelry of India the turquois is utilized to some

¹ The opinion formerly prevailed in Europe that the turquois was found in India because it was exported from there. This was the view of FRANCISCUS RUËUS (*De gemmis aliquot*, p. 54 b, Tiguri, 1565); but the turquoises exported from India were in fact derived from Persia.

² Ed. of V. BALL, Vol. II, p. 103 (London, 1889).

³ *Precious Stones*, p. 397 (London, 1904).—G. WATT (*A Dictionary of the Economic Products of India*, Vol. VI, p. 204, London, 1893) says after the *Manual of Geology of India*: “The existence of the true turquois in India is doubtful. From the presence of blue streaks in the copper ores of Ajmir, Mr. Prinsep suggested the possibility of the stone being found there. Subsequently Dr. Irvine reported its existence in these measures, but, according to Ball, the so-called turquoises of Ajmir are only blue copper ore.”

⁴ *The Ain I Akbari*, translated from the Persian by H. BLOCHMANN, Vol. I, p. 15 (Calcutta, 1873). The original was published in 1597.

⁵ Compare p. 30, note 3. In the Arabic account of Abu Zeid of the ninth century (translated by M. REINAUD, *Relation des voyages faits par les Arabes et les Persans dans l’Inde et à la Chine*, Vol. I, p. 151, Paris, 1845) it is said: “The kings of India are in the habit of wearing ear-pendants consisting of precious stones mounted on gold; they wear necklaces of the highest price composed of red and green stones of the first quality. But it is the pearls on which they place a greater esteem, and which are eagerly coveted by them; these now form the treasure of the sovereigns, their principal wealth.”

extent in connection with pearl, ruby, diamond, sapphire, topaz and emerald, set in silver or gold.¹

II. TURQUOIS IN TIBET

As jade is the recognized jewel of the Chinese, so turquoise is the standard gem of the Tibetans. In the eyes of the Chinese jade is not a stone, but forms a distinct class *sui generis*, as is shown by such constant phrases uttered from the lips of stone dealers: *shi yü pu shi shi-t'ou*, "it is jade, it is not a stone."² To call a turquoise a stone means an offense to the Tibetan, and he will exclaim indignantly, *di yü re, dö ma re*, "this is a turquoise, and not a stone." The Tibetan word for turquoise, *gyu* (pronounced *yu*, without sounding the prefix *g*, which, however, appears in the Mongol loan word *ughiu*)³ is indigenous property, being derived neither from Sanskrit nor Chinese; it shows that turquoise must have been known to the Tibetans since remote times. There are, doubtless, also many ancient turquoises still in their possession as they are inherited from mother to daughter for generations, and thus kept as heirlooms in the same family for centuries; being constantly exposed to the open air, they readily change color and often assume a pale green shade, more or less tainted with black spots.

Two special sorts of turquoises are called *drug-dkar* and *drug-dmar*, that is, white *drug* and red *drug*; the word *drug* designates the number 6, and the two terms are explained to designate very fine kinds of turquoises supposed to be one-sixth part white or red in tint, respectively. DESGODINS, in the Tibetan Dictionary published by the French missionaries, translates the two by white and red sapphire, but also reminds

¹ G. C. M. BIRDWOOD, *The Industrial Arts of India*, Vol. II, p. 25. In the Higinbotham collection of jewelry in the Field Museum there are several fine specimens of Indian jewelry in which turquoise is employed, collected in India by Mr. Lucknow de Forrest of New York. G. WATT (*l. c.*) remarks that the turquoise is largely used by the natives of India in jewelry but that imitations are perhaps more generally employed than the true stone. While I do not deny that such imitations may occur, I do not believe that they are very generally in use.—Aside from the mineralogical treatises quoted above, as far as I know, the word for turquoise has not yet been pointed out in any other work of Sanskrit literature. The Sanskrit romance *Vāsavadattā* by Subandhu of the seventh century (translated by L. H. GRAY, pp. 85, 109, *Col. Un. Indo-Iranian Series*, Vol. VIII, New York, 1913) mentions a necklace of pearls and sapphires, further emeralds and rubies, diamonds and other stones, but not turquoise, which, as shown also by such passages, was a late intruder in such combinations as stated above, and alien to the artistic taste of India.

² The agate (*ma-nao*) is, in the eyes of the Chinese, "neither a stone nor a jade," but a thing for itself.

³ In more ancient texts the word is written also *rgyu*, thus showing that in the ancient pronunciation also the *g* was sounded. A singular word for turquoise is the Mongol *kiris* which has thus far been pointed out but once in literature (LAUFER, *T'oung Pao*, 1908, p. 431), and which presumably represents the ancient Mongol word for the turquoise in times before the introduction of the Tibetan loan word.

us of the fact that the native dictionaries interpret them as *gyu* "turquois." While I have encountered a great number of turquoises with white and black veins and streaks, I have never seen any with a red tinge.¹ This classification of turquoises is contained in the ancient Tibetan medical work known under the abbreviated title "The Four Tantra"² (*rgyud bñi*, Peking edition, Vol. II, fol. 145 b). The literary history of this interesting work remains to be made out.³ Originally based on a standard Sanskrit work translated into Tibetan in the middle of the eighth century, it passed through the hands of several distinguished Tibetan physicians who revised and increased the work considerably. It contains not only information on Indian anatomy, pharmacology and therapeutics, but also valuable material with respect to the natural products of Tibet and Mongolia. The manifold subsequent interpolations render the utilization of these notes for historical research exceedingly difficult when the question arises as to the time to which they must be referred. A literal translation of the notice regarding turquois runs as follows:

"The turquois, in general, represents one species with two varieties, — that of best quality and the common one. Of the former there are two kinds, the one blue and white, of great lustre, called *drug dkar*; the other blue and red, of great lustre and polished, called *drug dmar*. There is, thirdly, a turquois of superior quality excelling the others in splendor, known as the turquois *sbyad*, 'beauty.' The common ones are 'the intermediate turquois resembling the *drug dmar*,' and 'the blue turquois resembling the *drug dkar*.' There are, further, the Indian turquoises originating abroad, and others. They entirely remove poison and heat of the liver. Substances belonging to the class of turquois and rock-crystal are so-called elements not fusible."⁴

If it could be proved with certainty that this note in the present tenor was already contained in the Sanskrit text or in the Tibetan version of the eighth century, it would be of a certain value in showing that at that comparatively early date turquoises were known in India, perhaps also traded from India into Tibet and then played a rôle in the pharmacopœa of both countries. But such evidence could be established only on the ground of an ancient edition preserving the original status

¹ Dr. Joseph E. Pogue informs me that the iron-oxide matrix in turquois from a number of localities is reddish.

² See HEINRICH LAUFER, *Beiträge zur Kenntnis der tibetischen Medicin*, p. 12 (Berlin, 1899).

³ The brief notes given by Mr. WALSH (*Journal Royal Asiatic Society*, 1910, p. 1218) are not yet satisfactory and far from being exhaustive.

⁴ In opposition to the four metals, gold, silver, copper and iron, enumerated shortly before this passage, which are designated as "fusible elements."

of the work. From what has been said above regarding the history of the turquois in India it is not very probable that the passage existed in the Sanskrit original, and if we assume on the basis of the available evidence that the Persian turquois spread in India between the tenth and the fifteenth century, the clause of the Tibetan text relative to Indian turquoises must be regarded as an interpolation, not older perhaps than the sixteenth century. The one feature, however, is conspicuous that the Tibetan terminology of the turquois varieties is not borrowed from India, but created in Tibet; it distinctly refers to the native stones, in opposition to those of India named last, and may well claim a certain age. Altogether six kinds are enumerated, and in the plates illustrating all objects of the *materia medica* described in the text, six kinds of turquois are really pictured.

The plates here referred to are twelve large scrolls or charts preserved in the Great Lama Temple (*Yung ho kung*) of Peking, exact copies of which I had made by an experienced Lama painter; the anatomy and physiology of the human body, and all medicinal substances derived from the three kingdoms are there figured in colors, labeled with their Tibetan names and accompanied by references to the chapters of the Four Tantra where they are described. The turquoises are represented, like the other substances, as being placed in rectangular trays supported by a standard or provided with three feet. The first two kinds, *drug dkar* and *drug dmar*, are painted in a deep-blue color and of oblong shape, no noticeable difference between the two being visible; the edge is marked by a blue line in gold (apparently to express the high quality of the stone) bordered by a line of black ink. It is curious to observe that in each case six stones have been outlined, and it is therefore evident that the draughtsman was guided by a literal interpretation of the two terms *drug dkar* and *drug dmar*, "White Six" and "Red Six." It is hardly plausible that a set of six stones should have been the fixed requirement in ancient times and resulted in this peculiar nomenclature, and I am also inclined to think that the modern Tibetan explanation as given above,— a stone containing one-sixth of white or red tinge,— is a makeshift or an afterthought. It would seem more reasonable to assume that *drug* in this case has no connection with the numeral six, but is an ancient noun signifying this particular variety of turquois. The third variety *sbyad*, also a group of six stones, is painted light-blue; they are pear-shaped, almost globular, surmounted by a curved tip. The two common kinds are each figured as one large stone, the one light-blue, the other grayish-blue, both of curious and fantastic outlines which it is hard to describe. On the second of the two, cloud-patterns in Chinese style of drawing are delineated, probably

intended to indicate a "clouded" stone,¹ while the first is decorated with horizontal rows of small black rings presumably expressing veins in the stone. The Indian turquoises, again six in number, are, in distinction from all the preceding ones, light-green in color with fine black veins, and pointed or triangular in shape. It certainly remains an open question as to how far these drawings are faithfully preserved, but despite their imperfection we may learn from them that the appreciation of turquoises by the ancient Tibetans was graduated as follows: Deep-blue, lustrous stones without flaw took the foremost rank;² white and red strips or layers were not considered a blemish, but rather a special beauty; the lighter the blue, and the more approaching a gray and green, the more it sank in estimation; stones with black veins and streaks and with cloudy strata were looked upon as common, also those of greenish hues. It is interesting to note that this scale of valuation doubtless going back to ancient times holds good also for the present age.

The small turquoises not larger than a lentil and used for the setting in rings, are designated *pra*.

As famous swords, daggers, saddles and coats-of-mail received in Tibet individual names, so also celebrated turquoises were given special designations. Thus, we read in the History of the Kings of Ladakh that among fifteen turquoises brought from Gu-ge in West Tibet, the best were two, namely, the *Lha gyu od-ldan*, "the resplendent turquois of the gods," and the *Lha gyu dkar-po*, "the white turquois of the gods."³ Thus, there are also celebrated historical turquoises, as it is recorded in regard to King Du-srong mang-po (beginning of the eighth century) that he found the largest turquois then known in the world, on the top of Mount Tag-tse, a few miles north of Lhasa.⁴

The name of an ancient well-known family of Tibet is *gYu-t'og* (that is, Turquoise-Roof). The most celebrated member of it was a physician and author of medical works, who flourished in the eighth century and three times visited India to study medicine at the University of Nālanda. His biography, a very interesting work, is still in existence where it is narrated that he was once visited by gods and demons, who presented

¹ A term used also in India (R. GARBE, *Die indischen Mineralien*, p. 72, note 2) and in our mineralogy (with respect to veins or spots of lighter or darker color than the area surrounding them).

² This was the case likewise among the Arabs. The best sort of turquois was considered the one "of a complete purity of color, of a perfect polish, and of a hue entirely uniform" (L. LECLERC, *Traité des simples par Ibn El-Beithar* [1197-1248], Vol. III, p. 51, *Notices et extraits des manuscrits de la Bibliothèque Nationale*, Vol. XXVI, Paris, 1883). In a similar manner, al-Bērūnī expresses his opinion (WIEDEMANN, *Der Islam*, Vol. II, 1911, p. 352).

³ *Journal Asiatic Society of Bengal*, Vol. LX, pt. 1, 1891, p. 123.

⁴ *Journal Asiatic Society of Bengal*, Vol. L, pt. 1, 1881, p. 223.

him with an immense quantity of turquoises and other precious stones, heaping them on the roof of his house, hence the origin of his name. The mansion of this family still stands in Lhasa near a bridge called "Turquoise-Roof Bridge." A Chinese author, writing in 1792, mentions this bridge and records the following tradition: "In the transparent waters of the river are turquoise, colored rocks whose bluish tinge seems on the point of dissolving into water; the tops of the stones are bowl-shaped; if once dug away from the mud around them, they would look as big as elephants. One cannot take pebbles out of this river as an amusement as easily as in other streams."¹ It is not known whether this tradition is founded on fact, or whether the tradition connected with Doctor gYu-t'og and his name gave rise to the notion of turquoises existing in the river whose blue tinge may have lent a support to such a view; for in another Chinese source, according to ROCKHILL, it is said: "At the foot of Marpori (the mountain on which the palace of the Dalai Lamas rises) meanders the Kyi-ch'u, whose azure bends encircle the hill with a network green as the dark green bamboo; it is so lovely that it drives all cares away from the beholder."

In 641 A. D., the powerful Tibetan king Srong-btsan sgam-po married a Chinese princess, the daughter of the Emperor T'ai-tsung of the T'ang dynasty. The story of his wooing of the princess has been made by the Tibetans into a poetical romance in which we find such well-known and world-wide motives of popular tradition as the difficult tasks to be solved by the prospective son-in-law.² The candidates for the hand of the princess were many, so the emperor decided that he should obtain her who could best stand a number of tests. One of these was that he laid before the assembled delegates a buckler constructed of a coil of turquoise arranged in concentric circles so that one end of it just formed the center; he required that a silk thread should be passed through the apertures of the turquoises from one end of the coil to the other. Nobody could solve the puzzle except the astute Tibetan minister *Gar* who caught a queen-ant and fed it well with milk until it grew bigger. Then he tied a silk thread to its waist, fastening the end of the thread to a silk band which he held in his hand, and placed the ant in the perforation of the first turquoise, gently blowing into the hole, till to the amazement of the lookers-on the ant came out at the other end of the coil dragging the thread along.³

¹ According to the translation of W. W. ROCKHILL, *Tibet from Chinese Sources* (*Journal Royal Asiatic Society*, Vol. XXIII, 1891, p. 76).

² Compare R. H. LOWIE, *The Test-theme in North American Mythology* (*Journal of American Folk-lore*, Vol. XXI, 1908, pp. 97-148).

³ Narrated in the Tibetan Annals of the Kings of Tibet (*rgyal rabs*, manuscript in the writer's possession), Chapter 13, fol. 45a.

The word "turquoise" (*gyu*) has become a favorite attribute to designate a sky-blue color; "turquoise-lake" (*gyu mts'o*) may be called poetically any blue-glittering lake, but is also the constant epithet of wells and certain favorite lakes, as, for example, for the sacred Manasarovara Lake or the Lake of Yar-brog (Yamdog).¹ Also flowers, the manes of horses, and even bees and tadpoles are described in the same manner; the hair of goddesses and the eyebrows of children born in a supernatural way are called turquoise-blue; also the beauty of the body of such beings is compared to the turquoise. In Spiti the forget-me-not is called *yu-zung men-tog*, that is, the flower whose essence or main substance is turquoise.² In ancient mythology "thirteen turquoise heavens" are mentioned, and as we speak of the Blue of Heaven, or the sky, the Tibetans say poetically "the turquoise of Heaven." In a Tibetan legend, a poetical description of the country is given as follows:³

"At the foot of the giant mountains (the Himalaya) supporting the sky, lakes and flowing streams gather, forming plains of the appearance of turquoise, and glittering pyramids of snow-clad crystal rise. This mountain range spreading like a thousand lotus flowers is white and like crystal during the three winter-months; during the three months of the summer it is azure-blue like turquoise; during the three months of the autumn it is yellow like gold, and in the moons of the spring, striped like the skin of the tiger. This chain of mountains, excellent in color and form, and of perfect harmony, is inexhaustible in auspicious omens."

This passage is very interesting as revealing the innate nature-love of the Tibetan people and showing the connection of the colors of their favorite gems with the general colors of nature in the course of the seasons.⁴ With the majority of the people, turquoise is favorite, coral

¹ Also in the ancient Egyptian texts, the word turquoise is used as a designation for the color of water. "Praises shall be offered unto thee in thy boat, thou shalt be hymned in the *Ātet* boat, thou shalt behold *Rā* within his shrine, thou shalt sit together with his disk day by day, thou shalt see the *Ant* fish when it springeth into being in the waters of turquoises, and thou shalt see the *Abtu* fish in his hour."—Hymn to the God *Rā*, in the Book of the Dead, by E. A. WALLIS BUDGE, Vol. I, 1901, p. 78. Interesting studies pertaining to the color of Tibetan lakes and rivers have been made by HERMANN V. SCHLAGINTWEIT, *Untersuchungen über die Salzseen im westlichen Tibet*, pp. 71 *et seq.* (*Abhandlungen der bayerischen Akademie*, München, 1871).

² In this case the word *zung* is to be written *gzung*. A. H. FRANCKE (*Ladakhi Songs*, p. 13. Reprinted from *Indian Antiquary*, 1902) has proposed to adopt the spelling *zung* in the sense of *chung* "small," so that the name would mean "flower of small turquoises."

³ Compare I. J. SCHMIDT, *Geschichte der Ost-Mongolen*, p. 465 (St. Petersburg, 1829). In another passage (p. 439) it is said: "On the plain where diamond rocks glitter is a lake with a mirror like turquoise and gold." See also p. 484.

⁴ In a Tibetan poem depicting the labors of husbandry (*So-nam bya ts'ul-gyi leu*, published in the Tibetan School Series, No. II, Calcutta, 1890), the awakening of the spring is described, and the first buds on the uppermost branches of the trees are compared with the glimmer of emeralds; the flowers with antlers appear as vomiting sapphires; the great earth is teeming with sap, and resembles the malachite in its medley of blue and green colors.

and amber rank next. The blue, green, and blue-green; the red, rose, and pink; the yellow and brown of these three substances are indeed those tinges which most frequently occur among the flora of the Tibetan plateaus. During the summer, large patches of blue, red and yellow flowers abound on the fine pasture lands, and at this sight I could never suppress the thought that the enthusiasm of the Tibetans for turquois, coral and amber must have been suggested and strengthened by these beautiful shades of their flowers which their women as readily use for ornament as stones; indeed, it seems to me, as if owing to its permanency, the stone were only a substitute for the perishable material of the vegetable kingdom.

Turquoises, usually in connection with gold, belong to the most ancient propitiatory offerings to the gods and demons;¹ in the enumeration, gold always precedes turquois as the more valuable gift. They also figure among the presents bestowed on saints and Lamas by kings and wealthy laymen. The thrones on which kings and Lamas take their place are usually described as adorned with gold and turquoises, and they wear cloaks ornamented with these stones. It may be inferred from traditions and epic stories that in ancient times arrowheads were made not only of common flint, but also occasionally of turquois to which a high value was attached. A powerful saint, by touching the bow and arrow of a blacksmith, transforms the bow into gold, and the arrowhead into turquois.² The hero Gesar owns thirty arrows with notches of turquois.³

In the popular medicine of the present time turquois is, as far as I know, not employed; but it is officially registered as a medicament in several medical standard works derived from or modeled after Sanskrit books. There we meet the typical series of ten substances: gold, silver, copper, iron; turquois, pearl, mother-o'-pearl, conch, coral, lapis lazuli.⁴ Turquois is credited, as we saw above, with removing poison, and heat in the liver. It seems almost certain that this notion is taken from Indian lore; we remember the words of Narahari that every poison is rapidly neutralized by it, and that it relieves pain caused by demons. Also in the list of 365 drugs published in Tibetan and Chi-

¹ LAUFER, Ein Sühngedicht der Bonpo (*Denkschriften der Wiener Akademie*, 1900, No. 7, p. 35); SCHLAGINTWEIT, Die Könige von Tibet, p. 837; A. H. FRANCKE, *Journal Asiatic Society of Bengal*, N. S., Vol. VI, 1910, p. 408.

² LAUFER, Roman einer tibetischen Königin, p. 153 (Leipzig, 1911).

³ I. J. SCHMIDT, Die Taten Bogda Gesser Chan's, p. 283 (St. Petersburg, 1839).

⁴ This series occurs also in the Compendium of Tibetan Medicine translated from the Mongol into Russian by A. POZDNEJEV, Vol. I, p. 247 (St. Petersburg, 1908).

nese by the Peking apothecary *Wan I*,¹ turquoise is listed as a medicament, in the same series as given above.

A curious utilization of turquoise is mentioned in the Biography of Padmasambhava (Ch. 53) who is said to have availed himself of gold, silver, copper, iron, lapis lazuli, turquoise and minium inks for writing on light-blue paper of the palmyra palm and on smoothed birchbark.² Whether it is technically possible to use turquoise for the coloring of ink I am not prepared to say; perhaps "turquoise" is merely a designation for the blue or green color of the ink.

It seems doubtful whether in ancient times the turquoise was considered a precious stone by the Tibetans. There is an old enumeration of jewels in the Annals of the Tibetan Kings (*rgyal rabs*, fol. 7) where the two classes, jewels of the gods and jewels of men, are distinguished, each class forming a series of five. The former comprises: 1. *indranīla*, 2. *indragopi*, 3. *mt'on-ka*, 4. *mt'on-ka ch'en-po*, and 5. *skong-mdzes*. The first two are Sanskrit words; No. 1 is the sapphire; No. 2 a kind of ruby; the word under 3 denotes the color of indigo and corresponds to Sanskrit *nīla* which is a general designation of the sapphire; also the next under No. 4 meaning "the great blue one" = Sanskrit *mahānīla*, denotes a superior quality of sapphire;³ the signification of the stone No. 5 is unknown. The five jewels of men are gold, silver, pearls, lapis lazuli (*mu-men*), and coral. The turquoise does not occur in this group, presumably for the reason that it was not classed among precious stones. It has never been, even in times of old, a stone of any exaggerated value. Among the presents made by the ancient kings of Tibet to the emperors of China we find stones like lapis lazuli and rubies (*padmarāga*), but no mention of turquoise; likewise, in the lists of tribute

¹ Regarding this work compare BRETSCHNEIDER, *Botanicon Sinicum*, pt. 1, p. 104 (Shanghai, 1882). There are several editions of this interesting small work, in Chinese and Tibetan style.

² LAUFER, *Roman*, p. 249. Also in the History of the Kings of Ladakh (A. H. FRANCKE's translation in *Journal Asiatic Society of Bengal*, N. S., Vol. VI, 1910, p. 405) writings in gold and turquoise are attributed to five wise men in mythical times.

³ Buddhahatṭa (FINOT, *Les lapidaires indiens*, p. 41) explains *indranīla* as a sapphire the interior of which has the lustre of the rainbow colors, and which is rare and highly priced, and *mahānīla* as a sapphire with a color so intense that, thrown into milk of a volume a hundred times larger, it colors it like indigo. — "Sapphires of various colors occur in India. Thus, there is the blue or true sapphire of popular language, the color of which may be any shade of blue, from the palest to a deep indigo, the most esteemed tint being that of the blue cornflower. Violet sapphires (oriental amethysts) are also found in the same localities as those in which the true sapphire is met with. The most valuable sapphire found in the East Indies is the yellow sapphire or oriental topaz. A green gem, called by the Europeans in India an emerald, is often seen. It is, however, a green sapphire, and is much harder than the true emerald, which is a green beryl" (G. WATT, *A Dictionary of the Economic Products of India*, Vol. VI, p. 474).

sent by the Dalai Lamas to the emperors of China such gifts figure as silk scarfs, bronze images, relics, coral, amber, pearls, incense and woolen stuffs, but turquoise does not appear.

In the religious service turquoises are employed, strung in the shape of beads, for rosaries, 108 beads being the usual number. The complexion of the god or goddess to be worshipped sometimes determines the selection in the color of the rosary-beads. Thus a turquoise rosary is occasionally used in the worship of the popular goddess Tārā of whom there are two principal forms, one of these being conceived as of a bluish-green complexion.¹

Turquoises are, further, offered on the altars of the gods, and their brass or copper images are adorned with them. Buddhist images, thus treated, may readily be recognized as Lamaist deities, as the Chinese never adopt this method. The number of stones set in an image varies according to its dimensions, and may reach from a half dozen up to a hundred and more. In any case, however, this is not intended as a mere ornamental addition, but the turquoises are to signify the actual jewelry with which the deities are adorned, and which form part of their essential attributes. One of the finest monuments in Tibet is the sarcophagus of the first Pan-ch'en Lama in the monastery of Tashilhunpo near Shigatse. It is of gold, covered with beautiful designs of ornamental work, and studded with turquoises and precious stones. The turquoises, says Captain RAWLING,² who has photographed this gorgeous monument, appear to be all picked stones, arranged in patterns, and in such profusion as to cover every available spot, including the polished concrete of the floor. In the oldest temple founded in Tibet about the middle of the eighth century, bSam-yas, which is described at full length in the Annals of the Tibetan Kings, there was a shrine in which the beams are said to have been of turquoise; figures of galloping horses of gold were affixed to them, while there were other beams of gold with dragons of turquoise attached.³ This is the earliest Tibetan record regarding carvings from this stone; if the beams of turquoise are not merely a metaphor of speech, it may be realized that the turquoises were inlaid in a kind of mosaic.

In the pictorial art of Lamaism jewels take a prominent place. On the first scroll in a set of twelve pictures (in the collections of the Field Museum, Nos. 121,371-382) representing the Eighteen Sthavira or Arhat and the portraits of the Dalai Lamas, we see as the central figure

¹ Compare L. A. WADDELL, *The Buddhism of Tibet*, p. 209 (London, 1895).

² *The Great Plateau*, p. 184 (London, 1905).

³ *T'oung Pao*, 1908, p. 33.

Buddha Çākyaṃuni holding the alms-bowl of lapis-lazuli color.¹ On the altar in front is depicted a golden bowl containing rubies, lapis lazuli, white conch-shell and turquoise. In the foreground is a lotus-pond with three flowers widely unfolded; on the central one three gems of oblong form are figured, — lapis lazuli, turquoise, and ruby, emblematic of the well-known prayer formula *Om māṇi padme hūm* ("Oh, the jewel in the lotus!") and of the three precious objects (Sanskrit *triratna*), which are Buddha, his doctrine, and the clergy. In the upper portion of the same painting, two of the Arhat are represented, Aṅgaja and Vakula, the latter holding and stroking an ichneumon which has the ability of spitting jewels; they are gradually dropping into a plate.² A tribute-bearer of grotesque racial type is offering to the saint gems in a bowl containing an ivory tusk, a coral-branch, and precious stones of blue, green, rose and pink colors. This is not the only Arhat to whom

¹ The alms-bowl (*pātra*) of the historical Buddha was a plain pot; the miraculous relics of later times which were passed off as Buddha's alms-bowl form an interesting subject for the historical mineralogy of the East. The general history of the bowl or bowls has been traced by H. KERN (Manual of Indian Buddhism, p. 90) and H. YULE (The Book of Ser Marco Polo, Vol. II, pp. 328–330). Here, only the different materials should be pointed out. Fa Hien who started for India in 399 saw the bowl in Peshāwur (Purushapura) and describes it as being "of various colors, black predominating, with the seams that show its fourfold composition distinctly marked" (LEGGE, Record of Buddhistic Kingdoms, p. 35). The latter clause in Legge's rendering does not seem to be quite correct; but however this may be, Fa Hien's account, it seems to me, bears out the fact that the bowl seen by him was carved from onyx in various layers in the style of cameo-work (compare G. WATT, *l. c.*, Vol. II, p. 174). Hsüan Tsang (St. JULIEN, Mémoires sur les contrées occidentales, Vol. I, p. 106; S. BEAL, Buddhist Records of the Western World, Vol. I, p. 99) speaks of the *pātra*, but does not furnish a description of it. Li Shi of the T'ang period (not of the twelfth century, as WYLIE, Notes on Chinese Literature, p. 192, says), in his *Sū po wu chi* (Ch. 10, p. 2; ed. of *Hu-pei tsung wên shu chü*), makes the statement that Buddha's alms-bowl in Peshāwur was of blue (or green) jade (*ts'ing yü*), or in the opinion of others of blue (or green) stone (*ts'ing shi*); then the text of Fa Hien is reproduced. In view of the ultramarine color in which the Buddhist alms-bowls appear on paintings in China and Tibet, it is permissible to think in this case of lapis lazuli; indeed, the word *ts'ing shi*, in this sense, is used in the *Wei lio* (HIRTH, China and the Roman Orient, p. 72). A still earlier reference to Buddha's alms-bowl in the country of the Ta Yüe-chi, already pointed out by F. HIRTH (Chinesische Studien, p. 251) is contained in the commentary to the *Shui king* written by Li Tao-yüan who died in 527 (his biography in *Pei shi*, Ch. 27) where likewise the term *ts'ing shi* is employed, and I concur with Hirth in the opinion that it should be translated in this case by lapis lazuli. In Tibetan portrait-statues of bronze, the alms-bowl is often actually represented and carved from lapis lazuli (A. GRÜNWEDEL, Mythologie des Buddhismus, p. 79), as the outcome of the tradition that the mendicant's platter brought from Nepal to Tibet by the princess K'ri-btsun in the seventh century and working many miracles was made of lapis lazuli (S. CHANDRA DAS, Narrative of a Journey round Lake Yamdo, p. 79, Calcutta, 1887). According to MARCO POLO (YULE's edition, Vol. II, p. 320) the dish of Buddha brought to China for Emperor Kubilai from Ceylon was "of a very beautiful green porphyry," while YULE quotes a Chinese account written in 1350 to the effect that the sacred bowl in front of the image of Buddha in Ceylon was neither made of jade, nor copper, nor iron, but that it was of a purple color, glossy, and when struck sounding like glass.

² The same attribute of the jewel-spitting ichneumon (Sanskrit *nakula*) appears in the hands of Kubera, the God of Wealth, guarding the northern side of the world mountain Sumeru.

precious stones are offered, but it is the case also with many others. It is interesting that these tribute-bearers are usually people from Central Asia with unmistakable racial features and appropriate costume, or even turbaned Mohammedans. We find the same figures also on the corresponding Arhat paintings of the Chinese and Japanese, and they are doubtless intended to express the important rôle which Iranians, Turks and Arabs have played in transmitting to the East the precious stones of western Asia.

In the marriage ceremony when the bridal party has arrived at the gate of the bridegroom's house, the officiating priest recites a few benedictory verses, describing the house of the bridegroom: "May there be happiness to all living beings! The lintel of this door is yellow, being made of gold. The door posts are cut out of blocks of turquoise. The sill is made of silver. The door frame is made of lapis lazuli. Opening this auspicious door, you find in it the repository of five kinds of precious things. Blessed are they who live in such a house."¹ This is certainly an ideal or poetical description. In a more ancient marital ceremony described in the Tibetan dramatic play *Nang-sa*, "the turquoise sparkling in rainbow tints" is tied to the end of an arrow adorned with streamers of five-colored silk which is fastened to the back of the bride to fix the marriage tie.² In Ladakh, the bride generally receives, on her wedding day, many of the turquoises which her mother had worn.³

To describe all objects in which turquoise is employed would mean to survey the whole range of Tibetan ethnography, which is certainly beyond the scope of these notes.⁴ But reference should be made to the beautiful Tibetan swords in which the hilts and sheaths worked in repoussé gold or silver are inlaid with large turquoise and coral beads. This is an ancient technique practised also by the Turks of Central Asia and the Persians.⁵

So little is known about the localities in Tibet where turquoise is found that there have even been authors who doubted its indigenous occurrence.

¹ S. CHANDRA DAS, *Marriage Customs of Tibet*, p. 12.

² L. A. WADDELL, *Buddism of Tibet*, p. 557 (London, 1895).

³ A. H. FRANCKE, *Ladakhi Songs*, p. 13.

⁴ For illustrations see Plates I-V. The Field Museum possesses a rich collection of Tibetan, Nepalese and Chinese jewelry which will give occasion at some future date for a study in decorative and industrial art. The Tibetan process of covering a gold or silver foundation with a mosaic of turquoise agrees with the similar technique practised in Siberia during the bronze age, and therefore becomes an historical factor of great importance.

⁵ Compare the Sassanian sword reconstructed by J. DE MORGAN (*Mission scientifique en Perse*, Vol. IV, p. 321, Paris, 1897) the shape of which is strikingly identical with the Tibetan sword.

A. CAMPBELL, in his "Notes on Eastern Tibet,"¹ has the following remarks in regard to turquoises:

"A great merchant of Tibet named Chongpo, who traded ages ago with India, and once crossed the seas beyond India, brought the finest real turquois to his native country. From that time the stone has been known there, and like coined money, it continues to circulate in the country as a medium of exchange. The imitations brought from China are made of common earthen-colored or other compositions. They are easily detected. Those imported via Cashmere are real stones, but not valuable. The only test of a real stone is to make a fowl swallow it; if real, it will pass through unchanged."

This tradition, if at all correct and not rather founded on a misunderstanding, carries little weight. The word *Chongpo* is not a Tibetan proper name, but simply denotes "a dealer, a trader." There is no evidence of the occurrence of turquoises in India proper; the people of India became acquainted with them from Persia only late in the middle ages through Mohammedan influence, and as shown above, they are first mentioned in Sanskrit literature in the beginning of the fifteenth, possibly also in the thirteenth, century. Thus, there is little or no plausibility in the assumption that India could have given the impetus to the introduction of the turquois into a country where almost every individual is in possession of these stones, and where a general national passion for them is developed among all people high and low, which can have been but cultivated for many centuries and ages. This is corroborated by the facts of language and history, and further by the evidence of localities in Tibet where, in fact, turquois occurs *in situ*.

MARCO POLO,² speaking of the province of Caidu, which is identical with the western part of the present Chinese province of Sze-ch'uan, a territory largely inhabited by Tibetan tribes, mentions besides a lake in which are found pearls, also a mountain in that country "wherein they find a kind of stone called turquois, in great abundance, and it is a very beautiful stone. These also [in the same way as the fishing of the pearls] the Emperor does not allow to be extracted without his special order." Yule remarks that Chinese authorities quoted by Ritter mention mother-o'-pearl as a product of Lithang, and speak of turquoises as found in Djaya (or Draya) to the west of Bathang. This latter notice is quite correct and furnished by several Chinese authors who have visited Tibet and written on the subject.³ They further mention Ch'amdo, that is, not only the small town in Eastern Tibet so

¹ *The Phoenix*, ed. by J. SUMMERS, Vol. I, p. 143 (London, 1870).

² *The Book of Ser Marco Polo*, ed. by YULE and CORDIER, 3d ed., Vol. II, p. 53 (London, 1903).

³ W. W. ROCKHILL, *Tibet from Chinese Sources (Journal Royal Asiatic Society, Vol. XXIII, 1891, p. 272)*.

called, but the whole district in which it is situated, and the territory of the capital Lhasa as places for the production of turquois; this locality seems to be particularly rich in this respect, and we have seen that the largest turquois of his time was discovered in the beginning of the eighth century by a Tibetan king on a hill north of Lhasa.

I have searched through the Chinese Annals of the Mongol or Yüan Dynasty (*Yüan shi*) for a confirmation of Marco Polo's report regarding the imperial turquois monopoly. Though my efforts have not as yet been crowned with success, I do not give up the hope that such an account will be discovered in the future either in this or in some of the other Chinese works treating of the history of the Mongol period. The turquois, however, is repeatedly alluded to in the *Yüan shi*, as we shall note hereafter.¹

The first European author to report the indigenous occurrence of turquois in Tibet proper, as far as I know, is the Capuchin Friar FRANCESCO ORAZIO DELLA PENNA DI BILLI in his "Breve Notizia del Regno del Thibet" written in 1730.²

According to SARAT CHANDRA DAS,³ the finest turquoises are obtained from a mine of the Gangs-chan mountains of Ngari-Khorsum

¹ For the rest, there can be no doubt of the correctness of Marco Polo's statement. The turquois monopoly was the outcome and a part of all other exclusive prerogatives of the emperor extending to all precious metals and stones (compare in particular MARCO POLO, Vol. I, p. 424). This monopoly of the Mongols forms a counterpart to the turquois monopoly of the Persian Shahs related by J. B. TAVERNIER (ed. V. BALL, Vol. II, p. 104): "For many years the king of Persia has prohibited mining in the 'old rock' for any one but himself, because having no gold workers in the country besides those who work in thread, who are ignorant of the art of enamelling on gold, and without knowledge of design and engraving, he uses for the decoration of swords, daggers, and other work, these turquoises of the old rock instead of enamel, which are cut and arranged in patterns like flowers and other figures which the jewelers make. This catches the eye and passes as a laborious work, but it is wanting in design." According to the opinion of the Persian General C. HOUTUM SCHINDLER who about 1880 was for some time governor of the mining district and acting manager of the mines, operations were probably carried on by the Persian Government up to 1725 (M. BAUER, *Precious Stones*, p. 394). On Schindler's work see p. 42.

² First edited by J. KLAPROTH in the *Nouveau Journal asiatique*, 1835 (the passage referred to on p. 32 of the separate issue: "pierre turchine"). English translation in C. R. MARKHAM, *Narratives of the Mission of George Bogle to Tibet etc.*, p. 317, (London, 1876). I may be allowed to point out that the word "cobalt" in the English version, preceding the turquois stones, is based on a mistranslation of Orazio's *azzurro* (present spelling *azzurro*) which is lapis lazuli. Indeed, this Italian word is traced to the Persian and Arabic names of lapis lazuli, *lazward* and *läzuward*. We know that this mineral is found in several localities of eastern Tibet (Lho-rong Dzong and Kung-pu Chiang-ta) and in the district of Lhasa (ROCKHILL, *Journal Royal Asiatic Society*, Vol. XXIII, 1891, pp. 272-4, and TIMKOWSKI, *Reise nach China durch die Mongolei*, Vol. II, pp. 188, 189, Leipzig, 1826), but it may be doubted that cobalt occurs in Tibet (though it may be found in Sikkim, as stated by J. C. WHITE, *Sikhim and Bhutan*, p. 322, London, 1909).

³ *Tibetan-English Dictionary*, p. 1152.

(West Tibet).¹ This is also corroborated by the historical fact that the kings of Ladakh received a tribute of turquoises from Guge.²

From my own experience I may say that according to information received in Tibet turquoise occurs in several mountains of the great State of Derge in eastern Tibet, though my Tibetan informants were unable to state the exact localities (or, which is more probable, did not want to state them). At any rate, the fact cannot be called into doubt, for in Derge, celebrated for the high development of art-industries and its clever craftsmen, also fine carvings of turquoise are turned out, of which several specimens were secured by me that exhibit a peculiar, very pleasing, soft apple-green tinge differing from any other kind met in Tibet and China, and seemingly coming nearer to the Mexican variety. It seems also that in the mountains to the north of Ta-t sien-lu in western Sze-ch'uan a turquoise of inferior quality and a sickly green is obtained; it is, however, so poor and insignificant that the Chinese traders there accustomed to the brilliant blue of their home product look down upon it as spurious. A great many of these greenish stones are utilized in a large collection of Tibetan silver jewelry brought together by me in that town. I was first inclined to accept the opinion of the Chinese consulted by me, and to regard these stones as imitations, but DR. JOSEPH E. POGUE to whom I sent three specimens for examination convinced me that this opinion was unfounded. He writes as follows:

"The three specimens give the following specific gravities (theoretical for turquoise is 2.6 — 2.83):

- | | |
|--|------|
| 1. Small dark-green specimen..... | 2.71 |
| 2. Small light-green specimen..... | 2.81 |
| 3. Larger perforated green specimen..... | 2.68 |

All three specimens are phosphates, giving good tests. Washed with strong ammonia, they did not lose their color, as most artificially colored turquoises will do when so treated. The specimens reacted characteristically when heated; and when viewed under the microscope, one contains a little granular quartz attached to its edge."

Captain C. G. RAWLING³ gives the following summary as the result of his inquiry about the occurrence of turquoise in Tibet:

"The rough stones are bought at the fairs held in the country and conveyed by the Indian merchants to Amritsar and Delhi, where they are mounted in gold and silver, and afterwards reimported. Practically every matrix originally comes from Tibet, but though inquiries were made at all the more important places, no information could be obtained as to the situation of the mines. The Phari people obtain their

¹ That is, the three districts of Ngari comprising the territories of Rutok, Guge, and Purang. *Gangs-chan* means the glacier-mountains.

² SCHLAGINTWEIT, *Die Könige von Tibet*, p. 862.

³ *The Great Plateau*, p. 294 (London, 1905).

supply from Calcutta, Shigatse from Lhasa, whilst at many other places the people merely said that they did not know where the stones came from, that they had had theirs for years, and that none were to be found in their district or anywhere near. Despite these unsatisfactory answers, the consensus of opinion leads one to believe that they exist in the greatest numbers in the country situated between Lhasa and the western border of China."

I am somewhat doubtful in regard to Rawling's point that Tibetan turquoises are worked up in India and find their way back into Tibet. I am rather under the impression that the reverse is the case, as already stated by GEORGE C. M. BIRDWOOD¹ that a good deal of Tibetan jewelry is imported into India through Bhutan, Sikkim, Nepal, and Cashmir, chiefly in silver — ornamented with large, crude turquoises, and sometimes with coral — in the shape of armlets, and necklaces, consisting of amulet boxes, strung on twisted red cloth, or a silver chain, and in various other forms, such as bracelets, anklets, etc., hammered, cut, and filigrained.

I have carefully gone over four volumes of the Trade Statistics of the Government of Bengal.² Turquoise is not specified in these columns; it cannot, therefore, claim a big share in the trade between Bengal and Tibet. There is, however, a general item: Jewelry, and Precious Stones and Pearls. Jewelry was imported into Bengal from Tibet in 1906-7 at the value of 56 Rupees, precious stones and pearls, unset, at the value of 2,923 Rupees. The export of the latter from Bengal into Tibet for the same year amounted to 27,329 Rupees, in the preceding year, 1905-6, to 32,112 Rupees, in 1904-5, to only 12,460 Rupees (probably owing to Younghusband's expedition). I do not know how large a share is due to turquoise in these figures.³

OSVALDO ROERO⁴ gives a list of merchandise imported into Ladakh from the official register kept by the customs of Leh, the capital of Ladakh. Among the products there enumerated he enlists turquoises as coming from Persia by way of Bokhāra, the best and most valuable coming from Seistān. The same view that turquoises are imported into Ladakh from Persia through Bokhāra had previously been upheld by ALEXANDER CUNNINGHAM.⁵ H. RAMSAY⁶ enumerates three classes

¹ The Industrial Arts of India, Vol. II, p. 28.

² The Trade of Bengal with Nepal, Tibet, Sikkim, and Bhutan. Last volume published, Calcutta, 1907.

³ There is a pretty lively trade in turquoises on the part of Tibetans in Darjeeling; the stones sold there come from Tibet and China (via Tibet). In most cases it is possible to discriminate between turquoises of Tibetan and Chinese origin.

⁴ Ricordi dei viaggi al Cashemir, Piccolo e Medio Tibet e Turkestan, Vol. III, p. 72 (Torino, 1881).

⁵ Ladak, p. 242 (London, 1854). Also in Gilgit the turquoise is employed (J. BIDDULPH, Tribes of the Hindoo Kush, p. 74, Calcutta, 1880).

⁶ Western Tibet: A Practical Dictionary, p. 162 (Lahore, 1890).

of good turquoises which are free from flaws and with very little green, while inferior kinds are known as "Tibetan" and "Chinese turquoises," which come to Ladakh from Lhasa or China; they are full of flaws and generally very green. The latter remark holds good only for Tibetan stones, as the Chinese are usually azure-blue. "The best turquoises," concludes RAMSAY, "come up from India. Ladakhis object to flaws, but they like a little green, as they consider it a sort of guarantee that the turquois has not been manufactured."

In the following notes on China it will be seen that large quantities of turquoises cut into stones or beads and worked into carved objects are imported nowadays from China into Tibet; they are largely used by Chinese traders for purposes of barter with the Tibetans.

III. TURQUOIS IN CHINA

The turquois, though found at present in central China *in situ* and commercially exploited by Chinese traders for export trade into Tibet and Mongolia, is not generally known to the Chinese people, for the apparent reason that it is but little employed by them and plays no significant part in their life.¹ Outside of Peking and Si-ngan fu, where the trade is monopolized by a few of the initiated, the stone is hardly familiar to the people at large, nor to the educated classes; in Shanghai, Hankow, and Canton, it is entirely unknown. This is glaringly evidenced by the fact that the Chinese commission engaged in working up the "English and Chinese Standard Dictionary," published by the Shanghai Commercial Press, in 1908, is not even acquainted with their own Chinese name for the stone, and speaks of it as a substance entirely foreign to their country; their definition of turquois (Vol. II, p. 2442) is "a Persian gem of a greenish-blue color, etc., first known to Europe through Turkey," and the same translated literally into Chinese, without giving the proper Chinese term for the stone. Traders who have come in contact with Tibetans or Mongols or even settled among these peoples are certainly acquainted with it, and may even be induced to wear a turquois button, but a "barbarous" odor is always attached to it, and it seldom enters the ornaments of a self-respecting Chinese woman.

Besides the HON. W. W. ROCKHILL, S. WELLS WILLIAMS² seems to be the only author to mention turquoises as known to the Chinese. It is somewhat hard to understand how other careful observers could

¹ It follows therefrom that the knowledge of the turquois in China cannot be very old, and this conclusion will be confirmed by our historical inquiry.

² The Middle Kingdom, Vol. I, p. 310 (New York, 1901).

have overlooked its presence. F. v. RICHTHOFEN,¹ who gives a fairly complete summary of the commerce of Si-ngan fu does not mention it, nor does he notice it in his enumeration of goods traded from China to Tibet (p. 133). As far as I am aware, no handbook on mineralogy or precious stones makes any reference to the Chinese turquois; it is not noted either by F. DE MÉLY in his otherwise very complete work "Les lapidaires chinois."

The present Chinese name for turquois is *lü sung shi*, that is, "green fir-tree stone," or *sung êrh shi*² (also *sung-tse shi*) that is, fir-cone stone. This name must not be confounded with the designation *sung shi*, "fir-tree stone," which is not a stone, but by which petrified pieces of the fir-tree are understood; these are also called *sung hua shi*, "fir-tree transmutation stones," but their very color description as being yellow or purple shows sufficiently that they are entirely distinct from turquois. It will, however, be useful to consider briefly what Chinese authors have to say in regard to these petrefacts, because from these statements we shall gain a clue to the understanding of their name for turquois.

The earliest trustworthy mention of such petrefacts of vegetal origin is made in the "Annals of the T'ang Dynasty" (618-906 A. D.; *T'ang shu*, Ch. 217 B, p. 5) compiled from the records of the dynasty by Ngou-yang Siu (1007-1072) and Sung K'i (998-1061)³ and completed in 1060. This notice embodied in the chapter on the Uigur (*Hui-hu*) relates to Central Asia, more particularly to the region inhabited by the tribe Bayirku (*Pa-ye-ku*),⁴ and runs as follows:

"The country is grassy and produces noble horses and fine iron. There is a river called K'ang-kan. The people cut up fir-trees and throw the pieces into the water. In the course of three years these alter into blue-colored stone, in which the marks of

¹ Letters, p. 108.

² In the Cantonese dialect *luk ts'ung shek* and *ts'ung i shek*, respectively. The words with this meaning will be found in the Chinese-English Dictionaries of EITEL and GILES, and in the Chinese-Russian Dictionary of PALLADIUS; COUVREUR and others do not give them. The translation by turquois is confirmed by the Great Imperial Dictionary in Four Languages, which has the series: Chinese *lü sung shi*, corresponding to Manchu *nyu*, Tibetan *gyu*, and Mongol *ugyu*, all of which refer to the turquois. In a description of Tibet (*Wei ts'ang t'u chi* by Lu Hua-chu, published in 1785) occurs also the expression *sung jui* (No. 5723) *shi*, "stone of fir-tree buds." The German-Chinese Dictionary published by the Catholic Missionaries of South-Shantung (p. 916, Yen-chou fu, 1906) gives for turquois the word *lü sê shi*, "green-colored stone." G. SCHLEGEL (*Nederlandsch-chineesch woordenboek*, Vol. IV, p. 232, Leiden, 1890), besides the common *sung êrh shi*, registers for "turkoois" the word *ts'ing yü*, that is, blue or green jade. This must be an artificial modern formation, or rather an error, as the Chinese have never ranged turquois among jade but solely among ordinary stone, on which more will be said farther on.

³ GILES, Biographical Dictionary, pp. 606, 698.

⁴ CHAVANNES, Documents sur les Tou-kiue (Turcs) occidentaux, p. 88 (St. Petersburg, 1903).

the wood are still preserved in delicate outlines. It is generally called K'ang-kan stone."¹

In 767 A. D. the painter Pi Hung is said to have executed a wall-painting on which fossil fir-trees were depicted, evoking poetical eulogies on the part of admirers.²

The Taoists, with their interest in the beauties and wonders of nature, could not fail to seize this attractive subject, and to interpret the phenomenon. The *Lu i ki* (*Ko chi king yüan*, Ch. 7, p. 6), a fabulous book by the Taoist monk Tu Kuang-t'ing of the tenth century,³ reports:

"In a pavilion on a mountain in Yung-k'ang hien in Wu chou (the modern Kin-hua fu in Chê-kiang Province) there are rotten fir-trees. If you break a piece off, you will find that it is not decayed in the water but a substance altered into stone which previously was not yet transformed in that manner. On examining the pieces in the water, they turn out to be transformations of the same character. These metamorphoses do not differ from fir-trees as to branches and bark; only they are very hard."⁴

¹ Compare D'HERBELOT, Bibliothèque orientale, Vol. IV, p. 165 (La Haye, 1779). The Chinese cyclopædias quote this passage very inaccurately and with arbitrary changes. *Ko chi king yüan* (Ch. 7, p. 6), for example, writes the name of the river K'ang-tse, omits a whole sentence and adds at the end: "The stone has the designs of a fir-tree."

² *P'ei wên yüan fu*, Ch. 100 A, p. 21 b.

³ Compare WYLIE (Notes on Chinese Literature, p. 200) who dates this author in the tenth century (likewise p. 221). The *Lu i ki* has been adopted into the Taoist Canon (L. WIEGER, Le canon taoïste, p. 111, No. 586); Dr. WIEGER, however, places the work and the author in the ninth century. M. PAUL PELLIOU (*Journal asiatique*, 1912, *Juillet-Août*, p. 149) fortunately sheds light on the matter by informing us that Tu Kuang-t'ing lived toward the close of the T'ang dynasty, and that all his works come down from the beginning of the tenth century. BRETSCHNEIDER (*Botanicon Sincicum*, pt. 1, p. 172, No. 492) states that a work with the title *Lu i ki* must have been extant in the sixth century, as it is quoted in a book of that time; but it seems not to be known whether the work there referred to is really identical with the *Lu i ki* of Tu Kuang-t'ing. When WYLIE points out that the productions of this author have forfeited all claim to authenticity, this is certainly correct as regards their historical value. He must not be judged, however, in this light, but should be appreciated as a Taoist recluse and dreamer who reveals to us interesting phases of Taoist psychology by describing visions of dragons, tigers, tortoises, serpents and fishes, or relates extraordinary dreams and strange phenomena happening near the graveyards, who now records the principal hills and lakes of the empire famous as retreats of Taoist devotees, now tells the story of the Wu-i Mountain of Fu-kien renowned for its plantations of tea.

⁴ The *Po wu chi*, a work by Chang Hua (232-300 A. D.) says: "The root of the fir-tree partakes of the nature of stone; stones, when cracked, are dissolved into sand and produce a fir-tree; and a fir-tree, when reaching three thousand years, again alters into stone." The *Po wu chi* was lost during the Sung period and compiled at a later date from extracts embodied in other publications (WYLIE, Notes, p. 192); there is, consequently, no guaranty that any text of this work, as preserved in the present editions, really goes back to the third century.—The above subject has also an interesting bearing on the Chinese knowledge of fossils, which should be treated some day in a coherent essay. There is a great deal of information on dragon bones and teeth originating from fossil hipparion and rhinoceros, petrified fishes, crabs, and swallows, all procurable in the Chinese drug-stores. There are similar accounts among the Arabs (M. REINAUD, *Relation des voyages faits par les Arabes*, Vol. I, p. 21; P. A. VAN DER LITH, *Livre des merveilles de l'Inde*, p. 171), and the palæontologi-

In regard to these petrefacts of Yung-k'ang, another interesting note is given by Tu Wan or Tu Ki-yang in his Treatise on Stones, entitled *Yün lin shi p'u* (Ch. B, p. 3) published in the year 1133 (Sung period), the oldest Chinese *lapidarium* extant.¹ This author speaks of a poet of the T'ang dynasty, Lu Kuei-mêng,² who had obtained a pillow and a lute of stone, and left two poems on these objects. In the introduction to the poems, he mentions the fir-trees of Yung-k'ang which from old age had turned into stones, and that one evening, as the effect of a big rainstorm, a whole fir-tree grove on the mountains suddenly changed into stone, and fell to the ground, smashed into pieces from two to three feet in diameter, and these are still there; the natives of the place, then, carried such pieces away and worked them up into footstools, some as small as a fist, or into low tables by breaking the larger pieces.

Another author, Chang Lu-i, states that "there are two varieties of these stones produced by transformation of fir-trees, one of yellow, and one of purple color, of very fine substance and shape, with water marks on the surface, some also with marks of the tree bark, others with marks of the tree knots, such as occur on the T'ien-t'ai mountains (in T'ai-chou fu, Chê-kiang). There are those the transmutation of which is not complete, but which still bear the fir-tree substance; these are useful as medicine. If those perfectly transformed are taken as medicine, they have the effect upon man that he forgets passion and stops longing; this medicine cures love-sickness; if men or women who are unhappily in love partake of it, they will intercept their thoughts and not remember again." This is certainly a sympathetic remedy; in the same manner as the tree has lost its life and changed into a lifeless mass of stone, so it has the effect on the human heart to make it forget, and to render it cold and old like stone.

cal knowledge of the ancients has been treated by E. v. LASAULX, *Die Geologie der Griechen und Römer*, pp. 6-16 (*Abhandlungen der bayerischen Akademie*, München, 1851).

¹ It is reprinted in the enormous collection *Chi pu tsu tsai ts'ung shu*, Section 28; also in *T'ang Sung ts'ung shu*. This work is widely different from the class of books styled *pên ts'ao*, in which the therapeutic value of the substances occurring in nature forms the principal point of view. The book of Tu Wan is written from the standpoint of economic geography. The minerals are all named for the localities from which they originate, and the author is chiefly interested in their industrial utilization. This feature lends his notes a practical value, and a complete translation of them, aside from the purely scientific interest, might yield also results for the study of economic mineralogy in China.

² He is known as the author of the *Siao ming lu* (WYLIE, *Notes on Chinese Literature*, p. 182) and of a small treatise on the plough (*ibid.*, p. 93, and O. FRANKE, *Kêng Tschü T'u*, p. 45, Hamburg, 1913). BRETSCHNEIDER (*l. c.*, p. 172, No. 493) mentions a work *Poems of Lu Kuei-mêng* as cited in *T'ang shu*, Ch. 196. The Collection of his *Poems (shi tsi)* is quoted in *Kao chai man lu* (Ch. 1, p. 1; *Shou shan ko ts'ung shu*, Vol. 91).

Also the *Pên ts'ao kang mu* (Section on Stones, Ch. 9, p. 14) of Li Shi-chên, the Chinese standard work on materia medica and natural history completed in 1578 after 26 years' labor,¹ mentions the 'fir-tree stone' (*sung shi*) after Su Sung, an author of the Sung period, as being produced in Ch'u-chou fu (Chê-kiang Province) and being like the trunk of a fir-tree but solid stone. According to the opinion of some, it is fir-tree which has changed into stone after a long time; it is gathered a great deal on the mountains, and is made into pillows.²

It seems to me that similar notions have been active in inducing the Chinese to confer on the turquoise the name "green fir-tree stone," because they looked upon it as a transformation from the fir-tree. This may be inferred as a plausible explanation, for as far as I know, there are no definitions of the name in Chinese literature; the word *lû sung shi* can be traced only to the eighteenth century (see p. 60).

A modern author, Chung Kia-fu, in his collected works (*Ch'un ts'ao t'ang ts'ung shu*, 1845, Ch. 29, p. 19) has developed a peculiar view on the origin of turquoise which he places in the same category as amber:

"When the moss growing on rock after many years consolidates and assumes color, turquoises arise, those of a deep hue being called *lû sung*, those light in color *sung êrh* ('fir-tree ears'). This is the same process as takes place with respect to fir-tree resin which after many years consolidates and develops into amber, that of a deep shade being called *hu-p'o*, that light in color being called bees'-wax (*mi-la*).³

¹ The literary history of this interesting work, first printed in 1596, has been traced by BRETSCHNEIDER, *Botanicon Sinicum*, pt. 1, p. 55. Despite many efforts I have not succeeded in procuring the original edition which seems to be entirely lost and not now to exist in any Chinese library. Bretschneider states that the earliest edition extant seems to be that of 1658; but a print of 1645 in 16 vols., edited by Ni Tun-yü of Hang-chou, was secured by me in Tôkyô, now in the John Crerar Library of Chicago, which, besides, has an edition of 1826 in 39 volumes, and one issued in 1885 in 40 volumes, the best print in existence. An excellent photo-lithographic reprint was published in 1908 by the firm *Tsi ch'êng t'u shu* of Shanghai after an edition of 1657 by Chang Ch'ao-lin. The text in the Shun-chi editions is more accurate than in the K'ien-lung and Tao-kuang editions. Prof. HIRTH (*Journal China Branch Royal As. Soc.*, Vol. XXI, 1886, p. 324) mentions a Ming edition printed in 1603, possibly the second edition published.

² A. WYLIE (in his treatise *Asbestos in China: Chinese Researches III*, p. 152, Shanghai, 1897) quotes from the *T'u king*: "Among the hills at Ch'u chou (in Chê-kiang Province) a species of pine stone is produced, resembling the trunk of the pine, but in reality a stone; some say that the pine in the course of time becomes changed into stone. Many people take it to decorate their mountain lodges, and also shape it into pillows." This passage is evidently taken from the *Pên ts'ao kang mu*, the abbreviated title *T'u king* being identical with the *T'u king pên ts'ao* of Su Sung. Compare also F. DE MÉLY (*Les lapidaires chinois*, p. 86, Paris, 1896) where the translation "pour représenter des tranches d'arbres" should read "to represent pillows." On p. 208 DE MÉLY cites an interesting note from DE ROSNY, according to which a fossil pine-tree was found in Japan in 1806.

³ *Mi-la* is the designation for a light-yellow kind of amber in which presumably also copal and artificial productions occur. The Imperial Geography of the Manchu Dynasty (*Ta Ts'ing i t'ung chi*, Ch. 274) ascribes its production to Shi-nan fu in Hu-pei Province, but in another passage connects its introduction with the Hollanders. Other Chinese authors derive the origin of *mi-la* from Yün-nan Province

I once received a water-receptacle to wash writing-brushes in, made from turquois, of the size of a dish, in the shape of lotus-leaves, and onion-green and kingfisher-blue in color."

In the Annals of the T'ang Dynasty (*T'ang shu*), there is a curious word *sê-sê* (No. 9599) occurring in several passages and assumed by HIRTH and CHAVANNES to have the meaning of *turquois*. The one is met with in Ch. 221 B, p. 2 b, in an account of Sogdiana, but relating to the region of Ferghana, where it is said:

"North-east from the capital (modern Tashkend), there are the Western Turks, north-west P'o-la; 200 *li* south one comes to Khojend, 500 *li* south-west to K'ang (that is, Sogdiana, the region of Samarkand). In the south-west is the river Yao-sha (the Yaxartes), and in the south-east are big mountains producing *sê-sê* (or *sê-sô*)."¹

Another passage containing this word will be found in Ch. 256 of the *T'ang shu*, in the account of Tibet.

and Tibet (the Tibetan name is *ko-shel*; in Mongol: *tabarkhai shel*; in Manchu: *meisile*, an artificial hybrid from Chinese *mi* and Tibetan *shel* 'crystal'). In Ch'êng-tu fu, the capital of Sze-ch'uan Province, a number of small girdle-pendants carved from this substance were obtained by me (Yün-nan being given as the place of production) which have not yet been examined as to their composition.

¹ See F. HIRTH, *Nachworte zur Inschrift des Tonjukuk*, p. 81 (in W. RADLOFF, *Die alttürkischen Inschriften der Mongolei*, Vol. II, St. Petersburg, 1899). E. CHAVANNES, *Documents sur les Tou-Kiue (Turcs) occidentaux*, p. 140 (St. Petersburg, 1903) translating the same passage accepts the rendering of Hirth. Also GILES, in the second edition of his Chinese-English Dictionary, sides with this translation. PALLADIUS, who transcribes the word *she-she*, was not of this opinion, for in his excellent Chinese-Russian Dictionary (Vol. II, p. 569) he gives the definition "azure-colored, transparent precious stone." He has likewise another word *she-she* (written with the character No. 9600 in the Dictionary of Giles) with the meaning of "emerald." COUVREUR (*Dictionnaire classique de la langue chinoise*, p. 584) explains *sê-sê*: "nom d'une belle pierre et d'une espèce de verre." In his *Dictionnaire chinois-français* (p. 13), the same author gives the interpretation: "pierre bleue et transparente," and for the plain *sê*: "limpidité d'une pierre précieuse; pur, net." It would be very interesting to have the Chinese source pointed out to which the statements of Palladius and Couvreur in regard to the transparency of the stone go back; in the Chinese records at my disposal I regret I can find nothing to this effect. In view of the mineralogical properties of turquois it is evident that this is a point of importance, for non-transparency is one of the prominent characteristics of turquois. As we can but presume that both Palladius and Couvreur must have founded their definition on some Chinese document, this would present another of the objections which must be raised to the weak hypothesis of identifying *sê-sê* with the turquois. E. H. PARKER (*China Review*, Vol. XVIII, 1890, p. 221) defines *sê-sê* as a sort of jade much used for arrowheads and other purposes by the Tibetans, Tungusians, and even Ta Yüe-chi (Indoscythians) who after their conversion to Buddhism had a sacred *pâtra* or alms-bowl made of the same material (*ts'ing shi*); in his opinion, *sê-sê* is identical with the latter term, which means green or blue (but possibly also dark-colored) stone. This point of view is hardly correct. The arrowheads of the Tungusian tribes, as corroborated by archæological finds made in the Amur region, were of nothing but common flint. The *ts'ing shi* of which the alms-bowl of the Indoscythians was made in all probability was lapis lazuli and would accordingly mean in this case 'blue stone'; on Buddhist pictures alms-bowls are usually painted an ultramarine or lapis-lazuli blue color (see above p. 14). There are several other instances where the word *ts'ing shi* has the same meaning (HIRTH, *China and the Roman Orient*, p. 72, and *Chinesische Studien*, p. 250). There is no Chinese text saying that *sê-sê* was a kind of jade, that it was a *ts'ing shi*, or ever used for arrowheads.

“The officers in full costume wear as ornaments — those of the highest rank *sê-sê*, the next gold, then gilded silver, then silver, and the lowest copper — which hang in large and small strings from the shoulder, and distinguish the rank of the wearer.”¹

BUSHELL comments that *sê-sê* is a kind of precious stone found in the high mountains north-east of Tashkend. At the outset, it does not seem very likely that in the latter passage the word has the significance of turquoise, for it outranks gold (compare above p. 11) and however much appreciated in Tibet, a turquoise could never outshine gold nor have any value equivalent to it, as was and is the case everywhere else; and as shown above, it was not even looked upon as a precious stone by the ancient Tibetans. There was still less reason for the Tibetans to import their turquoises from Tashkend — if *sê-sê* should denote especially the turquoises of that locality — as they found them in great abundance in their own country. Nor was the turquoise apt to serve for the distinction of the first official rank in Tibet, as it has always been there part and parcel of the adornment of all classes of people and particularly the ornament of women who are loaded with it. The *sê-sê* of the Tibetan officials must, therefore, have been something else, a much scarcer and more valuable gem. An idea of its value is afforded by a notice in the Annals of the Five Dynasties (*Sin Wu tai shi*, Ch. 74, p. 4 b) where it is said that the women of the T'u-po (Tibetans) wear beads of *sê-sê* in the plaited tresses of their hair, and that, as regards the best quality of these beads, a single one is bartered for, or has the exchange value of, a noble horse.² This seems to me to be sufficient evidence militant against the identification of *sê-sê* with the turquoise, as far as Tibet is concerned, for a single turquoise, whose value in Tibet may range from a few cents up to a dollar or so, could never have had nor has a valuation equivalent to a good horse.³

¹ See S. W. BUSHELL, The Early History of Tibet, p. 8 (*Journal Royal Asiatic Society*, 1880). The *T'ang shu* (K'ien-lung edition, Ch. 216 A, p. 1 b) has instead of *sê-sê* the reading *k'in-sê*, a frequent compound meaning “lute and harp” (Giles's Dictionary, No. 2109). It is evident that this way of writing is erroneous, and was perhaps suggested to a copyist who did not understand the unusual word *sê-sê*. The passage is not contained in the Old History of the T'ang dynasty (*Kiu T'ang shu*), but only in the New History (*Sin T'ang shu*).

² This passage occurs in the report of the embassy of Kao Kiü-hui of 938 A. D. ABEL-RÉMUSAT (*Histoire de la ville de Khotan*, p. 77, Paris, 1820), who has translated this account, rendered the word *sê-sê* by “pearls.”

³ In the History of the Kingdom of Nan-chao (*Nan-chao ye shi*, published in 1550), a tribute of *sê-sê* is mentioned for the year 794 as being sent from Nan-chao, comprising the territory of the present province of Yün-nan, to the court of China (C. SAINSON, *Histoire particulière du Nan-Tchao*, p. 54, Paris, 1904). At first sight, the *sê-sê* in this instance might be regarded as turquoises. R. PUMPELLY, as will be noted below, has referred to Yün-nan as a locality producing a mineral similar to turquoise, though this report requires confirmation. There is further evidence in the Annals of the Yüan Dynasty (*Yüan shi*, Ch. 16, p. 10 b) that in 1290 turquoises (*pi tien-tse*)

In the Old History of the T'ang Dynasty (*Kiu T'ang shu*, Ch. 198, p. 11 b), a description of the country Fu-lin (Syria) is given, whose great wealth in precious stones is emphasized. In the palaces, it is said there, the pillars are made of *sê-sê*.¹ It is difficult to see, if *sê-sê* should have to be identified with the turquois, how pillars could be made of this material. The Chinese text does not say that the pillars were adorned or inlaid with this stone but produced from it.

A fourth passage in the *T'ang shu* (Ch. 221 A, p. 10 b) referring to *sê-sê* is contained in an account of Khotan (*Yü l'ien*). Emperor Tê-tsung (780-805) despatched an emissary, Chu Ju-yü by name, to Khotan on the search for jade, and he obtained there a hundred pounds (catties) of *sê-sê*.² This notice is of great interest in showing that the precious stones of this name were really imported into China, and that the mart for them was Khotan.

There are, however, still earlier references to the jewel *sê-sê*. It is for the first time mentioned in the *Pei shi* (Ch. 97, pp. 7 b, 12 a) and in the "Annals of the Sui Dynasty"³ (*Sui shu*, Ch. 83, containing a record of the foreign countries then known to the Chinese). Both histories

were gathered in the circuit of Hui-ch'uan in Yün-nan Province; my friend Prof. Paul Pelliot was good enough to draw my attention to this passage. Another passage alludes to a gift of a thousand turquoises sent from Hui-ch'uan in 1284 (*Kin, l'ing se wên hien l'ung k'ao*, Ch. 23, p. 7). But it seems likely from what will be stated farther on in regard to the first acquaintance of the Chinese with the turquois in the Mongol period that the turquois mines of Yün-nan were opened only shortly before this time. At any rate I am not inclined to transfer this account without reserve to the date 794, nor to believe in the identity of the different terms *sê-sê* and *pi tien-tse*. While I should merely admit the possibility of such an identification, another historical explanation of the case may be pointed out. In the eighth century, the T'ai or Shan, the stock of peoples forming the kingdom of Nan-chao, were in close political alliance with the Tibetans who had then reached the zenith of their power. It would therefore be justifiable to conclude that the *sê-sê* of Nan-chao were derived from Tibet and are to be identified with the ancient Tibetan *sê-sê*, which, as will be shown hereafter, may be the emerald. In the *T'ang shu* (Ch. 222 A, p. 2 a), the women of the Southern *Man*, the large stock of aboriginal tribes formerly spread over the whole of southern China, are said to fasten in their hair beads, shells, *sê-sê*, and amber. In this case it is rather tempting at first sight to interpret *sê-sê* as turquois, because this combination of turquois and amber, as pointed out before, occurs indeed among the Tibetan group of tribes. But the *Man* do not belong to the Tibetan family, and another difficulty is presented by the fact that there are no records either of ancient or modern times pointing to the employment of the turquois among any tribe of the *Man*, so that it is safer to assume that the turquois is not understood in the above text.

¹ HIRTH, China and the Roman Orient, p. 53. At that time (1885) Hirth had not advanced any identification of this term.

² He embezzled the jade objects destined for the emperor, was sentenced, and died in exile (CHAVANNES, Documents, p. 128, note 2).

³ The *Pei shi*, "Northern Annals," was written by Li Yen-shou (GILES, Biographical Dictionary, p. 474) and completed about the year 644; it comprises the history of the dynasties of the north ruling from 386 to 618. The Sui dynasty ruled from 589 to 618. The *Sui shu* was composed by Wei Chêng (581-643; GILES, *l. c.*, p. 856) under the T'ang dynasty and completed in 636.

mention the jewel in two passages,— first, as a product of the country of Sogdiana (*K'ang*) corresponding to the region of Samarkand, and secondly as a product of Persia (*Po-se*, from *Pārs*).¹ The text of the *Pei shi*, with the same indications, is found also in the “Annals of the Wei Dynasty” (*Wei shu*, Ch. 102, pp. 5a and 9b).² But this passage

¹ It is noticeable that *sê-sê* as products of Persia are mentioned in *Pei shi* and *Sui shu*, but not in the two *T'ang shu*. The *Kiu T'ang shu* (Ch. 198, p. 11) enumerates as precious objects of Persia coral-trees, *ch'ê-k'ü*, agate, and “fire-pearls” (*huo chu*). The *T'ang shu* mentions only coral as a product of Persia and the gift to China of a couch of agate (CHAVANNES, Documents, pp. 171, 174). The exact history of the term *ch'ê-k'ü* which in general denotes a large white conch (Tibetan *dung*, Sanskrit *caṅkha*, Arabic *shenek*: M. REINAUD, Relation des voyages faits par les Arabes, Vol. I, p. 6), and sometimes seems to refer to a precious stone remains to be ascertained (compare HIRTH and ROCKHILL, Chau Ju-kua, p. 231; PELLIOU, *T'oung Pao*, 1912, p. 481). The “fire-pearls” were lenses of rock-crystal, alleged to have been used for producing fire (F. DE MÉLY, Les lapidaires chinois, p. 60; CHAVANNES, Documents, p. 166; PELLIOU, *Bulletin de l'École française d'Extrême-Orient*, Vol. III, 1903, p. 270; *Pên ts'ao kang mu*, Ch. 8, p. 18 a). In the *Sui shu*, *sê-sê* are enumerated together with genuine pearls, glass, amber, coral, lapis lazuli, agate, rock-crystal, *huo ts'i*, and diamond. The name *huo ts'i* (the alleged identity with *huo chu* remains to be proved) has not yet been properly identified. In the *Nan shi* (Ch. 78, p. 7) these stones are mentioned as products of central India and described as having the appearance of *yün-mu* and the color of violet gold (PELLIOU, *l. c.*); the difficulty is that also the word *yün-mu* which according to PELLIOU seems to designate mica and mother-o'-pearl is not yet determined beyond doubt. Possibly, *huo-ts'i* designates the garnet. The word *sê-sê* is, in the text of the *Sui shu*, followed by the words *hu lo kie lü t'êng*. At first I was inclined to take the verb *hu* in its literal sense “called, designated,” and to believe that the words following it represent a gloss, being the Persian or Arabic name of the stone in Chinese transcription. Reconstructing the ancient sounds of those Chinese characters we would arrive at the reading *lok* (or *rok*)-*ket-li-dang*; but there is no word in Persian or Arabic to be identified with such a form. M. PAUL PELLIOU, to whom I submitted this difficult point, has been good enough to write me that this passage had already attracted his attention, and that he does not regard the incriminated words as a gloss; he thinks that the word *hu* is also part of the transcription, and that two further products are enumerated in their Persian names. The passage, accordingly, should be understood in the sense that Persia produces *sê-sê*, *hu-lo(k)*, and *ket-li-dang*. The two latter names, however, are as yet unidentified, but with M. PELLIOU's very plausible point of view, a better attempt at identification might be pursued. Indeed, Prof. A. V. WILLIAMS JACKSON had called my attention to the fact that *kathidang* may be a compound of the word *qallān*, “link” or “scale,” used alike in Arabic, Turkish and Persian, and the Persian word *tan* “body,” the content of the term implying scale or chain armor. This is very suggestive, as indeed Persia was the country which supplied China with chain-mail (ancient specimens in the Field Museum). The *T'ang shu*, in the account on Samarkand (*K'ang*) states that in the beginning of the period *K'ai-yüan* (713-741) Samarkand sent as tribute to China chain-mail (*so-tse k'ai*). This question will be shortly discussed by me in another place. *Liang shu* (Ch. 54, p. 14 b) attributes to Persia coral-trees one to two feet high, amber, agate, genuine pearls, and *mei-hui*. HIRTH and ROCKHILL (Chau Ju-kua, p. 16, St. Petersburg, 1912), treating the products of Persia after *Wei shu* and *Sui shu*, entirely omit the *sê-sê* (and several others). It seems doubtful if, as stated so positively by the two authors, “most of these products came, of course, from India, or from countries of south-eastern Asia, only a few being products of Arabia, or countries bordering on the Persian Gulf” (and again on p. 7). This is true only to a certain extent; the *sê-sê*, at any rate, are not mentioned by the Chinese as products of India or south-eastern Asia, but exclusively as products of Persia and Sogdiana, to which, later in the T'ang period, Fu-lin, Tashkend, Tibet, and the *Man* are joined.

² The Wei dynasty ruled from 386 to 556; the *Wei shu* was written by Wei Shou (506-572; GILES, *l. c.*, p. 867) and presented to the throne in 554.

has no independent value, because Ch. 102 of this work treating of the countries of the west, as well demonstrated by CHAVANNES,¹ has been merely reproduced from Ch. 97 of the *Pei shi* by a committee of scholars of the Sung period headed by Fan Tsu-yü (1041-1098).

It is thus evident that *sê-sê* were known to the Chinese prior to the age of the T'ang dynasty as occurring in the territory of Persia and Sogdiana, to wit, within the Iranian culture-area. It is noteworthy also that any particular region or mountain producing the stone is not alluded to in these earlier texts as subsequently in the *T'ang shu*, and that *Pei shi* and *Sui shu*, while locating *sê-sê* in Sogdiana, do not allude to it in their notices of Tashkend (*Shi kuo*).

As I did not know on what evidence Prof. HIRTH had based his identification of *sê-sê* with the turquoise, I consulted him regarding this point, and he was good enough to furnish the following note which is here reproduced with his kind permission.

"The word *sô-sô* (in Cantonese *shat-shat*, *sit-sit*, or *sok-sok*) has, besides others, the meaning of a precious stone, 'a greenish or bluish bead' (*pi chu*), as quoted in *P'ei wên yün fu*, Ch. 93 B, p. 85. The *Pên ts'ao kang mu* (Ch. 8, p. 55) says that the people of the T'ang dynasty called green (or blue) precious stones by the name *sô-sô*. The Japanese sources as quoted in GEERTS, *Les Produits de la nature japonaise et chinoise*, p. 481, do not apparently refer to *sô-sô*, but the *T'u shu tsi ch'êng* (section 27, National Economy, Ch. 335) contains an extract from the *T'ien kung k'ai wu* in which *sô-sô* is classed with greenish precious stones. The *T'ang kuo shih p'u* (*ibid.*) relates the story of a big *sô-sô* which the author thinks was not a genuine one; the same story is told in *Yen fan lu*, Ch. 15, p. 11.

"BRETSCHNEIDER (*Chinese Recorder*, Vol. VI, p. 6) was, as far as I know, the first to find out that *sê-sê* was not a musical instrument as Pauthier had assumed, but a precious stone.² In his translation of a passage regarding precious stones found in the *Cho keng lu* (reproduced in his *Mediæval Researches*, Vol. I, pp. 173-6), he refers to 'stones called *tien-tze*' which occur in Nishapur and Kirman. Bretschneider says of these: 'I have little doubt that the Chinese author understood by it the turquoise, the Persian name of which is *firusê*. Both Nishapur and Kirman produced turquoise. So did the hills of Ferghana referred to in *Nachworte*, etc., p. 81, for the territory of Ferghana furnished turquoises, according to VON KREMER, *Kulturgeschichte des Orients*, Vol. I, p. 329. These are the reasons which had induced me to render *sô-sô* by 'Türkis'.³

¹ Documents, p. 99.

² The word *sê-sê* in the sense of a jewel, as will be seen below, is the Chinese transcription of a foreign word. The single word *sê* denotes a stringed musical instrument, a kind of lute, described e. g. by J. A. VAN AALST (*Chinese Music*, p. 62, Shanghai, 1884). But there is a passage (in the *San kuo chi*, *Wei chi*, commentary to the Biography of Ch'ên Se-wang, quoted in *P'ei wên yün fu*, Ch. 93 B, p. 85) where also the compound *sê-sê* seems to have the meaning of a musical instrument. In the *Tsin shu* (Ch. 97, p. 2) it is said in regard to the Shen Han, a Korean tribe, that they are skilled in playing the *sê-sê* which in shape is like a five-stringed lute (*chu*, No. 2575).

³ It should be added that it is Bretschneider himself (*Mediæval Researches*, Vol. I, p. 140) who first proposed the translation of *sê-sê* as turquoise, but with the restriction of a "probably."

It seems to me that the color designation insisted on by Hirth is hardly conclusive; the color name *pi*, 'bluish-green' (originally a kind of jade) is quite indistinct, and aside from the fact that there are many other green or blue stones like emerald, lapis lazuli, malachite, sapphire, etc.,¹ this attribute with reference to *sê-sê* does not appear in contemporaneous records of the Sui or T'ang periods, but only in later authors who were not personally familiar with the stone. It was known in China under that name only to a limited extent, during that time, and to the later generations the newly coined word simply became a poetical name with no other meaning than that of a rare, precious stone. The one fact stands out clearly, that *sê-sê* was looked upon as a precious stone, a fact for which more testimony will be given, and this is evidence that it can hardly be the turquoise. It is always essential to ascertain to what category an object in the views of the Chinese belongs; these categories are always fixed and stable, and suggest an inference as to the nature of the object in question. No Chinese has ever considered turquoise a precious stone, but just a common stone good enough for barbarous ornaments.² It is worth 5 Taels (about \$3.50) a catty (1½ pounds) in Si-ngan fu where it is sold by weight, and if the famous *sê-sê* were nothing more than that, the Chinese authors would not have expressed any enthusiasm about them.³ Hirth's quotation from Bret-

¹ That the definition *pi chu* means little is illustrated by the fact that other jewels are also defined by this term, as, for example, the pearl called *mu-nan* (HIRTH, China and the Roman Orient, p. 59) which is even described as yellow in other texts (*Ko chi king yüan*, Ch. 32, p. 7 b). Compare also *P'ei wên yüan fu*, Ch. 7 A, p. 101 b (*pi chu*). The color argument should therefore be disregarded.—The comparative tables of the colors given by W. TASSIN (Descriptive Catalogue of the Collections of Gems in the U. S. National Museum, *Report of National Museum*, 1900, pp. 541, 542) enumerate the green stones as follows: zircon, sapphire, garnet (demantoid and ouvarovite), chrysoberyl (alexandrite), spinel, topaz, diamond, olivine (peridot), tourmaline, beryl (emerald and aquamarine), quartz (chrysoprase, plasma, prase, and jasper), turquoise. The blue stones are: sapphire, spinel, topaz, diamond, tourmaline (indicolite), beryl (aquamarine), iolite (water sapphire, dichrolite). It should not be overlooked either that, as shown by the modern word *lü sung shi*, the color of turquoise is described by the Chinese with the word *lü*, not *pi*.

² A. J. C. GEERTS (Les produits de la nature japonaise et chinoise, p. 202, Yokohama, 1878) was cautious enough to pay due attention to the distinction made between *pierres ordinaires* and *pierres précieuses* in the *Pên ts'ao kang mu*.

³ In the *Lapidarium* of Pseudo-Aristotle (JULIUS RUSKA, Das Steinbuch des Aristoteles, p. 152, Heidelberg, 1912) it is said in regard to the turquoise: "Its color delights those afflicted with sorrow, but it is not employed for the costume of the kings, because it detracts from their majesty." A similar remark is made by Ibn al-Baitar: "It is soft and a bit fragile, and is not used for the ornaments of the sovereigns" (L. LECLERC, *Traité des simples*, l. c., p. 50). In an Arabic work of 1175 it is said: "Many kings hardly have the desire to wear a turquoise, because the vulgar frequently utilizes it as sigillum and wears finger rings which are imitations of its best kind" (WIEDEMANN, *Beiträge zur Geschichte der Naturwissenschaften*, XXX. Zur Mineralogie im Islam, p. 234, Erlangen, 1912). Also in Europe turquoises were low in price. "Admodum magno pretio non venditur, quia magna illarum ex Oriente adfertur copia," says A. BOETIUS DE BOOR (*Gemmarum et lapidum historia*, p. 271, ed. of A. TOLL, Lugduni Batavorum, 1636). The general rule may be set down that there is a large consensus of opinion as to the value of precious metals and

schneider is hardly in favor of his view that *sê-sê* was the turquoise; BRETSCHNEIDER's statement merely shows that at the end of the Mongol dynasty — the *Cho keng lu* was published in 1366 — the Persian turquoise became known to the Chinese.

From three practical examples it may be demonstrated that *sê-sê*, as known during the Sung period, cannot be construed to mean turquoise.

In the *K'ao ku t'u* (Ch. 10, p. 22 b), a book on ancient bronzes by Lü Ta-lin, completed in 1092, a girdle-clasp is figured and described as being made of *sê-sê*; it is a highly ornamented piece, engraved in fine lines and ending in a curve shaped into a dragon's head. This whole technique would be impossible if the material were turquoise, which results only in straight, stiff, angular lines (compare Plates VI-VIII).

The *Ku yü t'u p'u*, "Illustrated Description of Ancient Jades," compiled in 1176 and printed in 1779, describes several jade specimens adorned with the stone *sê-sê*, — a sword possessed by the Sung Emperor T'ai-tsu (968-976), having a hilt ornamented with amber, *sê-sê*, and genuine pearls (Ch. 28, p. 10). The Chinese would hardly display such bad taste as to unite a cheap stone like turquoise with genuine pearls. In Ch. 97, p. 10, of the same work a jade lantern of the Sung palace is figured and described, the eight sides of which are adorned with coral, amber, *sê-sê* and such like jewels (*pao*). In this case turquoise is again out of the question, as it is not considered by the Chinese a precious stone or a jewel, but just an ordinary stone.¹

The two works here quoted come down from the Sung period, and it can be shown from another source of the same epoch that the word *sê-sê* designated at that time a stone capable of carving found on the very soil of China, and that, consequently, the *sê-sê* in the age of the Sung dynasty are affairs different from those mentioned in the *Pei shi*, *Sui shu* and *T'ang shu* for Persia, Sogdiana, Ferghana, and Tibet. Kao Se-sun, a poet and essayist who lived in the latter part of the twelfth century,² is the author of an interesting work on miscellaneous minerals among peoples of all times, and that the changes which have affected the appreciation of precious stones from the days of antiquity until now are but very slight, chiefly due to the operations of fashion and variations in the sources of supply. Thus it is not very likely that a stone looked upon as non-precious at present by general agreement of opinion was ever prized as a jewel in earlier periods of history.

¹ Such carvings of *sê-sê* are referred to also by other authors of the Sung period. Chou Mi in his interesting work *Yün yen kuo yen lu* (Ch. B, p. 31 b), a review of ancient bronzes, paintings and jades which had come to the notice of the author during his lifetime, mentions the carving of "a crane moaning in the autumn" entirely made from this material. This very subject savors of the impressionism of the Sung artists, and in this case turquoise is inconceivable, not only for technical but also, and even more so, for artistic reasons. The work quoted is embodied in the collection *Shi wan kuan lou* edited by Lu Sin-yüan and thoroughly analyzed by PAUL PELLIER (*Bulletin de l'Ecole française d'Extrême-Orient*, Vol. IX, 1909, p. 246).

² GILES, *Biographical Dictionary*, p. 368; WYLIE, *Notes on Chinese Literature*, p. 161.

subjects, entitled *Wei-liao*.¹ In Ch. 5, p. 3, he has gathered several notes concerning *sê-sê*. He quotes the *Huan yü ki*² to the effect that *sê-sê* are mined in Shan-chou³ and P'ing-lu.⁴ Neither of these localities is known as having ever produced turquois. We shall see farther on that turquois became known and was mined in China only under the Yüan dynasty following the Sung, so that we may justly conclude that the Chinese of the Sung period were not yet acquainted with it. Besides, there is the technical evidence that turquois, according to its natural properties, could not have entered such objects as are reported to have been made of *sê-sê*. The *Wei liao* furnishes us with additional evidence on this point, which goes to show that, if these reports are trustworthy, a substance *sê-sê* of Chinese production was utilized as early as the T'ang period. It is related in regard to an official of that time, who presided over the bureau of the salt and iron monopoly in the province of Fu-kien, that he owned a pillow made of *sê-sê* placed on a golden bedstead.⁵ Emperor Hien-tsung (806-820) tried to estimate its value, but arrived at the conclusion that it was a priceless treasure, while others said that this pillow was made from a beautiful stone, but not from *sê-sê*. The author of the *Wei liao* adds: "What is circulating among our contemporaries under the name *sê-sê*, I believe is made from molten stone."⁶ So it seems that at the Sung period the *sê-sê* may have been, at least partially, artificial productions. It is self-evident that the pillow referred to cannot have been made of turquois. The rectangular shapes of Chinese pillows with convex surface are well known, and it is impossible to carve turquois which is quarried in long slabs⁷ into such a form.

¹ Reprinted in *Shou shan ko ts'ung shu*, Vol. 74.

² A general, mainly geographical, description of China published by Yo Shi during the period *T'ai-p'ing hing-kuo* (976-981) of the Sung dynasty.

³ In the province of Ho-nan (PLAYFAIR, *Cities and Towns of China*, No. 6157).

⁴ District in Shan-si Province (PLAYFAIR, No. 5812).

⁵ The *Wei liao* quotes this story from the *Yen fan lu* of Ch'êng Ta-ch'ang, written in 1175. The *P'ei wên yün fu* (*J. c.*) gives it after the biography of Lu Kien-tz'e in the *T'ang shu*, so that there is no doubt that it relates to the period of the T'ang dynasty.

⁶ There are different versions of this story handed down, the details of which are not of interest in this connection. According to the *T'ang kuo shi p'u*, containing records from 723 to 821 by Li Chao of the T'ang period (as quoted in the *T'u shu ts'i ch'êng*), the said official was discharged on account of defraudations; the pillow which was half the size of a peck was confiscated after a judicial trial and sent up to Emperor Hien-tsung who called some shop-keepers as experts to determine its value. Their opinions were divided, the one calling it a priceless treasure, the others a beautiful stone, but not a genuine *sê-sê*.

⁷ Several such specimens showing turquois in the matrix, obtained in Si-ngan fu, are in the Field Museum.

The *Wei lio*, further, refers to two stories taken from the *Ming-huang tsa lu*.¹

Emperor Ming-huang is said to have erected in the palace Hua-ts'ing a bathing establishment consisting of ten rooms where he had a boat built of silver and steel, varnished, and adorned with pearls and jade; moreover, he piled up *sê-sê* in the bathing pool. The author of the *Wei lio* thinks that the use of the word *lei* (No. 6833) "to pile up" in this connection indicates that the *sê-sê* in question were beads, and not stones. But this supposition is hardly correct, for it leaves entirely unexplained what these beads (or pearls) had to do in the bath. In the actual text of the *Ming-huang tsa lu*² the story, however, is related in the form that the *sê-sê* were utilized to build up the well-known Three Isles of the Blessed of mythological fame, and this account sounds more plausible. In this case, *sê-sê* seems to have been a kind of building stone.³ The other story in the *Ming-huang tsa lu* relates to Dame Kuo-kuo, a sister of the celebrated beauty and imperial concubine Yang Kuei-fei,⁴ who built a house and rewarded the workmen with two gold cups and three pecks of *sê-sê*; one peck of these, according to the opinion expressed by the author of the *Wei lio*, had the value of a pearl. He further tells after the *Wu lei siang kan chi*, a work of the poet Su Shi (1036-1101), that Emperor I-tsung (860-873) of the T'ang dynasty presented a princess with a screen of *sê-sê* adorned with genuine pearls strung on blue and green silk, whence our author Kao Se-sun infers that in this case *sê-sê* was a kind of pearls of brilliant quality. This discourse leads us to think that the Sung writers did not know any longer what the *sê-sê* of the T'ang dynasty were, that the *sê-sê* peculiar to that age were entirely lost in the Sung period, that substitutes were then in vogue, merely designated by that name and ascribed to two localities, Shan-chou and P'ing-lu, and that even the belief prevailed that the *sê-sê* passed off under this name at that time were artificial productions due to some smelting process.⁵

¹ That is, Miscellaneous Records regarding Emperor Ming-huang (712-754), a work by Chêng Ch'u-hui of the T'ang period.

² Printed in the collection *Shou shan ko ts'ung shu*, Vol. 84, Ch. B, p. 4.

³ This seems to be the case also in a poem of Po Kū-i (772-846) when he speaks of "a piece (or slab) of *sê-sê* stone" (*i p'ien sê-sê shi*; *P'ei wên yün fu*, Ch. 100 A, p. 47). Neither the addition "stone" nor the word *p'ien* would be used here, if the domestic *sê-sê* had been a precious stone or gem.

⁴ GILES, Biographical Dictionary, p. 908.

⁵ Under the Yüan dynasty the *sê-sê* are mentioned by Ch'ang Tê, a Chinese envoy who visited Bagdad in 1259, as precious stones in the palace of the Caliph, together with pearls, lapis lazuli and diamonds (BRETSCHNEIDER, *Chinese Recorder*, Vol. V, p. 5). Bretschneider does not make in this passage an attempt at identifying the stone. When he says that, according to K'ang-hi's Dictionary, it is a kind of pearl, it should be remembered that the Chinese word *chu* means only a bead, regard-

If as early as the Sung period the Chinese had lost all correct notions of the *sê-sê* of the Leu-ch'ao and T'ang periods, there is no reason to wonder that the confusion becomes complete among the later authors who are simply content to repeat the older statements. Characteristic of this state of affairs is the explanation given in the *T'ung ya*, a miscellany written by Fang Mi-chi at the close of the Ming period: "The *sê-sê* are looked upon by some as precious stones, while the *Wei liô* considers them as pearls. Ch'êng T'ai-chi says: The *sê-sê* circulating at our time are all made from burnt stone. There are, however, three kinds of *sê-sê*:— precious stones like pearls are the genuine ones; those passing into blue and changing their color are the burnt ones, which are round and bright; Chinese beads of colored glass and baked clay are also called *sê-sê* by a mere transfer of the name."¹ There is assuredly not one Chinese author to venture the identification of *sê-sê* with turquois; neither under the Yüan nor under the Manchu dynasty when turquois was perfectly known in China did anybody assert that it was identical with the *sê-sê* in vogue during the T'ang dynasty.²

less of the material, whereas a pearl is always *chên chu*, a true or genuine pearl. In his *Medieval Researches* (Vol. I, p. 140), he says, however, that *sê-sê* is probably the turquois. In the *Annals of the Yüan Dynasty* (*Yüan shi*, Ch. 21, p. 7 b, reign of Emperor Ch'êng-tsung, 1295-1307) there is another reference to *sê-sê*, two thousand five hundred catties of which are reported to have been palmed off on officials in lieu of money; but this transaction was soon stopped by the emperor. The turquois cannot be understood in this case, because, as will be seen below, this stone was known in the Mongol period under the name *pi tien* and is always so designated in the *Yüan shi*. Another text allows the inference that what was known as *sê-sê* in the Yüan epoch was a stone coming from Manchuria. The *Chêng tse t'ung* written in the beginning of the seventeenth century is quoted in K'ang-hi's Dictionary as saying that at the time of Emperor Jên-tsung (1312-20) of the Yüan dynasty it was reported that the subprefecture Kin-chou (in Fêng-t'ien fu, Shêng-king, Manchuria) offered *sê-sê* which had been gathered in a cave. The passage occurs in the *Yüan shi*, Ch. 24, p. 2 b; the Emperor was requested to send an envoy to the place who should gather the stones, but declined, as he regarded them as useless. Consequently the *sê-sê* of the Mongol period, as far as they relate to Chinese territory, cannot have been turquoises, as it was the very turquois which was highly appreciated by the Mongol rulers.

¹ Also Fang I-chi who lived in the first part of the seventeenth century, in his work *Wu li siao shi* (Ch. 8, p. 23 b; edition of Ning tsing t'ang, 1884) states that colored glass beads are designated *sê-sê*. This is the most recent author in whom I have been able to trace this word.

² BRETSCHNEIDER (*Medieval Researches*, Vol. I, p. 175) is entirely erroneous in his assertion that it is stated in the *Pên ts'ao kang mu* that the stone called *tien-tse* was known under the name of *sê-sê* at the time of the T'ang dynasty. The *Pên ts'ao* does not contain a word to this effect. Its author, Li Shi-chên, states in the beginning of his essay on precious stones that blue ones are called *tien-tse* (No. 11,199); this is not the word *tien-tse* (No. 11,180) used in the *Cho keng lu* and *Yüan shi* (see below). Then follow ten sentences which have nothing at all to do with this subject, whereupon he proceeds to say, as stated above, that blue-green ones were called *sê-sê* by the T'ang people. It is therefore evident that these two statements separated from each other by several lines are not mutually connected, and that, on the contrary, in the mind of Li Shi-chên *tien-tse* and *sê-sê* are entirely distinct affairs; neither in the case of *tien-tse* does he refer to *sê-sê*, nor in the case of *sê-sê* to *tien-tse*; and he says nowhere that the one is identical with the other. Even did he say so, his

Li Shi-chên, the author of the great work on natural history, *Pên ts'ao kang mu*, makes one brief allusion to it (Section on Mineralogy, *kin shi*, Ch. 8, p. 17 b) in the chapter on Precious Stones (*pao shi*). Enumerating the different kinds of jewels mentioned in earlier texts, he says: "As regards the blue-green (*pi*) ones, the people of the T'ang dynasty called them *sê-sê*; as regards the red ones, the Sung people called them *mo-ho*; nowadays the general term is simply precious stones which are used for inlaying head-ornaments and utensils." This passage shows that Li Shi-chên considers the *sê-sê* as a gem peculiar to the T'ang period, and that he regards it as a precious stone, not as an ordinary stone.¹ The lack of any description on his part bears out the fact that he did not know the stone from personal acquaintance, and that he merely speaks of it on the ground of meagre traditions.

It is thus manifest that at various periods and with reference to different localities the Chinese have linked different ideas with the word *sê-sê*, that the later accounts are of no value in its determination as regards the earlier periods of the Leu-ch'ao and T'ang, and that even for the T'ang epoch a clear distinction must be made between the *sê-sê* of the countries outside of China and those within the Chinese dominion.

The various texts of the *Pei shi*, *Sui shu* and *T'ang shu* relating to foreign countries go to prove that the *sê-sê* of those times were valuable jewels, and that for this reason the word can hardly denote the turquoise. It is not known to me on what authority VON KREMER's statement of turquoise mines in Ferghana rests (his book is unfortunately not accessible to me), but I should think that he could not be regarded as an

assertion would be valueless, as he simply reproduces literary reminiscences, but does not show any actual knowledge of the stones of which he is speaking. We might well make bold to say that Li Shi-chên (as most of his countrymen during the Ming period) had never seen a turquoise. In the official Statutes of the Ming Dynasty (*Ta Ming hui tien*) jade, agate, coral, amber, pearls, and ivory are frequently mentioned in connection with state paraphernalia and court costume, but turquoise is conspicuous by its absence.

¹ Also in the great cyclopædia *T'u shu tsi ch'êng*, *sê-sê* are classified among precious stones (*pao shi*), likewise in the *T'ien kung k'ai wu*, a work on technology by Sung Ying-sing, of 1637 (Ch. 18, p. 58 b). Prof. HIRTH, in his above note, alludes to this book after an extract in the *T'u shu tsi ch'êng*. As an edition of this very scarce and valuable work printed 1771 in Japan is in my possession (despite diligent search I could not find any in China), I may say that it contains nothing to elucidate the subject; it simply says that of green stones there are *sê-sê* beads, emeralds (*tsie-mu-lü*), rubies (*ya-ku*) and the various kinds of *k'ung ts'ing* (on the latter see F. DE MÉLY, *Les lapidaires chinois*, p. 112, Paris, 1896). The author, accordingly, repeats bookish reminiscences but had no actual knowledge of, or experience with these stones which are to him mere names. It is certainly essential to determine in investigations of this kind, whether a Chinese author speaks of an object from direct knowledge of it, or merely reproduces the statements of his predecessors. In other words, we must adopt sound and critical philological methods before venturing any conclusions. It is manifest that the statements of the Ming and Ts'ing authors concerning *sê-sê* are of a purely bookish character and weak echoes of the past, but have no value whatever for the study of the question as to what the *sê-sê* of the past really were.

authority on mineralogical matters; presumably he refers to the Arabic authors alluded to by MAX BAUER (see below). I do not doubt that, as stated by Hirth, turquoise is found in modern times in the region of Ferghana, although the evidence which I am able to find is rather slight.¹ On the other hand it is asserted by BAUER also that turquoise occurs *in situ* in the region of Samarkand.² BAUER does not state his source, and I have no means of tracing it; the "unknown time" when the turquoise mines were operated there is a rather unsatisfactory feature, and it would certainly remain to be proved that turquoise was quarried in that region as early as the T'ang period (618-906). But granting the benefit of the doubt to those arguing on the opposite side, the possibility should be admitted that in the one passage of the *T'ang shu* indicated by Hirth and Chavannes the word *sê-sê* could denote the

¹ The opinion that turquoise occurs in Ferghana is largely based on a remark of H. LANSDALL (Russian Central Asia, p. 515, London, 1885) who says that turquoise is found at Mount Karumagar, 24 miles N. E. of Khojend; but Lansdall was an amateur traveler of journalistic tendencies in whose observations little confidence can be placed. The Armenian *lapidarium* translated into Russian by K. P. PATKANOV (Precious Stones, their Names and Properties according to the Notions of the Armenians, p. 48, St. Petersburg, 1873) mentions Khojend as a source for turquoise. On the other hand it should not be passed over with silence that one of the best explorers of Ferghana who has given a detailed description of the region, CH. E. DE UJFALVY (Le Kohistan, le Ferghanah et Kouldja, p. 51, Paris, 1878) remarks on its mineral resources as follows: "In the mountains of Ferghana are found iron, lead, charcoal, quartz, kali, amethyst crystals, rock-crystal, silver, mica schist, sulphur, etc. (a cave near Aravān has stalactites and stalagmites). In the district of Andijān there are rich sources of naphtha of excellent quality, and also sulphurous sources at 38° Celsius." He does not mention turquoise. Turquoises are still utilized by the Sart in and around Tashkend for the decoration of silver necklaces, bridles, girdle-clasps, etc. (see, for example, H. MOSER, A travers l'Asie centrale, pp. 104-7, Paris, 1885). My colleague Dr. KARUTZ at the Museum of Lübeck, who has traveled extensively in Russian Turkistan, writes me that he encountered two areas in which turquoise is diffused, among the Tatars of Russia and among the Sart of Turkistan, but that he did not find it among the Turkmen and the Kirghiz; he therefore concludes that it occurs only in the town population, but not among the nomads of the steppe; he learned nothing about indigenous sources of the stone, but is convinced that it is imported from Afghanistan. There is, he says, a rumor to the effect that turquoise is found in the Kirghiz steppe, but he doubts the fact, as it is not employed by the Kirghiz in their ornaments.

² MAX BAUER (Precious Stones, p. 396) has the following note on turquoise in this region: "It is stated that there are turquoise mines, yielding mostly green stones, further to the north-west, beyond the Persian frontier between Herat and western Turkistan. According to the statements of ancient [?] Arabic writers, the precious stone was found at Khojend, from whence came also the green *callais* (*callaina*) of Pliny, now considered to be identical with turquoise [this is extremely doubtful: note of the writer. On p. 392 BAUER says: "Whether the ancients were acquainted with turquoise is doubtful."]. Other localities in the same region have also been recorded; for example, in 1887 in the mountain range Kara-Tube, fifty kilometres from Samarkand. The turquoise occurs here in limonite and quartzose slate, and the place was, at some unknown time, the scene of mining operations. Finds of turquoise have been made in the same region in our own time; for example, in the Syr Darya country in the Kuraminsk district (in the Kara Mazar mountains), and also in the Karkaralinsk district in the Kirghiz Steppes (Semipalatinsk territory of Siberia). These and other occurrences in the same region have no commercial importance and need no further consideration."

turquois, if the mineralogical condition of the present time, provided the fact is correct, will be admitted as evidence.¹ It cannot, however, be admitted as already demonstrated, that in other early passages the turquois is disguised under the word *sê-sê*; there is no forcible argument in favor of such a guess (supposition it can hardly be called); on the contrary, the valuation and utilization of the stone speak strongly against it.

Another moot question is the historical position of the turquois in those regions which are covered by the word *sê-sê*; there is no great antiquity and, accordingly, no archæology of the turquois in western Asia. It does not appear in Assyria, Babylonia or ancient Persia; it hardly plays any rôle in Greek and Roman antiquity.² Egypt³ is the only country in the Old World which may lay claim to a great antiquity in the utilization of the turquois mined in the Sinai Mountains, and some objects inlaid with turquois mosaic and assigned to the Siberian bronze period, though neither their locality nor their time is exactly ascertained, may be of considerable age (see p. 58). So far as I know, no really

¹ Personally I am not convinced. It will be seen below that the first actual knowledge of the turquois dawns upon the Chinese as late as the Mongol period when a newly coined word for it appears, and when the word *sê-sê* continues with quite a different meaning. It is inconceivable to me that the knowledge of an object, when it is once acquired (and particularly of an object so striking to the eye as a turquois), can ever become lost. The tradition of the Mongol period is entirely cut off from that of the T'ang, the two not being interrelated. If the *sê-sê* of Ferghana were the turquois, why are the *sê-sê* objects occurring in China in the T'ang period not so described that a plain conclusion as to this material can be drawn? But they were evidently made of some building-stone. For this reason the question may be justly raised whether the account of the T'ang *shu* in regard to the mountain near Tashkent where *sê-sê* is produced really possesses great importance; it is somewhat vague, the name of the mountain not even being given; the report is evidently reproduced from hearsay. The earlier accounts of the *Pei shi* and *Sui shu*, which ascribe these jewels to an adjacent region without making reference to a definite locality, seem to me to be more to the point. All that can be safely laid down therefore is that *sê-sê* occurred in the territory of Ferghana and Sogdiana during the time from the fifth to the seventh century. In view of the other texts quoted above which must be equally taken into account in a consideration of this question, there is no reason to place all emphasis on this one statement; *sê-sê* occurred in Persia and Syria, and were traded in Khotan. Thus, they held the territory of western Asia and the dominion of the Western Turks. And as will be seen farther on, they were brought over to China by Manicheans or Nestorians.

² H. BLÜMNER, *Technologie und Terminologie der Gewerbe und Künste bei Griechen und Römern*, Vol. III, p. 248 (Leipzig, 1884). It is still more doubtful to me than to Blümner if the *callaina* or *callais* of Pliny, as has been supposed, refers to the turquois; the evidence favoring this theory is extremely weak; Pliny's statement that the stone is produced in Farther India or beyond India and in the Caucasus (*nascitur post aversa Indiæ, apud incolas Caucasi*) where we positively know that no turquois is found proves that he does not speak of the turquois. Compare p. 2, note 2. "Turquois, hardly ever used by the Greeks, was rarely employed by Græco-Roman artists" (D. OSBORNE, *Engraved Gems*, p. 284, New York, 1912).

³ The ancient Egyptian turquois-mines in Wadi Maghara and Wadi Sidreh in the Sinaitic Peninsula were first discovered in 1849 by Major C. Macdonald, then visited by H. BRUGSCH (*Wanderung nach den Türkisminen und der Sinai-Halbinsel*, Leipzig, 1866), and examined anew in 1905 by W. M. Flinders Petrie.

ancient carved object of turquois has as yet come to light in Persia or Turkistan,¹ while a great variety of gems appears in the Persian intaglios, particularly in those of the Sassanian epoch (226–642 A. D.) among which turquois is strikingly absent.² It is no less because of this lack of archaeological evidence that I hesitate to believe in the proposed identification of *sê-sê* with turquois, as regards the older accounts of the *Pei shi* and *Sui shu*.

Furthermore, the important question arises,— what is the antiquity of the turquois in Persia? When were the turquois mines of Persia first operated, at what time did turquois begin to play an active rôle in the culture and life of the Persian people? It is evident that all this is a matter of consequence for our *sê-sê* problem. I am certainly not competent to decide this question, the final solution of which must come to us from one of our co-workers in the Arabic or Persian field; but even to an outsider who has merely a scant knowledge of this subject some observations spontaneously present themselves which render him very cautious or rather skeptic in assuming, as has so often been done without any substantial evidence, a considerable antiquity for the acquaintance of the Persians with the turquois. There is, first of all, no ancient Iranian word for the turquois. Avestan literature, as far as I know, makes no allusion to it. A great authority, W. GEIGER,³ emphasizes the fact that the minerals characteristic of Irân, as turquois, ruby, lapis lazuli, are not even mentioned in the Avesta. The lack of an Iranian word for it, with the additional absence of an ancient Sanskrit word, renders the supposition highly probable that neither the Aryans nor the Iranians had any knowledge of turquois. The word *ferozah* is New Persian, consequently not older than the ninth century; in Middle Persian or Pahlavî, the language of the Arsacids and Sassanians, no word for the turquois seems to be preserved, unless it is represented by

¹ In a collection of ancient intaglios found in the environment of Khotan and described by A. F. R. HOERNLE (A Report on the British Collection of Antiquities from Central Asia, pt. I, p. 38, Calcutta, 1899) objects of spinel and lapis lazuli occur, but none of turquois. F. GRECARD (Mission scientifique dans la Haute Asie, Vol. III, p. 143, Paris, 1898) found in a cave near Khotan a wooden image with eyes formed by rubies. In the famous treasure discovered in 1877 on the northern bank of the Oxus described by A. CUNNINGHAM (Relics from Ancient Persia, *Journal Asiatic Society of Bengal*, 1881, pp. 151–186) and O. M. DALTON (The Treasure of the Oxus, London, 1905), despite a great number of ornaments, no turquois has been traced. Also in the works on Persian art (M. DIEULAFOY, *L'art antique de la Perse*; PERROT and CHAPIEZ, *History of Art in Persia*, London, 1892) no reference is made to turquois.

² Compare the Sassanian precious stones as enumerated, for instance, in ED. BAUMANN, *Allgemeine Geschichte der bildenden Künste*, Vol. I, pt. 2, p. 538, G. STEINDORFF's *Description of Sassanian Gems in Mitteilungen aus den Orientalischen Sammlungen des Berliner Museums*, No. 4, and J. MENANT, *Cachets orientaux, Intailles sassanides (Cat. Coll. de Clercq*, Vol. II, pt. 1, Paris, 1890). In none of these publications is turquois pointed out.

³ *Ostiranische Kultur im Altertum*, p. 147 (Erlangen, 1887).

the older form *fīrūzag* handed down by the *lapidarium* of Pseudo-Aristotle¹ and al-Bērūnī. In questioning the archæologists, we meet a slight piece of evidence. In the kurgans of Anau² beads of turquois together with those of carnelian and lapis lazuli have been discovered, and as it is asserted, "in the earliest culture strata." They were used as burial gifts with the skeleton of a child, and it is concluded in the publication referred to that they must have come from Persia where turquois is known both to the south of Anau and farther eastward on the plateau. But the chronology of these antiquities of Anau is somewhat uncertain, and by no means seems to me to be settled beyond doubt; aside from this, the deduction that the Anau turquoises, granted that they are what they are presented to be, *must* be of Persian origin is not at all forceful, and not proved. They *may* have come as well from Siberia where turquois was employed during the bronze age (p. 58), though the locality where the ancient Siberian turquois was mined is not yet known, or (why not?) from Tibet, or from some forgotten mine in Turkistan. Reverting to Persia and glancing over the pages of the history of the Sassanians (226-642 A. D.)³ we look in vain for any testimony that turquois formed an essential constituent of the culture of the period. The only item I am able to trace is a statement made by A. CHRISTENSEN⁴ to the effect that King Khosrau II (590 A. D.) possessed a game of backgammon (*nard*), the men of which were carved from coral and turquoises. With respect to these turquois carvings some doubts may be entertained, particularly for the reason that the Persian mineralogist Muhammed Ibn Mansūr who wrote about 1300 in the translation of Gen. SCHINDLER⁵ says that in the environment of

¹ J. RUSKA, *Das Steinbuch des Aristoteles*, p. 43 (Heidelberg, 1912).

² R. PUMPELLY, *Explorations in Turkestan*, Vol. I, pp. 60, 64, 199 (Washington, 1908).

³ TH. NÖLDEKE, *Geschichte der Perser und Araber zur Zeit der Sasaniden* (Leiden, 1879); NÖLDEKE, *Aufsätze zur persischen Geschichte* (Leipzig, 1887); M. K. PATKANIAN, *Essai d'une histoire de la dynastie des Sassanides* (*Journal asiatique*, 1866, pp. 101-238); J. MARQUART, *Untersuchungen zur Geschichte von Eran* (Göttingen und Leipzig, 1896, 1905); K. A. INOSTRANTSEV, *Sassanian Studies* (in Russian, St. Petersburg, 1909). There is certainly no doubt that the ancient Persian kings and subsequently the Sassanians possessed quantities of precious stones in their treasuries and graves, but all indications are lacking as to what they were. ARRIAN (*Anabasis* VI, 29) mentions gold earrings set with precious stones as part of the treasures hoarded in the tomb of Cyrus at Pasargadae. Compare further M. DIEULAFOY, *L'art antique de la Perse*, Vol. V, p. 137, and O. M. DALTON, *The Treasure of the Oxus*, p. 9.

⁴ *L'empire des Sassanides, le peuple, l'état, la cour*, p. 105 (Copenhagen, 1907). The source for this statement is H. ZOTENBERG, *Histoire des rois des Perses*, p. 700 (Paris, 1900); but the Arabic work (edited and translated by Zotenberg) written by al-Ta'ālībī (961-1038) can hardly claim any historical authenticity; it is purely legendary in character and a counterpart to Firdausi's *Shāh-nāmah*.

⁵ *Jahrbuch der k. k. Geologischen Reichsanstalt*, Vol. XXXVI, Wien, 1886, p. 310.

Nīshāpūr is found a stone *similar* to turquoise from which chess-men are made, but that its color soon disappears. Thus, also the backgammon men of Khosrau, if at all the report may lay claim to historical authenticity, which is doubtful, may have been worked from this stone material which merely had an outward resemblance to turquoise.¹ We move on safer ground in coming down to the Arabic authors of the middle ages; they indeed are the first to bring to our notice the mining of turquoise in Nīshāpūr.² Al-Kindī, who lived in the latter part of the ninth century, as quoted by Ibn al-Baiṭār,³ briefly mentions the turquoise without alluding to Persia, nor does the oldest source for Arabic mineralogy, the *lapidarium*, wrongly connected with the name of Aristotle,⁴ which according to RUSKA was composed before the middle of the ninth century. The fact that Persia is not alluded to by these two authors is not decisive; on the contrary, it is highly probable that they had the Persian turquoise in their minds, for they designate it by the older Persian form *fīrūzag*, and as pointed out by RUSKA,⁵ it is noticeable that in the text translated by him Persia, Khorāsān, India and China are most frequently cited among the localities for the minerals described in it.

The earliest allusion to the turquoise-mines of Nīshāpūr which I am able to find is made by Ibn Haukal (978 A. D.), who based his account on Iṣṭakhri (951). He reports as follows:⁶

"The villages and the towns in the plain around Nīshāpūr are numerous and well populated. In the mountains of Nīshāpūr and Tus are mines, in which are found brass, iron, turquoises, santalum, and the precious stone called malachite; they are said to contain also gold and beryl."

Al-Bērūnī (973-1048) seems to be the second weighty authority with a distinct reference to Nīshāpūr by stating that the turquoise is brought from the mountain Ansār, one of the mountains of Rīwand near

¹ J. DE MORGAN (*Mission scientifique en Perse*, Vol. IV, p. 320, Paris, 1897) figures a bas-relief of Takht-i Bostān representing Khosrau II Parwēz (591-628) in full armor on horseback and interprets the medial row of stones inlaid in the sheath of the sword as turquoises. There is no color displayed on this stone bas-relief, and this view seems wholly arbitrary; it is rejected as fantastic by F. SARRE and S. HERZFELD, *Iranische Felsreliefs*, p. 203 (Berlin, 1910).

² Name of a city and province in northern Khorāsān. The city was founded by Shāpūr II (309-379) whose name forms the second element in the name of the city. The Old Persian name is Nēw-Shāpūr, the word *nēw* meaning good. The New Persian form is *Nēshāpūr*, at present *Nīshāpūr*, Arabic *Naisābūr* (compare NÖLDEKE, *Geschichte der Perser und Araber zur Zeit der Sasaniden*, pp. 59, 67; an interesting sketch of the history of the city is given by A. V. W. JACKSON, *From Constantinople to the Home of Omar Khayyam*, pp. 246-260, New York, 1911).

³ L. LECLERC, *l. c.*, Vol. III, p. 51.

⁴ J. RUSKA, *Das Steinbuch des Aristoteles*, p. 151.

⁵ *L. c.*, p. 43.

⁶ A. V. W. JACKSON, *l. c.*, p. 254.

that city.¹ His contemporary al-Ta'ālībī (961-1038) expands likewise on the turquois of Nishāpūr.² Then we have the testimony of Tifāshī whose work on precious stones was written toward the middle of the thirteenth century (the author died in 1253) who says anent the turquois that it originates from a mine situated in a mountain of Nishāpūr whence it is exported into all countries.³ This seems to be the first clear statement of the fact that the Persian turquois of Nishāpūr had entered into the commerce of the world. Can it be mere chance now that we find the first record of the turquois of this place in China in 1366 (p. 56), and that the Persian turquois makes its début in India only during the Mohammedan epoch? Finally we come to the Persian mineralogy of Muhammed Ibn Mansūr above referred to which according to SCHINDLER was written about 1300, according to RUSKA⁴ in the thirteenth century; still later is al-Akfānī who died in 1347-48, and who in his treatise on precious stones deals also with the turquois.⁵

There is also the evidence furnished by MARCO POLO⁶ who passed

¹ E. WIEDEMANN, *Der Islam*, Vol. II, 1911, p. 352.

² WIEDEMANN, *Zur Mineralogie im Islam*, p. 242 (Erlangen, 1912).

³ L. LECLERQ, *l. c.*

⁴ *L. c.*, p. 31. J. V. HAMMER has translated an extract from this work in *Fundgruben des Orients*, Vol. VI, pp. 126-142. Wien, 1818; the text has not yet been edited. Compare WIEDEMANN, *l. c.*, p. 208.

⁵ Edited by P. L. CHEIKHO (*Al-Machriq*, Vol. XI, 1908, pp. 751-765). Compare WIEDEMANN, *Mitt. d. deutschen Ges. für Geschichte d. Med. und Nat.*, Vol. VIII, pp. 509-511. Translation by WIEDEMANN, *Zur Mineralogie im Islam*, p. 225 (Erlangen, 1912). BRETSCHNEIDER (*China Review*, Vol. V, 1876, p. 124) identifies the Persian vase "reflecting what is going on in the world" (mentioned in the Annals of the Ming Dynasty) with the vase of Djemshid frequently spoken of by the Persian poets and said by Rashid-eddin (1247-1318) to have been made of turquois. This identification can hardly be correct, if the tradition holds good that the Persian vase had "the property of reflecting light in such a way that all affairs of the world could be seen." Turquois is dense, opaque, not at all transparent (in composition a hydrous phosphate of aluminum containing water, 20.6 per cent, alumina, 46.8 per cent, and phosphorous oxide, 32.6 per cent), and thus in composition as well as opacity, differs from most other gems (O. C. FARRINGTON, *Gems and Gem Minerals*, p. 170, Chicago, 1903).

⁶ YULE and CORDIER, *The Book of Ser Marco Polo*, Vol. I, p. 90. Marco Polo's itinerary in southern Persia has been elucidated by Gen. A. HOUTUM SCHINDLER (*Journal Royal Asiatic Society*, 1881, pp. 1-8, and 1898, pp. 43-46), further by G. LE STRANGE (*The Cities of Kirmān, ibid.*, 1901, pp. 281-290). On p. 2 of the first of these papers, SCHINDLER has devoted a note to the turquois-mines of the province of Kermān, stating the various localities where they are found; at a place, twelve miles from Shehr-i-Bābek, are seven old shafts, now for a long period not worked, the stones of these mines being of a very pale blue, and having no great value. The inferiority of the Kermān turquois is emphasized also by the Chinese author T'ao Tsung-i in 1366 (see p. 57). And then, one will make us believe that the turquois should be recognized in PLINY's callais "the best sort of which occurs in Carmania," as if there were no other stones to be found in the big country Carmania, and as if it had been proved that turquois was mined there in the first century. But Marco Polo evidently is the first authority with such a report, and from Pliny to Marco Polo there is a far cry. The Arabic author al-Ta'ālībī (961-1038) expressly states that turquois is found only near Nishāpūr (WIEDEMANN, *Zur Mineralogie im Islam*, p. 242). Major P. M. SYKES (*Historical Notes on South-East Persia, Journal Royal Asiatic*

through Persia in 1294 and says of the kingdom of Kermān that the stones called turquoises are produced there in great abundance; they are found in the mountains, where they are extracted from the rocks. Gen. A. HOUTUM SCHINDLER¹ to whom we owe an excellent description from the geological viewpoint of the Persian turquois-mines has not solved the problem as to the antiquity of the mining operations; the late report of Ibn Mansūr is the only document quoted by him.² In one passage (p. 307) we read the general remark: "Seit Jahrtausenden ist in diesen Gruben gearbeitet worden," which is no more than a personal impression. We live in a skeptic age and are not willing to believe so easily in millenniums, if no evidence of hard and cold facts is advanced. Every human activity is defined by time; language and history seem to militate against such an unfounded surmise.³ These observations on the history of turquois in Persia form another reason why I am not at all sanguine in accepting the explanation of *sê-sê* by turquois when such early texts as *Pei shi*, *Sui shu*, and *T'ang shu* come into question and refer to a time when it must be doubted, at least for the present, that turquois was known in Persia or had any significance in her culture. The Chinese accounts plainly refer to Sassanian Persia, while all references to turquois in Persia, at least in the present state of our knowledge, are post-Sassanian.

In our attempts to identify the names of stones mentioned in ancient *Society*, 1902, p. 942) who has studied the archæology of the Kermān region reports on the tombs: "In each tomb were a yellow jar of pottery, round bowls of three sizes, a pair of bracelets, two pins, and some arrow and spear heads, all of which were of bronze except the vessels. In addition, two or three carnelian gems were found, and some small silver earrings and bracelets. The custom of placing a carnelian in a dead man's mouth, with the names of the twelve *Imām* engraved on it, is one that obtains nowadays." There is no report of a find of turquoises in a grave of the Kermān region.

¹ Die Gegend zwischen Sabzwār und Mesched in Persien (*Jahrbuch der k. k. geologischen Reichsanstalt*, Vol. XXXVI, pp. 303-314, Wien, 1886).

² When Ibn Mansūr says that the best mine of those at Nishāpūr is the one discovered by Isaac, the father of Israel, and hence called Isaac's mine, this is certainly a legend without historical value. The account of Ibn Mansūr seems to be pieced together from different sources; the *lapidarium* of Pseudo-Aristotle is evidently utilized (for example, in the statement that turquois is light and brilliant in clear weather, but dim and dull when the sky is clouded). According to RUSKA (*l. c.*, p. 35), matter and arrangement of his work largely depends on Tifāshī. Regarding the Chinese, Ibn Mansūr remarks that they like the *tarmaleh* (a word queried by Schindler), turquoises intersected by other stone, and employ these for the adornment of their idols and women. This is apparently an error and should read "Tibetans" instead of Chinese (compare p. 13). Travelers who visited the mines are quoted by A. V. W. JACKSON (*l. c.*, p. 259).

³ The last (eleventh) edition of the *Encyclopædia Britannica* gives two items of information of a contradictory character. In Vol. XIX (p. 710) mention is made of Mādan, 32 miles N. W. of the city of Nishāpūr, "where the famous mines are which have supplied the world with turquoises for at least 2,000 years." A more moderate attitude is observed in Vol. XXVII (p. 483) where it is said: "In Persia the turquois mines have been worked for at least eight centuries."

records we must never lose sight of the plain facts of archæology, history, and mineralogy. Taking a broader view of the subject we find that ruby and lapis lazuli have been the most prominent jewels of Irān since ancient times, and that both are well attested by the presence of ancient authentic specimens¹ and traceable to a well defined locality. The great jewel-producing district within equal proximity of Sogdiana, Persia and Khotan was the region of Badakshān (in Chinese *P'a-to-shan*), north of the Hindu Kush mountains, well known to the Chinese during the T'ang period, and to every modern mineralogist as a center for the production of two precious stones — lapis lazuli and the balas ruby or spinel.² The former stone entered the horizon of the Chinese

¹ Compare p. 38, note 1.

² MAX BAUER, *Precious Stones*, pp. 278, *et seq.* (German original, *Edelsteinkunde*, 2nd ed., p. 374); O. C. FARRINGTON, *Gems and Gem Minerals*, pp. 96, 202. T. WADA (*Beiträge zur Mineralogie von Japan*, No. 1, p. 20, Tōkyō, 1905) describes spinels originating from China, and R. PUMPEL (Geological Researches, p. 118, *Smithsonian Contributions to Knowledge*, Vol. XV, Washington, 1867) seems to have encountered spinels in Yün-nan. MARCO POLO (ed. YULE and CORDIER, Vol. I, p. 157) has described the ruby and the lapis lazuli mines. They are mentioned by the Arab geographers Iṣṭakri and Ibn Haukal in the tenth century (O. M. DALTON, *The Treasure of the Oxus*, p. 9, London, 1905). Ibn Haukal's passage has been translated by WIEDEMANN (*Zur Mineralogie im Islam*, p. 236, Erlangen, 1912). The Arabic geographer Yaḡūt. (1179–1229) and the historian Maqrīzī (1365–1442) impart notes on the balas ruby of Badakshān (WIEDEMANN, *ibid.*, pp. 235–6); al-Ta'ālībī (961–1038) mentions it (*ibid.*, p. 243). The ancients were familiar with the spinel as evidenced by antique intaglios, but its designation in classical times is not known according to H. BLÜMNER (*Technologie und Terminologie der Gewerbe und Künste bei Griechen und Römern*, Vol. III, p. 236, Leipzig, 1884); but H. O. LENZ (*Mineralogie der alten Griechen und Römer*, p. 17, Gotha, 1861) includes the spinel under the Greek word *anthrax* (likewise DAREMBERG and SAGLIO, *Dictionnaire des antiquités grecs et romains*, Vol. II, p. 1462, and PAULY's *Realencyklopädie*, Vol. XIII, col. 1108). Arabic and Armenian authors relate a legendary tradition that at the time of the dynasty of the Abbassides a terrific earthquake shattered a mountain in Badakshān, in which the spinels appeared (K. P. PATKANOV, *l. c.*, pp. 19–20). The great antiquity of the mining operations in Badakshān is illustrated by the wide diffusion in early times of lapis lazuli. In the words of Marco Polo, that of Badakshān is the finest in the world; YULE (Vol. I, p. 162) comments that the mines of *Lājwurd* (whence *l'Azur* and *Lazuli*) have been, like the ruby mines, celebrated for ages. MAX BAUER (*Precious Stones*, p. 442) states that the material which is not sent to Bokhāra (whence it is traded to Russia) goes, together with rubies of the same region, to China and to Persia, and that the lapis lazuli said to occur in these countries, as well as in Little Bokharia and Tibet, has probably been imported from Badakshān. Moreover, according to this author, the material sold in other parts of Asia, for example, in Afghanistan, Beluchistan, and India, and stated by travelers to occur in those regions, in all probability is imported from the locality in the proximity of the Upper Oxus; the lapis lazuli from which the ancient Egyptian scarabs were cut, as BAUER says, presumably came from Badakshān, as did also the material much used elsewhere in ancient times. The early use of lapis lazuli in ancient Babylonia is well attested by numerous finds (P. S. P. HANDCOCK, *Mesopotamian Archæology*, pp. 76, 102, 315, even for the earliest Sumerian period, p. 340) and the mineralogical analyses of HEINRICH FISCHER (H. FISCHER and A. WIEDEMANN, *Ueber babylonische Talismane*, p. 4, Stuttgart, 1881). It is interesting to note among the beads of Sumerian necklaces coral, lapis lazuli, mother-o'-pearl, and agate — all favorite objects of the Tibetans, to the exclusion of turquois, which evidently belongs to a much more recent stratum of culture in Asia. The origin of Babylonian lapis lazuli seems not yet to have been satisfactorily established. FISCHER suggested Bokharia; H. BLÜM-

at the T'ang period, and likewise from the regions of the Western Turks.¹ As it has a name of its own (*kin tsing*),² and as besides it no other

NER (*l. c.*, Vol. III, p. 275) basing his opinion on Pliny's statement that the best kind occurs in Media (*apud Medos*) is inclined to think of Tibet where it is found at present. This fact is certainly correct (see p. 17, note 2), but Tibet cannot come into question in the times of antiquity, and it seems preferable, at least for the present, to join MAX BAUER in the opinion that the mines of Badakshān are responsible also for Babylonian lapis lazuli. Prehistoric occurrence of lapis lazuli in Beluchistan is mentioned by NOETLING (*Zeitschrift für Ethnologie*, Vol. XXX, 1898, *Verhandlungen*, p. 470); in Armenia by BELCK and LEHMANN (*ibid.*, p. 590). R. LEPSIUS (*Les métaux dans les inscriptions égyptiennes*, p. 31, Paris, 1877) derives the lapis lazuli used by the ancient Egyptians from Badakshān. As to India, the case may be more precisely made out. There, the stone does not seem to be indigenous. G. WATT (*A Dictionary of the Economic Products of India*, Vol. IV, p. 587) says: "Though not known with certainty to occur in India, it is imported into the country, where it is employed for several purposes." The Sanskrit word *rājāvarta* or *lājavarīa* (Hindustani *lājward*, Behar *lājburud*, Guzerati *rājāvaral*) is plainly derived from Persian *lāzuward* (L. FINOT, *Les lapidaires indiens*, p. XVIII, connects it with Arabic *lāzurd*), and the five names enumerated for the stone in the *Rājanighaṇṭu* (R. GARBE, *Die indischen Mineralien*, p. 90), though all couched in a Sanskrit form (with the meaning "suitable for a king's forehead, forehead-jewel") are re-interpretations based on that foreign word (the Petersburg Sanskrit Dictionary, smaller edition, has still another composite name *svarnābha*). TAVERNIER (ed. by V. BALL, Vol. II, p. 156, London, 1889) who wrote in 1676 makes a somewhat vague statement: "Towards Tibet, which is identical with the Caucasus of the Ancients, in the territories of a *Rāja* beyond the Kingdom of Kashmir, there are three mountains close to one another, one of which produces gold of excellent quality, another *grenat*, and another *lapis*." The editor BALL is inclined to think that the *lapis* mine here referred to is near Firgāmu in Badakshān. Lapis lazuli occupies a place in Indian antiquity, particularly among the Buddhists, but this subject is still in need of special investigation.

¹ CHAVANNES, Documents, p. 159, and *T'oung Pao*, 1904, p. 66. But lapis lazuli was perhaps known to the Chinese to a certain extent from the second century A. D. (compare F. HIRTH, *Zeitschrift für Ethnologie*, Vol. XXI, 1889, *Verhandlungen*, p. 500, or *Chinesische Studien*, p. 250). HIRTH refers to the "gold girdles set with blue stones from Hai-si" presented to the Chinese Court in 134 A. D. by the king and minister of Kashgar, further to a definition in the glossary *T'ung su wên* from the end of the second century where the expression "to paint the eyebrows" is explained as a cosmetic yielded from blue stone (*ts'ing shi*) where ultramarine, a pigment obtained from lapis lazuli, is evidently in question. This is well confirmed by the report of the *Sui shu* on the country of Ts'ao identified by HIRTH with Badakshān or the plateau of the Pamir (an identification overlooked by CHAVANNES, Documents, p. 130), where it is said that Ts'ao produced among other articles *ts'ing tai*, that is, ultramarine for cosmetic purposes. HIRTH does not state the fact that Badakshān is the old classical land of lapis lazuli; but just this lends force to his conclusion that the ancient cosmetic used by the Chinese was of mineral, and not, as later Chinese authors believed, of vegetal origin.

² As I expect to show on another occasion, there is, besides *kin tsing*, an ancient term *kin sing shi*, "stone with golden stars," for the designation of lapis lazuli. This is mentioned as a product of Tibet (*T'u-po*) in *Kiu Wu tai shi* (Ch. 138, p. 1 b), as a product of Khotan in the Geography of the Ming Dynasty (*Ta Ming i t'ung chi*, edition of 1461, Ch. 89, fol. 25 a), and as a product of Sze-chou fu (in the province of Kuei-chou) in the Geography of the Ts'ing Dynasty (*Ta Ts'ing i t'ung chi*, Ch. 398, p. 3 b); compare further *Pên ts'ao kang mu*, Ch. 10, p. 10 a. The word *kin sing* reflects the same notion as connected by the ancients with the same stone (called *sappheiros*, *sapphirus*, a word of Semitic origin: O. SCHRADER, *Realexikon*, p. 152), described by them as a blue stone with brilliant dots of gold (the small quantity of sodium sulphide present in the stone being taken for gold), and likened to the starry sky (compare BLÜMNER, *l. c.*). The modern Chinese name for lapis lazuli is *ts'ing kin shi*, that is, "dark-blue gold stone." In the Dictionary of Four Languages by the Emperor K'ien-lung, this word is rendered into Manchu by *nomin*, Tibetan

important jewel is found within this dominion than the balas ruby or spinel, no other alternative can be seen at present than that, generally speaking, the *sê-sê* is in all probability to be identified with the latter; while in some cases where carvings and building material are mentioned, as will be seen, the onyx might be conjectured.

I have further arrived at the conclusion that, as far as precious stones are concerned, two different species should be understood by the name *sê-sê*,—as far as the Iranian regions are involved, the balas ruby of Badakshān; and, as far as ancient Tibet comes into question, in all likelihood the emerald.

Further evidence may first be adduced for the proposed identification with the balas ruby. The balas ruby is now called in Chinese *pi-ya-se*,¹ correctly translated as early as 1820 by ABEL-RÉMUSAT² with "le rubis balais"; the Chinese word, according to this author, is derived from *balash* or *badaksh*, whence, as he says, the name of the country Badakshān is derived; but more probably, the name of the jewel is derived from the name of the locality.³

The recent valuable paper of E. WIEDEMANN,⁴ allows us to trace the etymology of this Chinese word. Discussing the balas ruby of Badakshān (in Arabic *al balachsh*), al-Berūnī maintains that the best

by *mu-men*, Mongol by *nomīn* or *momin*, all of which have the same meaning. ABEL RÉMUSAT (Histoire de la ville de Khotan, p. 168) adds the Uigur word *nachiver* which he says is derived from Persian *ladjiver* (*lazvard*). The English and Chinese Standard Dictionary (Vol. I, p. 1308, Shanghai, 1910) translates lapis lazuli by *lan liu-li*. In the Mongol period the Chinese name for lapis lazuli was *lan ch'i* (BRETSCHNEIDER, Mediaeval Researches, Vol. I, p. 151, and *Chinese Recorder*, Vol. VI, 1875, p. 16) doubtless derived from the Persian or Arabic word. It seems to me that the character *lan* "orchid" (No. 6721) used by Ch'ang Tê in writing this word is an error for *lan* "indigo, blue" (No. 6732); the name of the capital of Badakshān where lapis lazuli was mined was *Lan shi*, "Blue Market" (CHAVANNES, *T'oung Pao*, 1907, p. 188), a designation which apparently refers to the blue color of lapis lazuli.

¹ GILES, Dictionary, No. 9009, who translates "a kind of cornelian", which is not correct.

² Histoire de la ville de Khotan, p. 168. The identification is based on the Dictionary in Four Languages (see below p. 48, note).

³ YULE and BURNELL (Hobson-Jobson, p. 52) state in regard to the word *balas*: "It is a corruption of *Balakhshī*, a popular form of *Badakhshī*, because these rubies came from the famous mines on the Upper Oxus, in one of the districts subject to Badakshān," and quote also Ibn Baṭūṭa as saying that the mountains of Badakshān have given their name to the Badakhshī ruby.—EITEL (Handbook of Chinese Buddhism, p. 131), I believe, is quite right in recognizing in *rohītaka* or *lohītaka* the Sanskrit word for the balas ruby, for the other Sanskrit words employed for the ruby, as shown by L. FINOT (Les lapidaires indiens, p. XXXIX), refer to such species as are found in India. We are much in need of a careful and critical study of all the names of precious stones to be found in Buddhist Sanskrit and Pali literatures, and these should certainly be examined in connection with the corresponding Chinese and Tibetan renderings; the Buddhist nomenclature, in many cases, deviates from that of the Indian mineralogists.

⁴ Ueber den Wert von Edelsteinen bei den Muslimen (*Der Islam*, Vol. II, 1911, p. 349).

sort is the *pijāzakī*, that is, the one coming from the district of Pijāzak. I am inclined to think that we may look upon this word as the source of the Chinese transcription *pi-ya-se*, whereby its meaning is moreover confirmed. It is true the Chinese word is not traceable earlier than the eighteenth century, but it is doubtless a much more ancient word of the colloquial language which for this reason was not registered in the standard dictionaries; it is, however, entered, as numerous other colloquial words, in the "Dictionary in Four Languages" published by the Emperor K'ien-lung. Mention is made of *pi-ya-se* in the "Statutes of the Manchu Dynasty" (*Ta Ts'ing hui tien t'u*, Ch. 43, p. 5) where they are granted as a privilege to all imperial court-ladies to be worn on their sable caps.¹ There is, however, an older trace of the word in a source of the Mongol period where, in my opinion, it has been misjudged by Bretschneider. The Chinese traveler Ch'ang Tê, who was despatched in 1259 by the Mongol Emperor Mangu as envoy to his brother Hulagu, king of Persia, and whose diary, under the title *Si shi ki*, was edited in 1263 by Liu Yu, reports that a precious stone by the name *ya-se* of five different colors and of very high price is found on the rocks of the mountains in the south-western countries. BRETSCHNEIDER² is inclined to identify this word with the Arabic *yashm* or *yashb*, our word jasper, which seems to me very improbable. The stone *ya-se* is mentioned by Ch'ang Tê together with lapis lazuli

¹ The character *pi* in the word *pi-ya-se* may explain also why the *sê-sê* are designated by some authors as *pi* "green," which may simply be due to a reminiscence of the word *pi-ya-se* where the word *pi* enters as an attempt at reproducing a foreign sound. Besides, al-Bērūnī, in the passage quoted by WIEDEMANN, speaks of four color variations in the balas ruby,—red, violet, green and yellow. The Armenian *lapidarium* (K. P. PATKANOV, *l. c.*, p. 19) ascribes to spinels a red color, the colors of the garnet, of fire, of vinegar, of wine, of the scorpion, and of peas. A. BOETIUS DE BOOT (*l. c.*, p. 149) states in regard to the color of *Rubinus Balassius*: "Habet iste Rubinus laccæ florentinæ, aut cremesinum colorem, ita ut parum cærulei coloris vero rubro admixtum videatur, rosei coloris rubentis instar." R. MIETHE (in KRÄMER, *Der Mensch und die Erde*, Vol. V, p. 377) describes spinels as black or brown-black, frequently brownish, rarely green and blue. O. C. FARRINGTON (*Gems and Gem Minerals*, p. 96), besides red, gives also the colors orange, green, blue, indigo, white and black. MAX BAUER (*Precious Stones*, p. 297) has the following: "Spinel of a rose-red or light shade of color inclined to blue or violet are referred to as 'balas rubies.' They not infrequently combine with this character a peculiarly milky sheen which considerably detracts from their value. Stones the color of which is more decidedly blue or violet resemble, although much paler, some almandines, and are known as 'almandine spinels.' Violet spinels, which are not too pale in color, often resemble both the true amethyst and the 'oriental amethyst,' and indeed have sometimes been put on the market under the latter name." Blue and black spinels are discussed by the same author on p. 299. Red and purple balas rubies are distinguished also by Yang Shên (*Ko chi king yüan*, Ch. 33, p. 1) who, according to MAYERS (*Chinese Reader's Manual*, p. 270) lived from 1488 to 1559 (GILES, *Biographical Dictionary*, p. 912, sets the date of his death at 1529; but WYLIE, *Notes on Chin. Lit.*, p. 154, assigns 1544 to one of his works).

² *Mediaeval Researches*, Vol. I, p. 151, and *Chinese Recorder*, Vol. VI, 1875, p. 16 (where the Chinese characters are given).

(*lan-ch'i*) as occurring in the same locality, and since Badakshān is the locality producing lapis and balas ruby, the greater probability is that Ch'ang Tê's *ya-se* is identical with *pi-ya-se*, the balas ruby of Badakshān. The fact that Ch'ang Tê, in writing the name, employs other characters than those in use at later times is certainly not in the way of this identification. On the other hand, as stated above (p. 33, note 5), Ch'ang Tê notices in the palace of the Caliph *sê-sê* together with lapis lazuli, and hence it may be concluded that his *sê-sê* is identical with *ya-sê*, i. e. that *sê-sê* is the balas ruby of Badakshān. And if it is permissible to interpret the word *liu-li*, occurring in the account on Persia in the *Sui shu* (Ch. 83, p. 11 b) and having its place between coral, agate and crystal, in the sense of lapis lazuli, we are there confronted with an analogous case. The great antiquity of lapis lazuli in Egypt and Western Asia, corresponding to its relatively early appearance in China, leads one to the inevitable conclusion that also balas ruby, originating from the same mines, must be of proportionately equal age.

From the few accounts we have in regard to the *sê-sê* — there is no contemporaneous description of them — we cannot surely be too positive on the subject of identification. But the spinel or balas ruby tentatively proposed suits the situation far better than the turquoise, for it is a precious stone, it was found (and still is found) in the heart of those regions participating in the property of *sê-sê*, and is well authenticated historically and archæologically. The word *sê-sê* is evidently not Chinese, but derived from a foreign language; it may be either a Chinese attempt at transcribing a Turkish or Persian designation of the stone, or the name of some locality, mountain or river.¹

¹ Marco Polo's designation of the mountain where the balas ruby is mined, *Syghinan* = *Shighnān*, is very suggestive as a possible foundation of the word *sê-sê* (Cantonese: *sok-sok*). It is also significant that the ancient Chinese name for Shighnān is recorded in the Annals of the T'ang Dynasty in the form *Sê-ni* or *Sê-k'i-ni*, and that this syllable *sê* is written with the same character as used in the jewel *sê-sê* (see CHAVANNES, Documents sur les Tou-kiue occidentaux, pp. 162, 322). It is therefore possible, after all, that *sê-sê* derives its name from this locality and means "stone of Shighnān," — a case from a philological point of view analogous to the above mentioned *pijāzaki* and *badakshī*. During the Mongol period the balas ruby is designated *la* in the *Cho keng lu* (Ch. 7, p. 5 b, edition of 1469), — a word which is traced by BRETSCHNEIDER (Mediaeval Researches, Vol. I, p. 173) to Persian *lāl*. The Chinese author T'ao Tsung-i — a fact not mentioned by BRETSCHNEIDER — states that this word is only dialectic. The adoption of this foreign word indicates a change in the commercial conditions; in the T'ang period the balas rubies were traded to China from the country of the Western Turks (Khotan), in the Mongol period from Persia. An error of Bretschneider here deserves correction. The *Cho keng lu* enumerates four red stones and expressly says that they come from the same mine; since the balas ruby is mined in Badakshān, the three others, viz., *pi-che-ta*, *si-la-ni*, and *ku-mu-lan*, must be derived from the same locality, and it is impossible to conjecture with Bretschneider that *si-la-ni* probably means "from Ceylon" — a view untenable also for philological reasons. The *pi-che-ta* corresponds to Arabic *bigādī*, "garnet" (WIEDEMANN, *Der Islam*, Vol. II, p. 352, and Zur Mineralogie im Islam, pp. 217, 236, Erlangen, 1912). If Bretschneider adds that nowadays the

We noticed from the statements of the *Pei shi* and *Sui shu* that *sê-sê* are attributed to the Persians, and from the *T'ang shu* that these jewels were known in Syria. In the epoch of the T'ang dynasty (618-906) the three great religions of Western Asia, Mazdeism, Nestorianism and Manicheism reached a high degree of expansion and spread over

name for ruby in China is *hung pao shi* ("red precious stone"), it should be understood that this is not the balas ruby, but the Burmese ruby (see also G. E. GERINI, *Researches on Ptolemy's Geography*, pp. 39, 741, London, 1909). Russian manuscripts of the seventeenth century mention expressly "Chinese *lâl*" (K. P. PATKANOV, *l. c.*, p. 21) which goes to show that spinels really existed in China and were traded from there to Russia. JULIUS RUSKA (*Das Steinbuch des Aristoteles*, p. 32) doubts the correctness of the identification of the Persian word *lâl* with the spinel, and is inclined to regard it as tourmalin, as it is stated that the colors of the stone are red, yellow, violet and green (which, however, is no conclusive argument), that the same stone is often half red and half green, that it is found in a matrix of white stone, and smaller stones frequently lie around a bigger one. I have no judgment on this matter, but wish to point out on this occasion that it is impossible to reach any certain results in this line from the Chinese field of research, before our colleagues in the Persian and Arabic quarters have satisfactorily settled their questions and furnished us with the material to build our conclusions. From a purely philological point of view, however, it does not appear that Ruska's opinion can be upheld. There can be no doubt that the word *pijâzaki* denotes the balas ruby, and that the Chinese word *pi-ya-se* phonetically corresponds to it. The Imperial Dictionary in Four Languages renders this Chinese term by the Tibetan and Mongol words *nal* and Manchu *langca* (LAUFER, *Jade*, p. 109, note 3); these two forms are nothing but variations of the Persian word *lâl*, and consequently Persian *lâl* must designate the balas ruby, so it does also in Osmanli and some other Turkish dialects which have adopted this word. Likewise in Russian the spinel was known under the name *lâl* in the seventeenth century (K. P. PATKANOV, *l. c.*, p. 20). Dr. Ruska, to whom I submitted this observation, was good enough to write me that he does not mean to reject in principle the interpretation of *lâl* by spinel, but mainly wishes to point out the difficulties of the case arising from the confused descriptions of the stone. He thinks the green color is so rare in this mineral that it is impossible that the same stone should be often half green and half red, a feature which, however, not seldom occurs in tourmalin (especially with neutral, colorless intermediary zone). He further states that he has no doubt of the correctness of the equation *pi-ya-se* = *pijâzaki* and *nal* = *lâl*, and obligingly refers to the fact that the word *pijâzaki* is contained also in VULLERS' *Lexicon Persico-Latinum* with the additional form *piyâzi* which comes still nearer to the Chinese word. According to VULLERS, *pijâzek* is the name of a district where are the mines of the *lâl*. As the word *pijâz* means "onion," it was wrongly translated into Arabic as *başalî* "onion-like *lâl*," and even *pijâzi* was perhaps understood in this sense. Dr. Ruska refers to a study on Qazwîni now in print, where he has commented on this subject. Meanwhile E. WIEDEMANN (*Zur Mineralogie im Islam*, p. 216) has commented on Dr. Ruska's opinion in a translation of al-Akfâni's mineralogy, who identifies *al-balachsh* with Persian *lâl*. Wiedemann, on the ground of the specific gravities given by al-Khâzîni, holds that in this case *lâl* should be translated by ruby-spinel, but admits that in other cases it could signify tourmalin. With obliging courtesy Dr. Ruska has recently sent me a proof of the note previously referred to (the above remarks were jotted down a year ago) where he says that the identification of the *lâl* with the *balachsh*, the stone of Badakhshân, and with the *rubis balais* is confirmed by al-Akfâni; but he adds: "This does not exclude a freer usage of the word for all possible red gems, for who might say that the only then known means of their distinction, the determination of specific gravity, has always been employed?" This result is entirely satisfactory, and we return to the former conclusion that *lâl*, in general, designates the balas ruby, with the restrictions made by Dr. Ruska. In no case can it certainly be expected that any Oriental names of minerals, plants, or animals will exactly coincide with our scientific species; it is always necessary to grant the former a certain latitude. But for purposes of translation we have to adhere to the one principal notion connected with the object.

Central Asia, also into China. A curious document allows us to establish the fact that it was representatives of these religions, in all likelihood Manicheans, who brought these jewels to China. This text occurs in the *Shu tien*, a collection of interesting notes on the province of Sze-ch'uan, compiled in 1818 by Chang Chu-pien (4 vols., reprinted in 1876). The passage (in Ch. 8, p. 5)¹ is derived from the *Hua yang ki*, a work containing records relative to Sze-ch'uan, whose time and authorship is not known to me.² The text runs as follows: "The family K'ai ming³ erected a several-storied building of seven precious objects; there were screens composed of connected genuine pearls. At the time of Emperor Wu (B. C. 140-87) of the Han dynasty, a conflagration in the district of Shu (Sze-ch'uan) destroyed several thousand houses, and even several-storied houses were consumed by the flames. At the present time people constantly find genuine pearls preserved in the sandy soil.—Chao Pien,⁴ in his work *Shu tu ku shi* ("Ancient Affairs of the Capital of Sze-ch'uan"), says: "The Monoliths are outside of the west gate of the Yamen, two shafts being extant. This is the site of the building of the genuine pearls. Formerly people of Central Asia (*Hu jên*) erected at this spot a Temple of Ta Ts'in (*Ta Ts'in sze*) with gates and storeys consisting of ten rooms. By means of genuine pearls and bluish jade (*ts'ui pi*) which were strung, they made screens. Later on, this building was destroyed and fell into ruins. Even now whenever a big rain has fallen, people pick up at this place genuine pearls, *sê-sê*, gold, blue jade, and strange things. The poet Tu Fu (712-770), in his 'Poem on the Monoliths' has the verse: 'During a rainfall, they constantly obtain *sê-sê*,' which is an allusion to this affair."⁵

¹ It is quoted with exactly the same readings also in *Ko chi king yüan*, Ch. 32, p. 7. The same story is narrated in the *Nêng kai chai man lu* (edited in *Shou shan ko ts'ung shu*, Vols. 70, 71; Ch. 7, p. 22 b) by Wu Tsêng of the twelfth century (WYLIE, Notes on Chinese Literature, p. 160), which goes to prove that the story was known in the Sung period. Also Wu Tsêng connects this tradition with the verse of Tu Fu (712-770) relative to the finds of *sê-sê* at a rainfall; this is the heading of his essay, and the story is given in explanation of the poem which in our text, as translated above, follows at the end. If this interpretation is correct, the event of the destruction of the temple of Ta Ts'in must have happened contemporaneously with, or prior to the age of, Tu Fu. Thus, the Ta Ts'in temple here in question may have been founded toward the end of the seventh or in the beginning of the eighth century.

² It is not identical with the *Hua yang kuo chi*, ancient records of Sze-ch'uan by Ch'ang K'ü of the Tsin dynasty.

³ According to an information received by M. PELLIOU, *K'ai ming* is the name of the later Emperor Ts'ung; he is identical with the personage called Pie Ling in GILES (Biographical Dictionary, No. 2071). His record is contained in *Hua yang kuo chi* (ch. 3, p. 2).

⁴ An official of the Sung period (994-1070), celebrated for his integrity and benevolence, popularly known as "the Censor with the Iron Face," acted as governor of Sze-ch'uan (GILES, Biographical Dictionary, p. 73). The *Nêng kai chai man lu* designates him by his posthumous name Chao Ts'ing-hien.

⁵ Wu Tsêng, after giving the text of this tradition as above, winds up with a comment on the precious stones and pearls of the country of Ta Ts'in (the Roman

Ta Ts'in is the peculiar name hitherto unexplained in its origin by which the Roman Orient was known to the Chinese, a subject ably and thoroughly discussed by Prof. HIRTH in his book "China and the Roman Orient" on the basis of all available documents. The "Ta Ts'in temples or churches" are first mentioned in Chinese records for the year 631 when the magus Ho-lu arrived from Persia at Si-ngan fu, and an imperial edict ordered to establish in the capital a temple of Ta Ts'in.¹

In the year 745 an edict was issued that the Manichean churches heretofore called "Persian temples" should throughout the empire change this designation into "temples of Ta Ts'in."² The tenor of this edict leaves no doubt that the Manicheans are understood: for the purpose of the imperial order is to do justice to the true name of their religion; their places of worship had heretofore been called "Persian" for the mere reason that they had hailed from Persia, but the foundation of their religion was Christian and had originated in Ta Ts'in, in Syria. I am therefore inclined to think that also in the above text the "Temple of Ta Ts'in" should be identified with a Manichean church. If this document can be looked upon as authentic we here have the interesting fact, which I believe was not known before, that the Manicheans, probably in the first part of the eighth century, had extended their settlements to far-off Sze-ch'uan, and the point at issue in this connection is that they must have brought over to Sze-ch'uan a large quantity of precious stones, among these *sê-sê* or balas ruby. In this case it should rather be positively asserted that the turquois is out of the question. The mere idea that the Manicheans should have employed turquois, and especially in combination with genuine pearls and precious jades, for the decoration of their churches, seems absurd. Precious stones played a significant part in the religious system and symbolism of the Manicheans, and as their religious notions centered around the

Orient) and concludes that the founders of the temple have therefore been indeed men from the country of Ta Ts'in. It will be seen from the *P'ei wên yün fu* (Ch. 93 B, p. 85) that under the word *sê-sê* a passage from the History of the Liao Dynasty (*Liao shi*, chapter on Rites) is quoted to the effect that "Jo-han selected an auspicious day to practice the ceremony of *sê-sê*, in order to pray for rain." This word *sê-sê* has nothing to do with the jewel in question, but is a word of the Tungusic language of the Khitan, *seseli* (explained as such in *Liao shi*, Ch. 116, p. 4 b), meaning a ceremony of rain-prayer, in which no stone at all is employed but a willow at which a lance is thrown by the emperor, the princes and ministers. The ceremony is fully described in the second chapter of the *Liao shi* (see H. C. V. D. GABELENTZ, *Geschichte der grossen Liao*, p. 31; further *Liao shi*, Chs. 27, p. 3; 55, p. 1 b; 56, p. 1 b). The K'ien-lung scholars identify the Khitan word with Manchu *sekseri* (*K'in ting Liao shi yü kiai*, Ch. 10, p. 1).

¹ CHAVANNES, *Le Nestorianisme* (*Journal asiatique*, 1897, p. 61).

² This edict has been translated by CHAVANNES (*l. c.*, p. 66) and PAUL PELLIOT (*Bulletin de l'Ecole française d'Extrême-Orient*, Vol. III, 1903, p. 670).

dualistic principle of light and darkness, it is evident that brilliant jewels were conceived by them as emblems of light and for this reason were employed in their churches.¹

Several examples of this kind may be gleaned from the newly discovered Manichean treatise brilliantly translated by M. CHAVANNES and M. PELLIOU in collaboration.² Compassion is likened there to "the precious pearl called the bright moon which is the first among all jewels" (p. 67). The Messenger of Light is compared with "the perfumed mountain, vast and grand, of all jewels," and with "the precious diamond pillar supporting the multitude of the beings" (p. 90). "Our heart has received the majestic splendor of the pearl granting every wish," it is said at the end of this treatise (p. 92). Such like thoughts may explain the utilization of pearls in the Manichean church of Szech'uan. We know also that the adherents of Mani were fond of flowers, perfumes and ornaments, and in the same book (p. 61), there is even a legend in regard to the origin of jewels which seems to be connected with their beliefs of resurrection. The dying Manichean was adorned with rich ornaments (apparently symbolic of light) to be prepared for admission into the luminous regions. The gods approach the dead with ornaments which have the effect of putting the present devils to flight.³ It does not seem to be known what symbolism the Manicheans attached to the balas ruby.⁴ But as the lost literature of

¹ The basis of this symbolism certainly is to be traced to the writings of the New Testament, especially REVELATION XXI, 18-21, and presents the counterpart to the mystic and moralizing ideas associated by mediæval Christian writers with the twelve precious stones in the breastplate of the Jewish High Priest, the twelve jewels forming the foundations of the wall of Heavenly Jerusalem just referred to, and the jewels in the crown of the Virgin. Among the latter, the balas ruby appears in the fifteenth century in the story of the visions of Sainte Françoise where four other stones not figuring among the twelve of the Bible are listed,— the diamond, garnet, carnelian and turquois (L. PANNIER, *Les lapidaires français du moyen âge*, p. 225, Paris, 1882; see *ibid.*, pp. 280-2, on the mediæval beliefs regarding balas ruby). DANTE (*Paradiso IX*, 67) extols the lustre of the *balascio*: *L'altra letizia, che m'era già nota Preclara cosa, mi si fece in vista Qual fin balascio in che lo sol percota*. The ruby, in general, was emblematic of glory, and with predilection, chosen for the rings of the bishops (H. CLIFFORD SMITH, *Jewellery*, p. 148, New York, 1908, and D. ROCK, *Church of our Fathers*, Vol. II, p. 171, London, 1849, where a gold pontifical ring with a sapphire surrounded by four balas rubies is mentioned).

² *Un traité manichéen retrouvé en Chine. Extrait du Journal asiatique*, Paris, 1912.

³ G. FLÜGEL, *Mani, seine Lehre und seine Schriften*, pp. 268, 339 (Leipzig, 1862).

⁴ Some of the symbolism associated with the spinel in western Asia may be gleaned from the Armenian *lapidarium* translated into Russian by K. P. PATKANOV (p. 19): "The spinel shares with the ruby in the quality that it quenches thirst, as soon as it is placed in the mouth. When pounded and mixed with a medicinal extract, it gladdens man and removes from him grief and sorrow. Mixed with an unguent and administered to the eyes, it strengthens their vision and renders man farsighted. Its nature is warm and dry. The sages say that the wearing of a spinel protects one from all diseases, from pain in the loins; it safeguards man from bad dreams and devils. The wearer of a spinel becomes agreeable to people."

this religion is gradually being rediscovered thanks to the scholarship of F. W. K. Müller, Le Coq, Pelliot and Chavannes, there is hope that the future will reveal this fact, and that also the puzzling word *sê-sê* will occur in the writings of the Manicheans.¹

I have no definite opinion as to the indigenous *sê-sê* mentioned in the Sung period and in the fanciful stories of the T'ang dynasty. It is evident that neither the spinel nor the turquois is here involved, but that it is the question of some Chinese stone of fine appearance which is beyond the possibility of positive identification, as the accounts are too vague and elastic. It is manifest that *sê-sê* was a favorite word in the age of the T'ang, perhaps owing to its pleasing rhythm, that the far-off countries where the jewel was first discovered lent it a nimbus of romance, and that the name could easily be transferred to other similar stones. If I am allowed to express a personal opinion, I may say that this kind of *sê-sê* possibly refers to onyx. We see from Pseudo-Aristotle's *Lapidarium*² that China was known to the Arabs as a place of production for onyx, and it might even be conjectured that the Arabic word for onyx *djaza* (Persian *djiza*) which has penetrated into Sanskrit in the form *çesha*³ and into Tibetan in the form *zê*⁴ may have been instrumental in the shaping of the Chinese word *sê-sê* of this meaning. The existence of onyx in ancient China has not been heretofore recognized, because the indigenous word for it, on traditional convention, was accepted to have the meaning of jade, nobody knowing what kind of jade was understood. This is the compound *pi yü* (Giles's Dictionary, No. 9009) usually translated "greenish or bluish jade." A. FORKE⁵ was the first to express his doubts of the correctness of this translation, and to point out that there are Chinese authors who distinguish *pi yü* from jade. Now we find in the English and Chinese

¹ We could perhaps even go so far as to connect the importation of rubies into China with the Manicheans. According to the Arabic author Qazwîni (1203-83) there were several kinds of precious stones like rubies and others, and plenty of gold in Sandâbil, identical with Kan-chou, the capital of the kingdom of the Tangutans (Chinese *Si-hia*, 1004-1226), and according to him, Manicheans lived there at the same time and enjoyed there perfect liberty (compare J. MARQUART, *Osteuropäische und ostasiatische Streifzüge*, pp. 87-88, Leipzig, 1903).

² JULIUS RUSKA, *Das Steinbuch des Aristoteles*, p. 145, Heidelberg, 1912. Also Ibn al-Baitâr, 1197-1248 (L. LECLERC, *Traité des simples*, Vol. I, p. 354, Paris, 1877), makes the statement that onyx is found in Yemen and in China. Regarding onyx in Persia compare G. P. MERRILL, *The Onyx Marbles*, pp. 577-9 (*Report of U. S. National Museum*, 1893). See further E. WIEDEMANN, *Zur Mineralogie im Islam*, pp. 245-9 (Erlangen, 1912).

³ L. FINOT, *Les lapidaires indiens*, p. XVII (Paris, 1896).

⁴ Mr. ROCKHILL (*The Ethnology of Tibet*, p. 692) tells us that he has seen in certain portions of Tibet (Miri, near Shobando, for instance) the men wearing necklaces of coral beads and a substance which he believes is onyx, and which is called by them *zê*.

⁵ *Mitteilungen des Seminars für Orientalische Sprachen*, Vol. VII, 1904, p. 147.

Standard Dictionary published in 1908 by the Commercial Press of Shanghai (Vol. II, p. 1561) the word onyx translated by this very term *pi yü*¹ (also by *tai wên ma-nao*, "streaky agate"), and I have no doubt that also in ancient texts the word *pi yü* designates the onyx. Thus, for example, in the account of Ta Ts'in given in the *Wei lio*² where the five-colored (that is, variegated) *pi*, in my opinion, is onyx; likewise the pillars in the country of Fu-lin, as reported in the *Kiu T'ang shu* (see above p. 27) were of onyx or *sê-sê*. In the older account of the *Wei lio* compiled prior to the year 429 A. D., the Chinese designation is still retained, while in the epoch of the T'ang a preference was manifested for the West-Asiatic name which was then transferred also to the home product. In this manner, a plausible explanation may be found for the occurrence of *sê-sê* on Chinese soil, for the use of this word with reference to the Roman Orient, and particularly for the carvings described in the traditions of the T'ang period and in the archæological works of the Sung dynasty, which could have indeed been made of onyx, a stone material ranking next to jade in Chinese eyes.³ The difficulty of research in this line is enhanced by our lack of knowledge of the mineralogy of China, so that we are still deprived of a solid scientific foundation for our studies.

¹ This is likewise the case in the German-Chinese Dictionary published by the Catholic Missionaries of South-Shantung, p. 613 (Yen-chou fu, 1906).

² HIRTH, China and the Roman Orient, pp. 73, 113.

³ There are two references pertaining to Herat and Samarkand in a text of the fifteenth century where the word *sê-sê*, without any doubt, signifies a building-stone. In 1415 Ch'ên Ch'êng returned to China from a journey through Central Asia which had taken him through seventeen different countries. He published the information gathered by him in a book entitled *Shi si yü ki*, "Record of an Embassy to the Western Regions" (compare *Ming shi*, Ch. 332, and BRETSCHNEIDER, *China Review*, Vol. V, 1876, p. 314). The original seems to be lost, but extracts from it are quoted in the Imperial Geography of the Ming Dynasty (*Ta Ming i t'ung chi*, edition of 1461). Under the heading of Herat (*Ho-lie*), Ch'ên Ch'êng is cited as saying (Ch. 89, fol. 23 b): "They are fond of clean clothing which is white in color, and which is exchanged for dark in case of mourning. The windows and walls of the palace in which the ruler of this country lives are adorned with gold, silver, and *sê-sê*." With reference to Samarkand the same author reports (*ibid.*, fol. 22 b): "There are many workmen there skilful in all handicrafts and clever in erecting palaces, buildings, gates, and pillars, with carvings in open work, and with windows connected by *sê-sê*." Both turquois and balas ruby are out of the question in these two cases; it is a building-stone, and most probably the onyx, which is here referred to.—As our knowledge of ancient Chinese sculpture advances, we may hope to obtain several exact definitions for the ancient names of stones, as in many of the votive inscriptions engraved in the monuments the name of the stone is expressly stated (though most frequently only the designation "stone image" is employed). The term *yü shi* (*lit.* jade stone) mentioned by PELLIOU (*T'oung Pao*, 1912, p. 435) is also well known to me as occurring on Buddhist statuary of the Wei and T'ang periods, and it had never been assumed by me that it has the meaning of jade; *yü shi*, as also PELLIOU says, means a jade-like stone, probably only a highly prized or valuable stone. The term *yü Fu* (*lit.* jade Buddha) may have well been employed in the figurative sense of "precious Buddha." The word *sê-sê* I have not yet traced in the inscription of any sculpture, but it is possible that it will turn up some day or other.

The problem as to the precious stones utilized by the T'ang dynasty could very well be solved in the Imperial Treasury (Shōsōin) of Nara, Japan, if an experienced mineralogist might be admitted there to make a close investigation of the numerous precious stones lavished on Chinese objects of that period. In the *Tōyēi Shuko* published by the Imperial Household where these treasures are splendidly illustrated, but inadequately described, the importance of this subject is overlooked. We read, for example, on p. 5 of Vol. I of discs used in playing games, 35 of crystal, 35 of amber, 20 of yellow lapis lazuli, 20 of azure lapis lazuli, 15 of slightly green lapis lazuli, 15 of green lapis lazuli; in the description of swords, green lapis lazuli is repeatedly mentioned. Needless to say there is no yellow or green lapis lazuli, and that these definitions rest on guesswork, not on investigation. But the same remark holds good for most of our archæological collections. A competent examination of the intaglios discovered in Turkistan, especially Khotan, and of the engraved gems of the Sassanian period of Persia would likewise yield new results for this interesting branch of research.

At a future date, precious stones will occupy a prominent place also in Chinese archæology, and the practical utility of studies like the present one will then become manifest. Already now the fact is apparent that precious stones are found in Chinese graves, and there is a certain number of them (especially lapis lazuli, carnelian, agate, and others as yet undefined) in the collections of the Field Museum. But for lack of evidence this subject is difficult to treat at present. Turquoise, as far as I can judge, and as far as I know from Chinese experts, has not yet been discovered in any Chinese grave. The day will not be far when also Chinese archæology will be based on the actual evidence of the finds, and — *qui vivra verra*.

In regard to Tibet a plausible interpretation may be offered, and the Chinese transcription *sê-sê* referring to a jewel greatly prized by the ancient Tibetans seems to be traceable to a Tibetan word. There is a Tibetan word *zê* (or *zê-ba*, *ba* being only a suffix), a different word from the one mentioned before, which in the Tibetan-Sanskrit dictionaries is translated by Sanskrit *açmagarbha*; the latter is, according to the *Rājanighaṇṭu* (ed. GARBE, p. 77), an epithet of the emerald, and Tibetan *zê* (= Chinese *sê-sê*) would accordingly designate the emerald.¹ This identification is quite in keeping with what Chinese authors report

¹ Compare the Chinese word *she-she*, "emerald," cited by PALLADIUS (see above p. 25, note 1). It is noteworthy that the Chinese accounts of *sê-sê*, in a measure, present a curious analogy with the notices of the emerald on the part of the ancients, in that the latter have mingled with the genuine emerald other statements which cannot relate to the latter, for example, fabulous reports on Egyptian emeralds four cubits long and three cubits wide, and on obelisks of emerald (H. BLÜMNER, *l. c.*, Vol. III, p. 239, and LESSING, *Briefe antiquarischen Inhalts*, XXV).

regarding the high value of *sê-sê* in Tibet. Also the Tibetan word *mar-gad*, derived from Sanskrit *marakata*, sufficiently shows that the Tibetans were acquainted with the emerald. Capt. A. GERARD, speaking of the people of Spiti in the extreme western part of Tibet, remarks that they have beads of coral and other precious stones which resemble rubies, *emeralds* and topazes.¹ The surface of a mausoleum in Yamdo Samding is studded over with large turquoises, coral beads, rubies, *emeralds* and pearls.² SAMUEL TURNER,³ in "a list of the usual articles of commerce between Tibet and the surrounding countries," has registered emeralds exported from Bengal to Tibet.

ABEL-RÉMUSAT⁴ has wrongly ascribed the meaning of emerald to the word *lü-sung shi*, meaning "turquoise"; on the other hand he erroneously translates by "chrysolith, or perhaps turquoise" the Chinese word *tsie-mu-lu*, corresponding to Manchu *niowarimbu wehe* (that is, greenish stone), which is the emerald. This is proved by the Imperial Dictionary in Four Languages, where this Chinese and Manchu term corresponds to Tibetan *mar-gad* (written also *ma-rgad*, Tāranātha 173, 19) and Mongol *markat*, both derived from Sanskrit *marakata* which itself is a loan word from Greek *zmaragdōs* or *maragdōs*.⁵ The Chinese word

¹ See ROCKHILL, *The Ethnology of Tibet*, p. 694.

² S. CHANDRA DAS, *Journey to Lhasa*, p. 183 (London, 1904).

³ An Account of an Embassy to the Court of the Teshoo Lama, in Tibet, p. 383 (London, 1800). On p. 261 he tells that he saw the rosaries owned by the deceased Pan ch'en rin-po-ch'e, made of pearls, emeralds, rubies, and sapphires; and on p. 336, he describes the necklace in the possession of a Lhasa lady of high rank, in which were employed balas rubies, lapis lazuli, amber, and coral in numerous wreaths, and in her hair she wore pearls, rubies, emeralds, and coral.

⁴ *Histoire de la ville de Khotan*, p. 168 (Paris, 1820).

⁵ A. WEBER, *Die Griechen in Indien (Sitzungsberichte der Berliner Akademie, 1890, p. 912)*. The oldest reference given in the Petersburg Sanskrit Dictionary as to the occurrence of the word *marakata* is the *Rājanighaṇṭu*. It is found, however, in the Sanskrit romances, for example, in the *Vāsavadattā* (edition and translation of L. H. GRAY, p. 109, *Col. Un. Indo-Iranian Series*, Vol. VIII, New York, 1913) of the seventh century. Also the Tibetan derivative *mar-gad*, appearing as equivalent of *marakata* in the Sanskrit Buddhist dictionary Mahāvīyutpatti (ed. of MINAYEV and MIRONOV, p. 77, St. Petersburg, 1911), allows us to infer that the Sanskrit word is older than the seventh century. It occurs likewise in Buddhahatṭa (L. FINOT, *Les lapidaires indiens*, p. XLIV) who probably wrote before the sixth century A. D. For the first part of the sixth century we have the testimony of Cosmas Indicopleustes (J. W. McCrindle, *Ancient India as described in Classical Literature*, p. 164, Westminster, 1901) who states that the White Huns living farther north than India highly prize the emerald, and wear it when set in a crown, for the Ethiopians, who traffic with the Blemmyes in Ethiopia, carry this same stone into India, and with the price they obtain make purchases of the most beautiful articles. The tradition of the *Agastimata*, as pointed out by FINOT (p. XLIV), seems to allude likewise to Egypt as to the derivation of the emerald. The Egyptian emerald has been studied by O. SCHNEIDER and A. ARZRUNI (*Zeitschrift für Ethnologie*, Vol. XXIV, 1892, pp. 41-100). The Greeks seem to have obtained their emeralds from Egypt; the Greek word is connected with Semitic *baraqt* or *bāreget* (DAREMBERG and SAGLIO, Vol. II, p. 1467, and O. SCHRADER, *Reallexikon*, p. 153), but possibly also with Egyptian *mafek-ma* or *mafek-en-mā* (R. LEPSIUS, *Les métaux dans les inscriptions égyptiennes*, p. 43, Paris, 1877). The reports of the Arabic geographers on the Egyptian emerald-mines are translated by WIEDEMANN (*Zur Mineralogie im Islam*, p. 239, Erlangen, 1912).

tsie-mu-lu seems to go back directly to the Persian word *zumurrud*,¹ and it seems quite plausible that the Chinese obtained emeralds in their considerable trade with Persia. Possibly the Chinese have made their first acquaintance with emeralds at the end of the Mongol period.²

Let us now revert to the history of the turquois in China. T'ao Tsung-i, the author of the interesting work *Cho keng lu* (first published in 1366) replete with valuable information concerning the Mongol period, has embodied in it a brief enumeration of the precious stones of the Mohammedans, which were traded to China in his time (Ch. 7, pp. 5 b-7 b, edition of 1469). The last group of these stones is designated *tien-tse* (GILES'S Dictionary, No. 11,180, but not noted with this meaning).³ Three kinds of these are distinguished: first, *Ni-she-pu-ti*, that is, stones from Nishāpūr in Persia, called the Mohammedan *tien-tse* whose veins are fine; secondly, *Ki-li-ma-ni*, that is, stones from Kermān in Persia, called *Ho-si tien-tse* (that is, *tien-tse* used in the country of

¹ HORN, Neupersische Schriftsprache, p. 6 (*Grundriss der iranischen Philologie* I, 2) and F. JUSTI, Kurdische Grammatik, p. XVI (St. Petersburg, 1880). In the Taoist novel *Fêng shên yen i* emeralds are mentioned as composing the umbrella of Virūpāksha. In W. GRUBE'S posthumous work (*Metamorphosen der Götter*, p. 512, Leiden, 1912) the name *tsu-mu-lu* has not been recognized as a foreign word and is literally translated from the meaning of the Chinese characters "Grandmother green," while the editor H. MUELLER in the index compiled by him (p. 651) explains it as "pearls"; also the variant *tsu-mu-pi* there employed means "emeralds." The same manner of writing the word (*tsu-mu-lu*) is employed also by Yang Shên (*Ko chi king yüan*, Ch. 33, p. 1) and by Ku Ying-t'ai in his *Po wu yao lan* (*ibid.*) written between 1621 and 1627. A curious error occurs in R. PUMPELLY, Geological Researches, p. 118 (*Smithsonian Contributions to Knowledge*, Vol. XV, Washington, 1867) who in a discussion of the mineral production of Yün-nan remarks: "Emeralds are very rare, and although the Chinese name is lieupaoshi [*i. e. lü pao shi*] (green precious stone), they are known among lapidaries as Sz'mulu, the name of Sumatra, whence they are probably obtained." The Chinese word in question is not a designation of Sumatra which was known to the Chinese under the names Shi-li-fo-shi and San-fo-ts'i (see HIRTH and ROCKHILL, *Chau Ju-kua*, p. 63), nor is emerald known to be found on Sumatra.

² BRETSCHNEIDER, *Mediæval Researches*, Vol. I, p. 174. But at an earlier date they heard of emeralds in the translations of Buddhist Sanskrit works. In one of the series of the so-called Seven Jewels (*saptaratna*) the emerald appears in the second place following the diamond, and is transcribed in the form *mo-lo-kiä-t'o* rendered into Chinese "green-colored bead" (*lü sê chu*) identical with *harinmani*, one of the Sanskrit synonyms of the emerald. Compare *Kiao ch'êng fa shu* (Ch. 7, p. 3, Hang-chou, 1878), a Buddhist dictionary of numerical categories written by Yüan Tsing in 1431 (WYLIE, *Notes*, p. 211).

³ In fact, none of our dictionaries contains the word *tien-tse* with the meaning of turquois, nor even does K'ang-hi's Dictionary. The origin and significance of the word is somewhat embarrassing, as it cannot be explained from any meaning assigned to the character *tien* (No. 11,180). In my opinion, a confusion of characters has been in operation in writing the word. It was intended for the character *tien* (No. 11,179) whose meaning is "to inlay objects with stones, inlaid or incrustated work." From this verbal noun, the new word *tien-tse* was derived with the sense "stones for inlaying," one of the main purposes for which turquoises are employed, and hence quite an appropriate designation. In the Ming period (*Ko ku yao lun* and *Pên ts'ao kang mu*, see below) we find a new mode of writing the word *tien-tse*, with the character *tien* (No. 11,199) meaning "indigo," which might have been prompted by an association of the color of the stone with that of indigo.

the Tangutans) whose veins are coarse; thirdly, stones of King-chou, called *tien-tse* of Siang-yang whose color is changeable. It is easy to see, and BRETSCHNEIDER¹ has already pointed it out, that the turquois of Nishāpūr and Kermān is understood here,² and it hence follows that *Siang-yang tien-tse* must have the meaning "turquois of Siang-yang." Siang-yang is a city and prefecture of Hu-pei Province, and King-chou is the name of an ancient province comprising parts of the present provinces of Hu-nan and Hu-pei. The changing of color, indeed, fits the turquois, since its blue shades often fade to a pale green on long exposure to the light.³ If this conclusion is correct, this would be the oldest Chinese reference to a turquois-producing locality in China proper in the latter part of the fourteenth century, and the first authentic use of a word for turquois in the Chinese language.⁴ It is interesting that Tu Wan in his *lapidarium* of 1133 (Ch. A, p. 11; see p. 23) devotes a notice to stones of Siang-yang employed for building purposes, but, has no allusion to turquois of this or any other locality. It is therefore obvious that, while quarries existed in that place during the Sung period, the turquois had then not yet made its appearance, and the fact is confirmed that the turquois mines were not operated before

¹ Mediaeval Researches, Vol. I, p. 175.

² See above pp. 40-42.

³ This peculiar property of the turquois is well known. Ibn al-Baitār says after al-Kindi who (according to WIEDEMANN, *Zur Alchemie bei den Arabern, Journal für praktische Chemie*, 1907, p. 73) died shortly after 870 A. D., that "the turquois changes its color on contact with an oily substance; also perspiration affects it [this is mentioned likewise by BOETIUS DE BOOT, *l. c.*, p. 269. and MAX BAUER, *Edelsteinkunde*, p. 488] and entirely deprives it of its color; contact with musk has a similar effect and destroys its value; Aristotle holds the opinion that a stone thus changing color has no value for its wearer" (L. LECLERC, *l. c.*, Vol. III, p. 51). In Pseudo-Aristotle (J. RUSKA, *l. c.*, p. 152) the purity of color in the stone is ascribed to the purity of the atmosphere which, when the latter becomes impure, causes the stone to become dim; when it comes in contact with molten gold, its beauty disappears. The latter clause is dubious. The sentence imputed to Aristotle is not traceable to him; neither Aristotle nor Theophrast make mention of the turquois. The alteration of color gave rise to the belief in the west that the stone foretold misfortune, or that the stone, when its owner sickens, will grow pale, and at his death lose color entirely. BEN JONSON (1574-1637), the dramatist, in his *Sejanus*, has the verse: "And true as Turkise in the deare lord's ring, Looke well or ill with him." FENTON (*Secret Wonders of Nature*, 1569) says: "The Turkeys doth move when there is any perill prepared to him that weareth it."

⁴ The quarrying of turquois in Hui-ch'uan, Yün-nan Province, mentioned for the year 1290 in the *Yüan shi* (see p. 26, Note 3) is, of course, older in fact. The *Chokeng lu*, however, is our starting-point in unraveling the mystery, as it affords the means of determining in an unobjectionable manner the significance of the word *tien-tse*. With this authentic evidence in our hands we can hope to attack successfully the passages in the *Yüan shi* where this word is employed, while it is not there explained. Besides, we have the important testimony of MARCO POLO, as pointed out before, which enables us to establish with certainty the fact that turquois was known and mined in China during the Mongol period. Marco Polo was familiar with the turquois, as shown by his remarks on the turquois-quarries in the province of Kermān in Persia, so that his turquois in the province of Caidu cannot be called into doubt.

the Mongol period. It is noteworthy, as we shall see hereafter, that at present turquoises are still mined in Hu-pei. If we now recall the account of Marco Polo (p. 16), it seems we are justified in saying that the Chinese became acquainted with the turquois not earlier than in the Yüan or Mongol period, that is to say, the thirteenth and fourteenth centuries. This early mining in Hu-pei cannot have been of great importance, as it is not alluded to in later sources. We further observe that the Persian turquois became known to the Chinese in the fourteenth century, and was considered as superior to the domestic stone.¹

This identification enables us to recognize the turquois also in the *Yüan shi*, the Chinese Annals of the Mongol Dynasty, where it is called *pi tien*, or *pi tien-tse*, "green or blue *tien*" (the word *tien* being identical with the above-mentioned word of the *Cho keng lu*). It entered the robe of the emperor and courtiers, and gold beads and turquoises are especially mentioned as used for earrings (*Yüan shi*, Ch. 78, p. 13 b). The Mongols were doubtless acquainted with the turquois long before their occupation of China, either through the Tibetans or Turkish tribes or through both. We know that among the antiquities of the bronze age of Siberia gold plaques incrustated with turquois and emeralds have been found² and, aside from Egypt, this ancient Siberian technique possibly represents the oldest employment of the turquois in the world. To the Chinese it was an alien substance which never became a national factor in their jewelry. They made its acquaintance through Turks, Persians, Tibetans, and Mongols, and I am under the impression that the Mongol rulers were the first to introduce it into China, and that their utilization of the stone gave impetus to the discovery of turquois mines on Chinese soil, and led to the turquois monopoly related by Marco Polo which has been mentioned above (p. 16) in the notes on Tibet. Also the reports of turquoises sent from the circuit of Hui-ch'uan in Yün-nan Province in the years 1284 and 1290 related in the *Yüan shi* (compare above p. 26, note 3) may be set in causal connection with the craving of the Mongol sovereigns for this stone.

At the rise of the Yüan Dynasty, the rule was established that products like gold, silver, pearls, jade, copper, iron, mercury, cinnabar, and

¹ At this point we should stop to reflect again whether, after all, the mining of turquois in Persia on an extensive scale is not earlier than the Mohammedan period. Compare above p. 40.

² KONDAKOFF, TOLSTOI and REINACH, *Antiquités de la Russie méridionale*, pp. 404, 405; S. REINACH, *La représentation du galop dans l'art ancien et moderne*, p. 66 (Paris, 1901). As far as I know, these turquoises have never been examined by a competent mineralogist, nor have they been traced to their place of origin. BAUER has nothing to say concerning the occurrence of turquois in Siberia. The *Armenian lapidarium* of the seventeenth century (translated by K. P. PATKANOV, *l. c.*, p. 48) gives Siberia as the fourth source for the turquois, and adds that this kind does not command any price.

turquoises offered to the throne by the inhabitants of the regions where the said products were found should be charged to the annual taxes due to them.¹ The localities for the production of turquoises, on this occasion, are given as Ho-lin and Hui-ch'uan. The former place is mentioned again under the Mongols in the year 1271 to the effect that a certain Umala collected turquoises (*pi tien-tse*) at Ho-lin.²

Ho-lin is the Chinese designation for Karakorum,³ the famous residence of the first successors to Chinggis Khan, Ogotai, Kuyuk and Mangu, and a large industrial and commercial centre in the Mongol period. It is not known whether turquoises occurred or are now found in the environments of that ancient capital; that is, in the basin of the Orkhon river, and it may very well be that Karakorum, during the thirteenth century, was merely a staple-place for them, whence they were traded to the Mongol and Tungusian tribes. In *Yüan-shi* (Ch. 94, § 2, p. 1) turquoises are enumerated among the natural products of the empire together with gold, silver, pearls, jade, copper, iron, mercury, vermilion, lead, tin, alum, saltpetre, and carbonate of natron.

It is thus evident that in the Mongol period at least three turquois-mines were in operation, in Hu-pei, Yün-nan, and Sze-ch'uan (Marco Polo's Caidu).

Also from Tibet turquoises were imported into China during that period. This may be inferred from a remark of Ts'ao Chao who published in 1387 the *Ko ku yao lun*, a collection of notes on art and antiquities. This was in the beginning of the Ming dynasty which rose in 1368, so that the author must have lived through the last years of the Yüan. He avails himself for the turquois of the peculiar Yüan expression *pi tien-tse*, but using a different character to write *tien*, identical with the word for 'indigo' (No. 11,199), so that the name would mean 'blue indigo sons.' He gives as localities for these stones the regions of the southern and western Tibetans (*Nan-fan*, *Si-fan*⁴) and describes them as of blue and green color, adding that good ones come somewhat near to the price of a horse, a statement evidently copied from the *Wu Tai shi* in regard to the *sê-sê* of the Tibetan women, referred to above.⁵ He further says that they are of the class of beads, and that

¹ *Kin-t'ing se wên hien t'ung k'ao*, Ch. 23, p. 3.

² *Ibid.*, p. 6 b. Hui-chou, as written in this work, is a mistake for Hui-ch'uan, as proved by the parallel passage in *Yüan shi*, Ch. 94, §2, pp. 1 b, 2 a.

³ BRETSCHNEIDER, *Mediæval Researches*, Vol. I, p. 122; Vol. II, p. 162.

⁴ From our standpoint eastern Tibetans; they border on the west of China and live partially on territory belonging to the political administration of China.

⁵ For the rest, this is merely phraseology which cannot be taken very seriously. In China as elsewhere stock-phrases are formed in the way of literary allusions and *bons mots* for stylistic purposes, and it would be preposterous to see in these a foundation of real fact. Thus the phrase, "bead or pearl of the value of a horse," is one of the

there are also those of black and green hues which are low in price. In another work of the Ming period, the *Po wu yao lan* (published between 1621 and 1627), the precious stones of Tibet are enumerated, the series being closed by a "blue precious stone, light-blue in color like the hue of the sky." As the word *pao shi*, 'precious stone' is used here, I am not certain whether the turquoise is meant.

In Chinese pottery occurs a deep-blue glaze well known to collectors under the name of turquoise glaze. It has sometimes been supposed that this glaze was intended to imitate the color of turquoise, as is, e. g., stated in the "Catalogue of the Morgan Collection of Chinese Porcelains."¹ This view, however, is erroneous; "turquoise glaze" is merely a designation of foreign origin, whereas, in the minds of the Chinese, the glaze has no relation to the turquoise. This glaze is produced by means of a silicate of copper known to the Chinese as *fei ts'ui* from its resemblance to the color of the plumes of the kingfisher, or as *k'ung-tsiö lü*, "peacock green."² This glaze appears for the first time in the pottery of the Sung period (960-1279)³ and was in full swing during the time of the Ming dynasty, being applied to porcelain as successfully as to faience. During these two periods, the turquoise was hardly known to the Chinese, or played no rôle in their life.⁴

The modern word *lü sung shi*, as far as I can see, does not occur earlier than the eighteenth century,⁵ and it may be presumed also that

school reminiscences reiterated by several authors. As early as in the *Lapidarium* of Tu Wan (*Yün lin shi p'u*, published in 1133) we find it stated (Ch. 2, p. 7) that on the waste land of the Temple of the White Horse (*Pai ma sze*) east of Ho-nan fu, after a heavy rain, fine stones of a deep purple and green color are found in the ground which belong "to the class of beads having the price of a Tibetan horse; others of these beads are light-green with many veins and speckles, and some are made into carvings of objects and images; deep-green ones are high in price." "These stones," concludes the author, "are produced in foreign countries, and are found also in the soil near the ancient capitals of Si-ngan fu and Lò-yang (Ho-nan)." If it were permissible to regard these stones as imported turquoises, additional negative evidence would be furnished that turquoise was not yet mined in China during the Sung period. Also Li Shi-chên (in his *Pên ts'ao kang mu*, Ch. 8, p. 17 b) uses the term 'bead of the value of a horse' (*ma kia chu*) as a designation for kingfisher-blue stones.

¹ Vol. II, p. 78 (New York, 1911).

² Compare S. W. BUSHELL, *Oriental Ceramic Art*, pp. 265, 315, 376 (New York, 1899).

³ LAUFER, *Chinese Pottery*, p. 316.

⁴ There is a popular tradition in Tibet in regard to blue-glazed Chinese faience tiles with which some temples are roofed that the first king Srong-btsan sgam-po of the seventh century had produced the glaze by melting an immense quantity of turquoise for the purpose (S. CHANDRA DAS, *Narrative of a Journey round Lake Yamdo*, p. 49, Calcutta, 1887).

⁵ It is certainly possible, as in the case of the word *pi-ya-se*, that also the word *lü sung shi* belonging to the colloquial language may be of earlier date than we at present suspect; but as the older sources regarding the every day language are very scarce, we can not yet offer any positive evidence.

the exploitation of turquoise mines in China was taken up again only at that time, while it was interrupted during the Ming period. In the records of the Ming and Ts'ing dynasties, there is no reference to quarrying turquoise. The great work on natural history of the sixteenth century, the *Pên ts'ao kang mu*, has nothing to say regarding this matter. In the K'ien-lung period (1736-95) turquoise was occasionally used in the imperial manufacture at Peking, as we may ascertain from several specimens in the Bishop collection in the Metropolitan Museum of New York. It contains, for instance, a scabbard of chased repoussé gold decorated with the eight Buddhist emblems (*pa pao*) carved in turquoise, apparently intended as a gift for some Mongol prince, and an imperial knife marked with K'ien-lung's seal, the handle being studded with lapis lazuli, carnelian and turquoise.¹

It appears that the Manchu emperors with their predilection for Lamaism and their interests in the Mongols and Tibetans derived the application of turquoise from these peoples, and followed in this respect the trail of the Mongol emperors. Among the Chinese these stones never became popular.² They were occasionally employed for inlaying, but then in connection with other stones to produce certain color effects. BUSHELL³ figures a box of carved red lacquer, decorated with floral designs, the fruit, flowers and other details inlaid in green and yellow jade, lapis lazuli, turquoise and amethystine quartz. In the Chinese collection in the Field Museum there is a pair of jade trees in pots of cloisonné enamel, the leaves of which are beautifully carved out of turquoise.⁴

It was for the first time also in the K'ien-lung period that the stone was officially adopted and its use sanctioned for the imperial cult.

Turquoises enter the imperial robe on some occasions, as recorded

¹ See BISHOP, *Investigations and Studies in Jade*, Vol. II, p. 244.

² This lack of popularity is best evidenced by the fact that the turquoise does not appear in the Chinese materia medica as it does in India and Tibet, nor are there any superstitious beliefs regarding it. This is remarkable considering among the Chinese the widest utilization for medicinal purposes of all substances occurring in the three kingdoms of nature.

³ *Chinese Art*, Vol. I, p. 133.

⁴ Figured in *Jade*, Plates LXVI and LXVII. The model of the Chinese jade trees presumably is to be looked for in the Bodhi trees of India made from precious stones and metals. The Great Chronicle of Ceylon (W. GEIGER, *The Mahāvamsa*, p. 203, London, 1912) from about the sixth century A. D. has this report: "In the midst of the relic-chamber the king placed a Bodhi tree made of jewels, splendid in every way. It had a stem eighteen cubits high and five branches; the root, made of coral, rested on sapphire. The stem made of perfectly pure silver was adorned with leaves made of gems, had withered leaves and fruits of gold and young shoots made of coral. The eight auspicious figures [these are, lion, bull, elephant, water-pitcher, fan, standard, conch-shell, lamp] were on the stem and festoons of flowers and beautiful rows of four-footed beasts and rows of geese." Then follows a description of the canopy consisting of pearls and precious stones.

in the "Institutes of the Manchu Dynasty" (*Ta Ts'ing hui tien t'u*, Ch. 42). When the emperor officiates in the Temple of Heaven (*T'ien t'an*), he wears a rosary of lapis lazuli beads; in the Temple of Earth (*Ti t'an*), one of amber beads, yellow being the color of Earth; in the Temple of the Sun (*Ji t'an*), one of corals; and in the Temple of the Moon (*Yue t'an*) one of turquoises (*lü sung shi*); while the girdle for the service in the latter temple is set with white jade.¹ The ordinary imperial court-girdle consists of yellow silk and is adorned with rubies or sapphires and turquoises. Also in the State Handbook of the Manchu Dynasty (*Huang ch'ao li k'i t'u shi*) turquoises are repeatedly mentioned as entering imperial helmets and sword-sheaths, also as employed for the jewelry of the empress and the court-ladies. They usually were combined with river pearls, corals, and lapis lazuli.²

¹ Color symbolism is an ancient and conspicuous feature of Chinese rites, and was originally associated with the four quarters and the cosmic deities who were linked with the latter (compare *Jade*, p. 120); at a later time it was affiliated also with the five elements and other categories of five (a comparative table of these associations is given by A. FORKE, *Lun-hêng*, Vol. II, p. 440). The Chinese system has already been compared with those found in North America and Mexico by Mrs. ZELIA NUTTALL, *The Fundamental Principles of Old and New World Civilizations* (*Arch. and Ethn. Papers, Peabody Museum*, Vol. II, Cambridge, Mass., 1901, pp. 286, 293), with the result that, "whilst the fundamental principle of the system was identical, the mode of carrying it out was different in China and America, a fact which indicates independence and isolation at the period when elements and colors, etc., were chosen and assigned to the directions in space." The whole problem, of course, is not historical but purely psychological.—In the imperial worship of the Manchu dynasty, as shown above, color symbolism was still fully alive. In the Temple of Heaven covered with blue-glazed faience tiles, everything was blue during the ceremonies, the sacrificial utensils being of blue porcelain, the participants in the rites being robed in blue brocades, and Venetian shades made of thin rods of blue glass were hung over the windows, in order to lend also to the atmosphere a tinge of blue. At the Temple of Earth, all was yellow; at the Temple of the Sun, red; and at the Temple of the Moon, everything was brilliant with a moonlight white.

² In the Sungari River, a light-green stone of unctuous appearance is found which is utilized for the making of ink-slabs. It is called in Chinese *sung hua yü, li*, pine-tree flower jade, but it has nothing to do with turquois nor with jade. The Manchu name Sungari means in the Manchu language the Milky Way, and is popularly called in Chinese, with reference to the Manchu sounds, *Sung hua kiang*, "Pine-tree Flower River," while the designations of the Chinese written language are Hun-t'ung Kiang or Hei Shui ("Black Water"). The meaning of the stone *sung hua yü*, accordingly, is "precious stone of the Sungari River." Compare *Man-chou yüan liu k'ao*, Ch. 19, pp. 1-2 (a work on the History of the Manchu published in 1777). When the records of the Manchu dynasty mention turquois in combination with pearls, this is not a contradiction to what has been stated above regarding this point (p. 31). The pearls of the imperial house were cheap river pearls known as eastern pearls (*tung chu*), a product of Manchuria. They were fished in the Sungari and its side-rivers, and are described as brilliant-white nearly half an inch (Chinese) big, even the smallest of the size of the seed of a soy-bean. They were chiefly utilized on the crowns of the caps of royal princes, their number marking differences of rank (*Man-chou yüan liu k'ao*, Ch. 19, p. 1). The shell yielding this pearl has been identified with *Anodonta plicata* Sol. (compare GRUM-GRZHIMAILO, *Description of the Amur Province*, in Russian, p. 358, St. Petersburg, 1894, where some information regarding the pearl industry of the Amur region is given).—The word for lapis lazuli in the State Handbook is *ts'ing kin shi* (see p. 44). Beads made from this stone were chiefly employed for ornaments of the empress and court-ladies, likewise for the adornment of ceremonial head-dresses.

At the present time there are two distributing centers in China for the trade in turquoises,— Peking commanding the market of Mongolia, and Si-ngan fu controlling the trade with Tibet. In Si-ngan fu there may be a dozen traders engaged in the business. They are all settled in the same street and work up the raw material in their own shops. They produce beads and flat stones (Plate VI, Fig. 1) in any desired dimensions, by grinding and polishing, and drill perforations through them. The latter is an essential operation as Tibetans are averse to accept any others (except the small beads to be set in rings or the plaques for inlaying earrings and charm boxes). The first experiment that a Tibetan will make with a turquoise offered is to ascertain the quality of the perforation by blowing or spitting through it, or by boring it with a needle. If the experiment is unsuccessful, he will return it at once. At Si-ngan the stones are sold by weight, prices ranging according to quality from 5–8 Taels (about \$3.50 to \$5.60) a catty ($1\frac{1}{2}$ pounds). Exceptionally beautiful stones or very small and carefully polished beads are sold as individual items only. Beads and stones are purchased there by Chinese commercial travelers trading with Tibetans and employed by them as a means of barter. Their example was duly adopted, and a great many specimens were secured by me in Tibet in exchange for turquoises.

Of worked articles of the Chinese the quadrangular, flat stones (Plate VI, Fig. 1) and the large beads for use in rosaries come first. Then there are fanciful carvings formed into the appearance of rocks (Plate VI, Figs. 2–4) or birds (Plate VII, Fig. 1) destined to adorn the table of a Lama and to serve as paper-weights; further, figures of animals like that of a tiger or a fish to be suspended as ornaments from a girdle (Plate VII, Figs. 3 and 4); snuff bottles (Fig. 2) skilfully hollowed out, and buttons (Fig. 5) with double edge cut into the petals of a flower to be sewed on to a cap, or a fillet worn by women. The image of carved turquoise on Plate VII, Fig. 6, represents the Dhyānibuddha Amitābha, made in Peking. The twelve animals of the solar zodiac (Plate VIII) constituting a cycle of twelve years, each year being named for one animal, are each carved from turquoise, of Peking workmanship; they represent rat, ox, tiger, hare, dragon, serpent, horse, sheep, monkey, cock, dog, pig or boar. Such sets are made for wealthy Mongols to facilitate the counting of years.¹

¹ The carving of such sets is not a modern idea. It was practised as early as the T'ang period when marble was listed for this purpose. A complete set of the animals does not seem to have survived from that epoch, at least none has come to my notice; but a certain number of single animals belonging to different sets, obtained by me in Si-ngan fu, is in the collections of the Field Museum. A curious set carved from nephrite is in the Bishop collection in New York (see BISHOP, *Investigations and Studies in Jade*, Vol. II, p. 241, No. 730); the representatives of the zodiac have hu-

The Hon. W. W. ROCKHILL,¹ who passed through Si-ngan in 1889, was given the information that turquoise is found in Ho-nan. There is no reason to doubt the correctness of this statement for the mere reason that it was not confirmed to me in 1909; for even in China considerable changes are bound to come about within a period of twenty years, and I am inclined to think that it is quite possible that the mines of Ho-nan have since been exhausted.

man bodies but animal heads, they are clothed in costume of Chinese style and hold objects as attributes in their hands. This iconographic composition is also traceable to the T'ang period, as may be evidenced by a tombstone in the collections of the Field Museum; this contains an epitaph (*mu chi*) yielding the date 861 A. D. The twelve animals of the cycle are here arranged in four groups corresponding to the four cardinal points, a group of three facing one of the sides of the quadrangular stone slab, in the same manner as in the one published by M. CHAVANNES (*T'oung Pao*, 1909, p. 74) from a Chinese rubbing. While, however, the illustration of M. Chavannes shows figures of men, that is, Chinese officials in official costume, holding in their arms the respective animal, there are engraved on our tombstone figures of men with human bodies clad in official robes and holding jade insignia of rank in their hands, but each having the head of the particular animal. This is the same principle as in the set of the Bishop collection in which each piece is an independent all-round carving. In the rubbing of M. Chavannes the idea is brought out of the officials presiding over the twelve animals, whilst in the two other series the animals are themselves conceived as officials. The same ideas are expressed in the iconography of the gods of the Twenty-eight Lunar Mansions, which will shortly give me occasion for some remarks with reference to a group of masks in our collection representing this series of deities. It is known that the origin and diffusion of this solar zodiac based on a division into twelve parts of the celestial or ecliptic equator has given rise to many discussions and theories. I was formerly inclined (*T'oung Pao*, 1907, p. 400, and 1909, p. 71) to accept the theory of CHAVANNES (*ibid.*, 1906, pp. 51-122) according to which the cycle of the twelve animals would have originated among Turkish tribes who transmitted it to the Chinese. Having meanwhile studied the work of FRANZ BOLL, "Sphæra" (Leipzig, 1903), and the same author's recent paper, *Der ostasiatische Tierzyklus im Hellenismus* (*T'oung Pao*, 1912, pp. 699-718), I hold that his arguments in favor of an origin of the cycle within the sphere of Egyptian Hellenism are, in general, convincing to a certain extent, though much would remain to be done in detail to prove the migration of the system from this centre to the Turks and to China. There is, however, an objection to be made to the first piece of evidence offered by BOLL on behalf of the dependence of the Chinese cycle (p. 705): "In the Chinese list sacred Egyptian animals have survived, particularly the monkey which does not occur on the cold plateau of Central Asia." This is merely an old European fable which seems to be inexterminable, and which has already been refuted by me in *T'oung Pao*, 1901, p. 28; it would mean to shoot sparrows with cannon to march up here the whole evidence known to every zoölogist, to the effect that monkeys are propagated from the Himalaya through Tibet into the mountains of Yün-nan, Sze-ch'uan and Kukuñr region, and throughout central and southern China. Chinese, Tibetan, and all other Indo-Chinese languages possess ancient indigenous words for several species of monkeys, and at the time when the cycle was received by the Chinese, the monkey was very familiar to them and frequently represented in art. Another more serious objection to be advanced to the essay of Boll is that he has paid no attention to the arguments which induced L. DE SAUSSURE (*T'oung Pao*, 1910, pp. 583-648) and A. FORKE (*Lun-hêng*, Vol. II, pp. 479-494; compare also the additional remarks of P. PELLIOU, *Journal asiatique*, 1912, *Juillet-Août*, p. 163) to defend the indigenous origin of the cycle in China. The Chinese tradition entirely unheeded by Boll can not be so easily run down, and though he has stated the case clearly on its historical side, there remains to be solved the psychological part of the problem which has not yet been touched upon.

¹ The Land of the Lamas, p. 24 (London, 1891).

BRETSCHNEIDER¹ quotes PUMPELLY. (Geological Researches in China, Mongolia, Japan, p. 118) as mentioning the existence of *sung ur shi*, a mineral similar to turquoise, in the province of Yün-nan; but this statement requires confirmation, as it is not found in other sources relating to Yün-nan (compare above p. 26, note 3).²

From one of the turquoise dealers in Si-ngan fu the information was given me that the turquoises traded there come from the prefecture of Yün-yang in Hu-pei Province, while another more especially pointed to the district of Chu-shan, situated in the same prefecture, as the place of production. The Imperial Geography (*Ta Ts'ing i t'ung chi*, Ch. 272),³ in the chapter dealing with Yün-yang fu, contains no allusion to this fact, and mentions in an enumeration of the mountains of the Chu-shan district only one producing stones, the *Fan shi shan*, deriving its name from the *fan shi* or alum formerly produced there. It should be borne in mind that the Imperial Geography, as far as products are involved, does not reflect the present conditions of China based on actual research, but merely gives occasional quotations from older literature going back as far as the T'ang dynasty, so that this feature of the Geography is very incomplete and unsatisfactory. The products of Yün-yang fu, for instance, are all cited from the Geography of the Ming Dynasty (*Ta Ming i t'ung chi*). It is very probable that the turquoise production of Yün-yang fu is of recent date, and presumably posterior to the publication of the Geography; it seems to me that the exhaustion of the turquoise mines in Ho-nan may have given the impetus to a search for a new locality in Hu-pei. It would be gratifying if these lines would

¹ Mediaeval Researches, Vol. I, p. 176.

² The work of R. PUMPELLY is published in *Smithsonian Contributions to Knowledge*, Vol. XV, Article IV, Washington, 1867. I do not understand Pumpelly with Bretschneider as saying that "a mineral similar to turquoise" is actually found in Yün-nan. Pumpelly enumerates it in a series of eight other stones of which he says that "they are carved, with great labor and patience, in very intricate forms." He does not point out any locality in Yün-nan, where turquoise is obtained, but merely intends to say that he has seen in Yün-nan carvings made from this material which, judging from the Chinese name given by him, doubtless was turquoise. But this turquoise may have been imported into Yün-nan as well. G. SOULIÉ (La province du Yün-nan, p. 24, Hanoi, 1908) only states: "The south-western part of the province furnishes a certain quantity of precious stones amassed in the beds of torrents or rivers; the west and south-west of the province are renowned for their amethysts, sapphires and rubies."

³ First printed in 1745, second edition 1764. The modern Shanghai photolithographic reprint is a poor production. The Palace editions of this work are now exceedingly scarce. When at Si-ngan fu in 1902, an official there informed me that the late Empress Dowager, while living as an exile in that city in 1900, was anxious to obtain a copy for personal reading and wired to all Governors General making a requisition for it, but was unable to procure it. Eight years later fate treated me more kindly than the Empress by permitting me to see the *editio princeps* in the hands of a Peking bookseller, but lack of cash (the price demanded was 400 Mexican Dollars) unfortunately barred me from the privilege of acquiring it.

cause a mineralogist or geologist to pay a visit to those Chinese turquoise mines, and to give us information on their extent, the working methods employed, and the magnitude of the output and trade in the material.

In Japan the turquoise does not occur, and it has been unknown to the Japanese. The Japanese mineralogists, on becoming acquainted with it through our literature, coined the artificial word *turkodama*.

ADDITIONAL NOTES

pp. 1-4. The date of the introduction of the turquoise into India may be somewhat more exactly defined by referring to the negative evidence presented by the great Sanskrit-Buddhist dictionary, the *Mahāvīyutpatti* (TH. ZACHARIAE, *Die indischen Wörterbücher*, p. 39) the Sanskrit text of which, accompanied by a Tibetan translation, is printed in the Tibetan Tanjur (*Sūtra*, Vol. 123). In Ch. 235 (ed. of MINAYEV and MIRONOV, p. 77, St. Petersburg, 1911) giving the names of precious stones, the word for turquoise, *peroja*, is not included, quite in accordance with the fact that the turquoise is not spoken of in Buddhist literature. We are therefore justified in concluding that at the time when Buddhism was introduced from India into Tibet, in the seventh and eighth centuries, the stone was not yet known in India, whereas at the same time it was widely known and appreciated in Tibet; thus, Tibetan knowledge of the turquoise is not due to an impetus received from India. The Sanskrit-Tibetan equation, *peroja* = *gyu*, which we might expect does not exist in lexicographical literature. The earliest historical testimony for turquoise in India, as shown above p. 3, remains that of al-Bērūnī in the post-Buddhistic or Mohammedan period, and even at his time the turquoise cannot have been very generally diffused over India, as at that time it had not yet entered the horizon of the Indian mineralogists.

p. 1. The Persian word *ferozah* or *firozah* (*firūza*) for the turquoise means "victorious," and is derived from the word *feroz* or *firoz*, "victory, victorious, successful" (see, for example, JOHNSON and RICHARDSON'S *Persian-English Dictionary*, ed. by STEINGASS, p. 944). Also the Arabic mineralogist al-Akfānī explains the Persian name of the turquoise as signifying "victory"; hence, he says, it is called also "stone of victory" (WIEDEMANN, *Zur Mineralogie im Islam*, p. 225); likewise, al-Ta'alibī (*ibid.*, p. 242) has an allusion to this effect. A similar notion seems to be underlying the first of five turquoise varieties established by the Lama Klong-rdol (CHANDRA DAS, *Tibetan-English Dictionary*, p. 1152), called *zül-gnon gyu spyang*, in which term the first element has the significance "overcoming, vanquishing."

p. 3, note 1. It should not be understood that Dioscorides had any knowledge of turquoise; he does not mention it (in the same manner as his contemporary Pliny) nor does he have any name that could be interpreted as such. In Ch. 157 of his *Materia Medica* he speaks of the sapphire (*sappheiros*), *i.e.*, lapis lazuli, and says that those bitten by a scorpion will be relieved by taking this stone as a potion (compare F. DE MÉLY, *Les lapidaires grecs*. Translation, p. 24, Paris, 1902). It is only in the mediaeval work of Ibn al-Baitār, the Arabic version of Dioscorides, that the same notion is transferred to the turquoise.

p. 14, note 1. The statement that Li Shi belongs to the T'ang period is based on the fact that in the editions of the *Sū po wu chi* he is assigned to the T'ang. This, however, seems to be a mere traditional opinion, while in fact the work is said to date from the Sung period (PELLIOT, *Journal asiatique*, *Juillet-Août*, 1912, p. 155).

p. 21. M. PELLIOT, who showed me the favor of looking over the galley-proofs of this paper, kindly calls my attention to another interesting text mentioning a fossil tree. This is the *Tu yang tsa pien* (Ch. C, p. 1, edition of *Pai hai*) written by Su Ngo

in the latter part of the ninth century (WYLIE, Notes, p. 194). Under the year 841 A. D. mention is made of a tribute sent to Emperor Wu-tsung (841-846) of the T'ang dynasty by the country of Fu-yü. The latter were a tribe, presumably belonging to the Koreans, residing in Liao-tung and in the valley of the Sungari, and are first mentioned in the Annals of the Later Han Dynasty (Ch. 115, p. 2). Their tribute consisted of two objects, three pecks of obsidian (*huo yü*, lit. fire jade, that is, stone of volcanic origin; compare the discussion on obsidian at the end of these notes) and a petrified fir-tree (*sung fêng shi*, lit. fir-tree wind stone) measuring ten (Chinese) feet all round and lustrous like jade. Inside of the stone substance the outlines of a tree were visible. As an old fir-tree bends from the action of the wind, so a cold blast came from the branches of that petrified tree. In the midst of the summer, the emperor ordered the tree to be placed in the rooms of the palace; gradually there arose the sound of the whizzing of the autumn breeze; when the rooms were cooled off, he had the tree brought out again.

p. 23, note 2. According to a communication of M. PELLIOU, the collected works of the poet Lu Kuei-mêng have been published under the title *Li* (No. 6957) *tsê* (No. 11,666) *ts'ung shu* (4 chapters and an appendix), of which there are several modern editions. I find a biographical sketch of his embodied in the *Pei mêng so yen* (WYLIE, Notes, p. 194), Ch. 6, p. 10b (edition of *Pai hai*).

p. 25. The first European author who treated of *sê-sê* was A. PFIZMAIER (Beitrag zur Geschichte der Edelsteine und des Goldes, *Sitzungsberichte der Wiener Akademie*, 1868, p. 210) in translating the two texts relative to the stone in the *Ming huang tsa lu*. He did not explain it, though he was always ready to translate Chinese names, even those being transcriptions of foreign words which are not capable of a literal interpretation.

p. 25, note. M. PELLIOU thinks that the source for the definition of Palladius is K'ang-hi's Dictionary *sub voce sê* (No. 9600) where after the *Yün hui* of the thirteenth century *sê-sê* is defined as a *pi chu*, while the foundation for Couvreur's statement is the commentary to the *Shi king* (K'ang-hi, *sub voce sê*, No. 9599); this, however, refers only to the single word *sê*, not to the later compound *sê-sê* which, as pointed out on p. 47, is the Chinese transcription of a foreign word. No conclusions, accordingly, can be built on the definitions of Palladius and Couvreur in regard to the nature of *sê-sê*.

p. 26, note 3. M. PELLIOU remarks that the text of the *Nan-chao ye shi* is derived from the older work *Man shu* of the T'ang period where the passage relative to *sê-sê* occurs in Ch. 10, p. 48. The *Man shu* is the work of Fan Ch'o and was published about 860; the history of the work is given by PELLIOU (*Bulletin de l'Ecole française d'Extrême-Orient*, Vol. IV, 1904, p. 132).

p. 33. The word *sê-sê* occurs several times in the *Tu yang tsa pien*. In Ch. A, p. 3 (edition of *Pai hai*), its author, Su Ngo, speaks of a peculiar kind of silk threads sent as tribute in 765 A. D. by the country Mi-lo in the Eastern Sea. These threads, of great strength, were knitted into a kind of bag or sheath which on both sides was perfectly translucent like strung *sê-sê*. It follows from this important passage that the *sê-sê* were bright and lustrous stones, and therefore cannot denote the turquoise which is dense and non-transparent. Further (Ch. A, p. 8), there is described a marvelous screen which originally belonged to Yang Kuo-chung, a cousin of Yang Kuei-fei (above, p. 33), who died in 756 (GILES, Biographical Dictionary, p. 909). On this screen the figures of the beauties and hetairas of the times of antiquity were engraved, and it was framed with tortoise-shell and rhinoceros-horn. A fringe was suspended from the lower edge and formed by genuine pearls and *sê-sê*,—the whole of such ingenious workmanship that one could hardly believe it was produced by a human hand. A screen having the color of *sê-sê*, thirty feet wide and a hundred feet long, is mentioned (Ch. c, p. 9 b) as having been in the possession of Princess T'ung-ch'ang, curtains and screens made from gold, silver, and *sê-sê* (*ibid.*, p. 12 b); Buddhist pennants or streamers composed of coral, agate, genuine pearls and *sê-sê* (*ibid.*, p. 14 b) to be used in a procession when some sacred bones of Buddha were sent

from the temple Fa-mên in Fêng-siang to the capital Si-ngan fu to be shown in the palace and in the monasteries of the city (compare *Kiu T'ang shu*, Ch. 15 A and DE GROOT, *Album Kern*, p. 135). These five passages relate to the age of the T'ang dynasty and show that *sê-sê*, as then employed in China, were precious stones of transparent quality, on a par with genuine pearls and precious metals; they further bear out the fact that *sê-sê* were jewels not bigger than a pearl, otherwise they could not have been strung together with pearls. All this renders the assumption of *sê-sê* being the turquois impossible and confirms my opinion that it was the balas ruby. We insisted above on the popularity of the word *sê-sê* in the T'ang period. This is fully corroborated by the interesting work *Tu yang isa pien* where it enters into comparisons from which it becomes clear that the word was very familiar and generally understood at that time. In Ch. c, p. 5 are described three marvelous plants which, when eaten, guard man from old age. The first of these is called *shuang lin chi*, "the agaric with the double *lin* (female unicorn)," and is described as a plant with one stalk and two flowers so hidden away that they are scarcely visible, and shaped like a *lin* with head and tail, all complete; and they produce seeds like *sê-sê*.

p. 36, note 1. Turquois-mines in the district of Upper Nasiyā in Ferghana are mentioned by Ibn Haukal (978 A. D., ed. of DE GOEJE, *Bibl. Geogr. Arab.*, p. 397), as Mr. GUY LE STRANGE, the excellent Persian scholar of Cambridge, England, has been good enough to write me. M. PELLIOU refers, as regards turquois-mines of Khojend, to PAVET DE COURTEILLE, Baber nameh, Vol. I, p. 7. This work is not accessible to me, but I find in the new English translation of A. S. BEVERIDGE (*The Memoirs of Baber*, p. 8) the passage as follows: "To the north of both the town [Khojend] and the river lies a mountain range called Munūghul; people say there are turquois and other mines in it, and there are many snakes." There is, accordingly, no longer any reason to doubt the indigenous occurrence of turquois in the territory of Ferghana, and it will be correct to assume that it was mined there from the latter part of the tenth century.

p. 40. Mr. GUY LE STRANGE has been good enough to refer me to the fact that the text of the passage of Ibn Haukal (Hauqal or Hawqal, as others spell it), the continuer or re-editor of Ishākhri, is found in DE GOEJE's *Bibl. Geogr. Arab.*, p. 313; the turquois mines, according to him, were near Nūqan, which is Tus to the north of modern Meshed. On p. 362 of the same work, celebrated turquois mines are mentioned in Transoxania near the mountains called Jabal-Buttam.

p. 43, note 2. In regard to the *uk-nu* stone mentioned in the Assyrian inscriptions Mr. PINCHES has shown that it denotes lapis lazuli from the Zagros range (*Journal Royal Asiatic Society*, 1898, p. 259, note 1). I have no judgment on this point.

p. 44, note 2, and p. 62. It is assumed by several authors that lapis lazuli is found in China. A. WILLIAMSON, who has written an interesting article on the productions of northern China (*Journal China Branch R. As. Soc.*, Vol. IV, 1868, p. 41), asserts on hearsay reports that in Shan-si, and among the hills in the south of Shen-si, precious stones, such as lapis lazuli, ruby, etc., abound, and that he has every reason to believe the report correct. F. PORTER SMITH (*Contributions towards the Materia Medica and Natural History of China*, p. 129, Shanghai, 1871) who takes the word *liu-li* in the sense of lapis lazuli says that the blue mineral known by this name is met with in very fine specimens in China and Central Asia. In the "Catalogue spécial des objets exposés dans la section chinoise à l'exposition de Hanoi, 1902" (p. 121) mention is made of the lapis lazuli of the Island of Hainan. In the latter case it is more than probable that the determination is wrong and merely due to a confusion with cobalt which, as well known, is obtained on Hainan (HIRTH, *Chinesische Studien*, p. 251). According to R. PUMPELLY (*Geological Researches*, p. 117, *Smithsonian Contributions to Knowledge*, Vol. XV, Washington, 1867) lapis lazuli is found at Mount Nien in the district of Ch'ang-shan, prefecture of K'ü-chou, Ché-kiang Province, and in the district of Lo-ts'ing, prefecture of Wên-chou, of the same province. These statements, however, as the entire list of minerals in which they are contained, are based on the *Ta Ts'ing i l'ung chi* and other Chinese sources examined by "the author's Chinese secretary" (p. 109). But I am at a loss to explain where

the Chinese secretary found these statements. There is nothing to this effect to be met in the *Ta Ts'ing i t'ung chi*. Among the products of K'ü-chou fu (Ch. 233, p. 9) are mentioned, after the *Ta Ming i t'ung chi*, ink-slabs produced in the two districts of Ch'ang-shan and K'ai-hua, but no other kind of mineral; in the account of Wên-chou fu (Ch. 235, p. 10) no stone is registered. Perhaps his statement is derived from his "other Chinese sources"; but even then we should like to know the Chinese word translated by him "lapis lazuli," and as he does not give it, his note is rather valueless. As pointed out on p. 44, note 2, we meet in the *Ta Ts'ing i t'ung chi* the word *kin sing shi* (lit. gold star stone) in Ch. 398, p. 3 b, description of Sze-chou fu in Kuei-chou Province, where it is said that this stone occurs east of the city of Sze-chou in the Kia-ch'i Lake, and that, according to the Provincial Gazetteer, stars and spots appear on its surface, that it is hard and glossy and can be worked up into ink-slabs. GILES (in his Dictionary, p. 252c) explains *kin sing shi* by "iron and copper pyrites," in agreement with F. PORTER SMITH (Contributions towards the Materia Medica and Natural History of China, p. 123, Shanghai, 1871). I do not wish to push this discussion any further, as the second word cannot be spoken before the first has been said. Specimens suspected of being lapis lazuli must be procured from the various localities where they are reported to occur, and examined by competent mineralogists. Others like T. WADA (*Beiträge zur Mineralogie von Japan*, No. 1, p. 21) deny that lapis lazuli is found in China, and are of the opinion that it is imported from Central Asia.

p. 45. Incidentally I wish to refer here to a now antiquated investigation of T. DE LACOPERIE, On Yakut Precious Stones from Oman to North China, 400 B. C. (*Babylonian and Oriental Record*, Vol. VI, 1893, pp. 271-4), in which the Chinese *ye kuang chu*, "the bead or pearl shining at night," is set in relation with the Arabic word for the ruby *yakut* (an etymology impossible for philological and historical reasons; in fact, the Chinese term is not a transcription of any foreign word but a thoroughly Chinese formation) and identified with the ruby, "probably from Badakshan, the chief source of these stones at that time."

p. 46, note I. The date of Yang Shên, as given by MAYERS, is correct; it is given as the same by CHAVANNES (*T'oung Pao*, 1904, p. 474) who notes his biography after *Ming shi* (Ch. 192). Yang Shên wrote the *Nan-chao ye shi* in 1550.

p. 49. For the elucidation of this text I am greatly indebted to M. PELLIOU who will himself take it up in his proposed study of the history of the Nestorians in China. M. PELLIOU says that he has not found the text in the *Hua yang kuo chi*, but on the other hand has not succeeded in discovering a trace of an independent work *Hua yang ki*. The quotation given from Chao Pien is not contained in the latter work, but is taken from another source. According to the *Sung shi*, Chao Pien lived in fact from 1006-1084, as will be demonstrated by M. PELLIOU in the publication mentioned, but it is not certain whether he is the author of the *Shu tu ku shi*. What is rendered above by monolith is in the text *shi sun* (Nos. 9964, 10438) by which M. PELLIOU is inclined to understand megalithic monuments. These stone ruins are the remainders of an ancient tomb (compare *Ch'êng-tu hien chi*, 1873, Ch. 2, p. 3 b, and *Sze-ch'uan t'ung chi*, Ch. 48, p. 66 b), and have nothing to do with the Temple of Ta Ts'in. In the last number of the *Journal asiatique* (*Mars-Avril*, 1913, p. 308), CHAVANNES and PELLIOU alluding to the text of *Neng kai chai man lu* incline toward the opinion that the temples of Ta Ts'in are due to the Nestorians.

p. 52. Also Qazwîni (1203-83) mentions the onyx of China (Sîn) with the curious addition that the people of Sîn repudiate the quarrying of the onyx mines, which is left only to slaves who cannot otherwise eke out a living and sell the stone in countries outside of Sîn (J. RUSKA, *Das Steinbuch aus der Kosmographie des al-Qazwîni*, p. 12).

p. 53, note 3. The statement that the *Shi si yü ki* seems to be lost is based on BRETSCHNEIDER's authority; besides the quotation as given there, his Mediæval Researches (Vol. II, p. 268) ought to have been pointed out, where the same is repeated. But this is contradictory to what Bretschneider says on p. 147 of the same

volume that the book in question seems to be still extant and is noticed in the Imperial Catalogue (Ch. 64, p. 5). Also M. PELLIOI thinks that the work is extant, but there are no modern editions of it.

p. 55, note 5. As the emerald is not made mention of in the Bower Manuscript of about 450 A. D., it would be justifiable to conclude that, taking the positive testimonies into consideration, the emerald was introduced into India not earlier than the beginning of the sixth century A. D. The passage of Cosmas regarding the emerald will be found on p. 371 of MAC CRINDLE's translation (Christian Topography, ed. of *Hakluyt Society*, London, 1897).

p. 56, note 3. T. WATTERS (Essays on the Chinese Language, p. 352) believed he recognized the Persian word *firūza* in Chinese *pi-liu* (Nos. 9009 and 7245) or *pi-liu shi* (stone) to which he ascribes the meaning of turquoise (observation of M. PELLIOI). But the source from which the Chinese word is derived is not given.

The discourse on *sê-sê* has furnished sufficient proof for the fact that the Chinese designation of a stone may refer to different species according to different localities, and that the significance of such a word may undergo changes in course of time. Moreover, we observe that the name of a stone used with reference to a foreign country does not necessarily denote the same species as the same name when applied to the domestic variety. An interesting case of a similar bearing is presented by the account on Japan in the Annals of the Later Han Dynasty (*Hou Han shu*, Ch. 115, p. 5 b) where white pearls (*pai chu*) and (what from a Chinese point of view would be a literal translation of the term) "green jade" (*Ts'ing yü*) are mentioned as products of Japan; indeed, the term has thus been translated, for instance, by E. H. PARKER (*China Review*, Vol. XVIII, p. 219 a). But it is evident that this translation cannot be correct, for we know surely enough that Japan does not produce jade (see *Jade*, pp. 351-4). It is therefore manifest that the word *ts'ing yü* in the above text relates not to any kind of jade but to a Japanese stone, and that the term must be taken from a Japanese, not a Chinese viewpoint, and it may be inferred also that it must designate a mineral peculiar to Japan and absent in China. The Chinese character *yü* is read in Japanese *tama*, and this Japanese word signifies any gem or precious stone in general, or even more commonly a bead or ball of any stone. The color name *ts'ing* (Japanese *aoi*, Sinico-Japanese *sei*) is of uncertain quality and refers to the general color prevalent in nature, green, blue, black, gray, usually meaning any dark neutral tint. Such a substance playing a large rôle in the antiquity of the Japanese and the Ainu is obsidian. It is unknown in China, but found in several localities of Japan (Bungo, Izu, Kai, Shinano, Tokachi: N. G. MUNRO, Prehistoric Japan, p. 292, Yokohama, 1908). It was largely utilized, as in ancient Mexico, for the manufacture of arrowheads, and abundant flakes scattered around in the sites mentioned testify to its popularity. As elsewhere, it was worked up also into beads and balls to enter into personal adornment.

P. F. v. SIEBOLD (Geogr. and Ethnogr. Elucidations to the Discoveries of M. G. Vries, p. 175, Amsterdam, 1859) reports on obsidian balls received from Yezo, "from two feet to two feet and a half in diameter, coal-black of color, and some small blue pieces of stone, of which probably the so-called *Krafto* (properly *Karafuto*) *tama*, or precious stone of *Krafto* is formed." It could appear from this statement that obsidian and the blue *Karafuto tama* are considered by Siebold as different stones; but, in another passage of the same book (p. 105), he comments on a blue bead chain noticed by Vries in the ears of an Ainu woman of Saghalin that "the most precious are the blue obsidian which they call *Krafto tama*, precious stone from *Krafto*; these blue corals [?] are found among all the peoples of the frigid zone, of the northern hemisphere, from the Great Ocean up to Behring's Straits, where they were found by von Kotzebue in the Sound which bears his name." A. J. C. GEERTS (Les produits de la nature japonaise et chinoise, p. 294, Yokohama, 1878) describes precious stones under the name *ruri-tama* (written with the Chinese characters *liu-li yü*) as of deep-blue color and entering into the necklaces of the ancient Japanese (the *shitogi* of the Ainu). He identifies them with lapis lazuli, and says that these very rare stones have been found on the Kurile Islands, several specimens of which are in the Museum

of Tōkyō. Under the name *Karafuto-tama*, that is, jewels of the Island of Saghalin, the precious stone par excellence of Saghalin and the Kuriles is understood, made into the necklaces called *shitogi*. They are well polished lustrous balls of blue or bluish color, but less dark than the *ruri-tama*. They are the product, adds GEERTS, of dark blue obsidian varying much in size; they belong, as the preceding stone, to a period posterior to the *maga-tama* and still serve as ornaments to the natives of the Kuriles. It is more than likely that the *ruri-tama* and *Karafuto-tama* are identical, and that the material in question is obsidian. Obsidian, as well known, is not a mineral proper but a natural glass, a black vitreous volcanic rock being produced where a rapid cooling of certain liquid lavas has taken place and occurring in many parts of the world, the coloration being black, gray, brown, yellow, red, green, sometimes also blue. A peculiar variety is known to our mineralogists from the river Marekanka near Okhotsk in eastern Siberia, hence called *marekanite*; these obsidian balls are partly colored evenly, partly of brown and gray, frequently also of yellow and red hues (MAX BAUER, *Edelsteinkunde*, p. 551). O. C. FARRINGTON (*Gems and Gem Minerals*, p. 181) gives for it also the name "mountain mahogany," and says that it makes a pretty stone, which is used for the manufacture of some objects. This material is doubtless the source for the precious beads of Saghalin and the Kuriles. Nothing is known to Japanese or foreign mineralogists of lapis lazuli found on the Kuriles, and the definition of Geerts must be considered an error. In the Ainu collection of the Field Museum there is a necklace (Cat. No. 88037) coming from Hakodate on Yezo, in which are strung six large, black obsidian balls (about 3 cm in diameter), together with many blue, green and white glass beads. J. BATCHELOR (*The Ainu and Their Folk-lore*, p. 154, London, 1901) states that the glass beads of which the Ainu women are extremely fond are of Japanese make, others appear to have come from China; the people believe that the ancients got them from the *Rushikai*, that is, Russians and Manchu. In the Annals of the Later Han Dynasty (*Hou Han shu*, Ch. 115, pp. 5a, 5b) the countries of the Fu-yü (see above) and the Yi-lou who lived over 1000 li north-east of the Fu-yü are reported to produce "red jade" (*ch'i yü*). Also in this case, the word *yü* cannot be construed to have the literal meaning of "jade," as no jade is found in those localities which were inhabited by the Fu-yü and Yi-lou, and I am inclined to regard the term *ch'i yü* as having likewise the significance of obsidian. The evidence for this supposition is furnished by the *Tu yang-tsa pien* (Ch. C, p. 1) in the passage above alluded to. In the tribute sent by the Fu-yü in 841 A. D. to Emperor Wu-tsung there were three pecks of "volcanic jade" (*huo yü san lou*), which was red (*ch'i*) in color. The pieces were half an inch long, pointed on top, and round below; they emitted their brilliancy at a distance of ten paces. Gathered in a cauldron they could be ignited, and the heat of such a cauldron placed in the house was sufficient to dispense with double quilted garments [which the Chinese use to wear in the winter, heating their bodies instead of their rooms]. The court-ladies of inferior rank availed themselves of this fire to heat a brand of wine called "clear wine" which had been sent as the gift of a foreign country. There can be no doubt of the identification of the term *huo yü* with obsidian; this expression literally means "fire jade," and "fire mountain" (*huo shan*) is the Chinese word for a volcano; *huo yü*, accordingly, is a fine stone of volcanic origin, and such a product of volcanic outflows is obsidian. The account of this substance being utilized as a combustible is quite credible, for obsidian "fuses rather easily before the blowpipe to a porous, gray mass" (O. C. FARRINGTON, *l.c.*, p. 180). This "fire jade" was red in color; accordingly, it was a *ch'i yü*, and this is the very designation which we encounter in the Annals of the Later Han Dynasty. For this reason we may conclude that the term *ch'i yü*, as pointed out in the above passage, serves for the designation of obsidian which itself was unknown in China.

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PLATE II

Woman from southern Tibet, to illustrate the mode of wearing jewelry: gold earrings inlaid with a mosaic of turquoise; gold amulet box (*gau*), the surface being filled with a network of designs formed of gold filigree and inlaid with seven choice turquoises of first quality; necklace composed of large turquoise, amber and coral beads; and silver chatelaine with ornamental halberd, toothpick, ear spoon, tweezers and small brush (lost) for oiling the hair (see *Jade*, p. 203).

All ornaments worn by this woman were acquired for the Field Museum (exhibited in the Gem Room, with a large collection of other Tibetan and Nepalese jewelry).



TIBETAN WOMAN SHOWING MANNER OF WEARING JEWELRY.

PLATE III

Tibetan woman in festival dress of Chinese silk. The chaplet is worn over an artificial wig of long flowing hair imported from China. The turquoises are sewed on to a foundation of stiff red cloth, and bandeaux formed by rows of artificial pearls are laid around the sides.



TIBETAN WOMAN IN FESTIVAL DRESS

PLATE IV

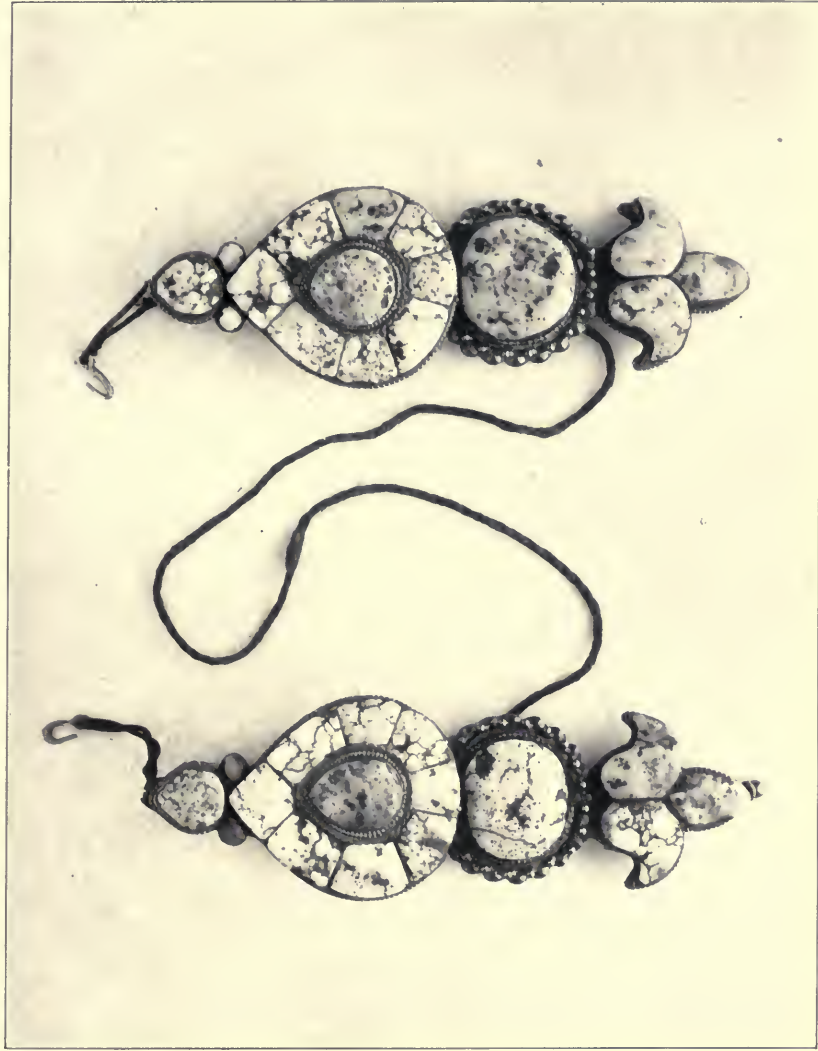
Tibetan woman wearing chaplet set with turquoises and artificial pearls; turquoise earrings; copper charm-box inlaid with turquoises suspended from a necklace; a quadrangular silver charm-box attached to the rosary; a silver chatelaine with five utensils; a silver belt with chain (called *digra*) falling down over the apron, caught up and fastened to the belt, and then again to the bodice, where it terminates in the figure of a rooster of silver. It is covered with plaques of gold filigree set with turquoises. She wears silver rings set with turquoises on the middle and fourth fingers of both hands, a white conch-shell as bracelet on her right arm, and a Chinese silver bracelet on her left arm.



TIBETAN WOMAN WITH COMPLETE JEWELRY.

PLATE V

Pair of Tibetan earrings, foundation of gold inlaid with a mosaic of turquois. The requirement of these mosaics is that the stones shall be well matched in color, resulting in an harmonious color arrangement. With this end in view, Tibetan women gather turquoises during many years, till they have the desired colors in the required number of stones. Such earrings belong to the most cherished property of a Tibetan woman and range from a hundred to six hundred rupees and more in price. From collection of Field Museum (exhibited in Gem Room).



TIBETAN TURQUOIS EARRINGS.

PLATE VI

Chinese Turquoise Carvings.

Fig. 1. Flat, polished and perforated turquoise of dark-blue color with black strata, mined in Hu-pei Province and worked in Si-ngan fu. Cat. No. 116679/3.

Figs. 2-4. Fanciful carvings of turquoise, Si-ngan fu, made for Tibetan and Mongol Lamas who use them as decorations on their tables, and also as paper-weights, 10, 8.5, and 12 cm high, respectively. Cat. Nos. 116663, 116664, 116666.



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CHINESE TURQUOIS CARVINGS.



PLATE VII

Chinese Turquoise Carvings.

Fig. 1. Bird carved from turquoise, serving for decorative purposes, and also as paper-weight, Si-ngan fu. 12.4 cm long, 3.8 cm high. Cat. No. 116665.

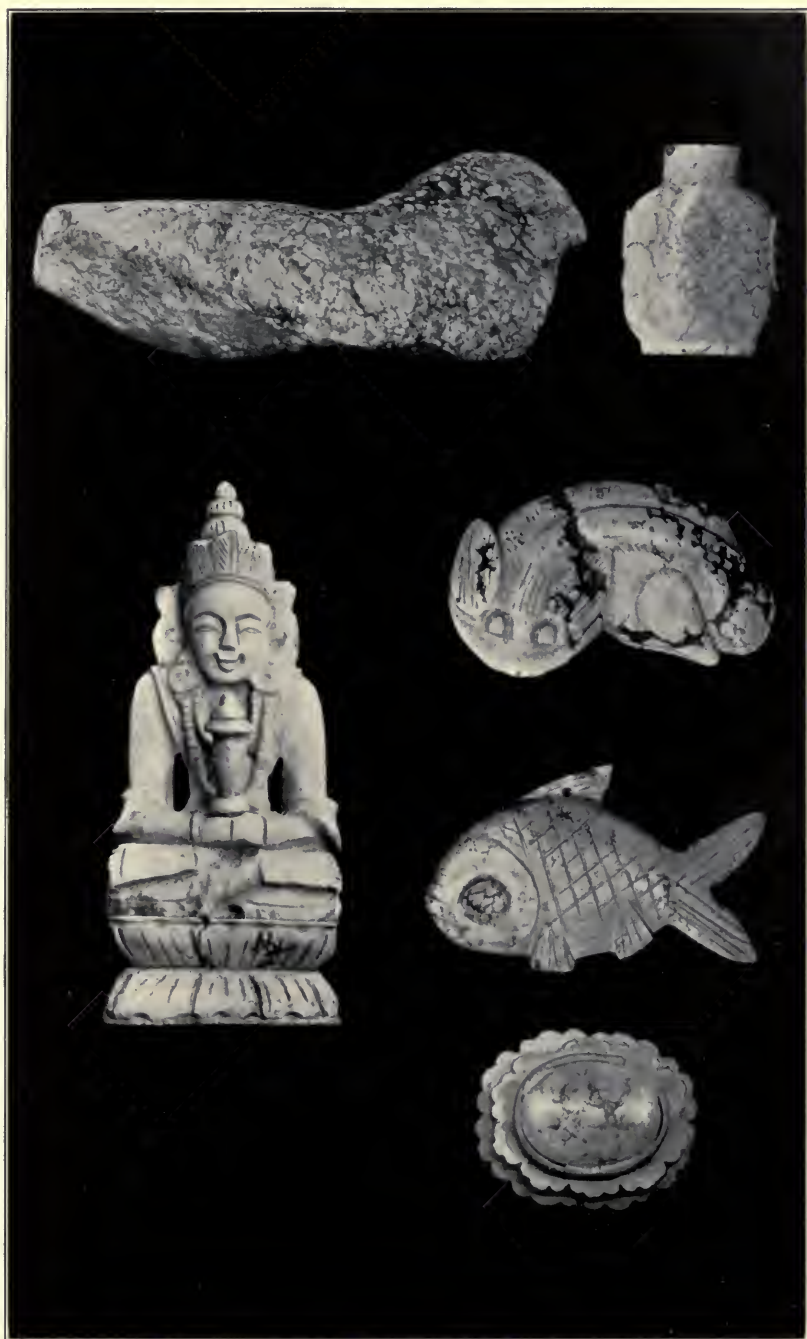
Fig. 2. Snuff-bottle carved from turquoise, Peking. 3.3 cm high. Cat. No. 116670.

Fig. 3. Turquoise carving of recumbent tiger, used as girdle-pendant, Si-ngan fu. 5.3 x 3 cm; 2.2 cm high. Cat. No. 116668.

Fig. 4. Turquoise carving of fish, both sides alike, used as girdle-pendant, Si-ngan fu. 5.4 x 3.3 cm. Cat. No. 116667.

Fig. 5. Turquoise carving of ornamental button in shape of blossom with a double row of petals, worn in front of cap or fillet, Si-ngan fu. 3.5 x 3 cm. Cat. No. 116669.

Fig. 6. Image of the Dhyānibuddha Amitābha, Lamaist type, carved from turquoise, Peking. 6.7 cm high. Cat. No. 116673.



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CHINESE TURQUOIS CARVINGS.

PLATE VIII

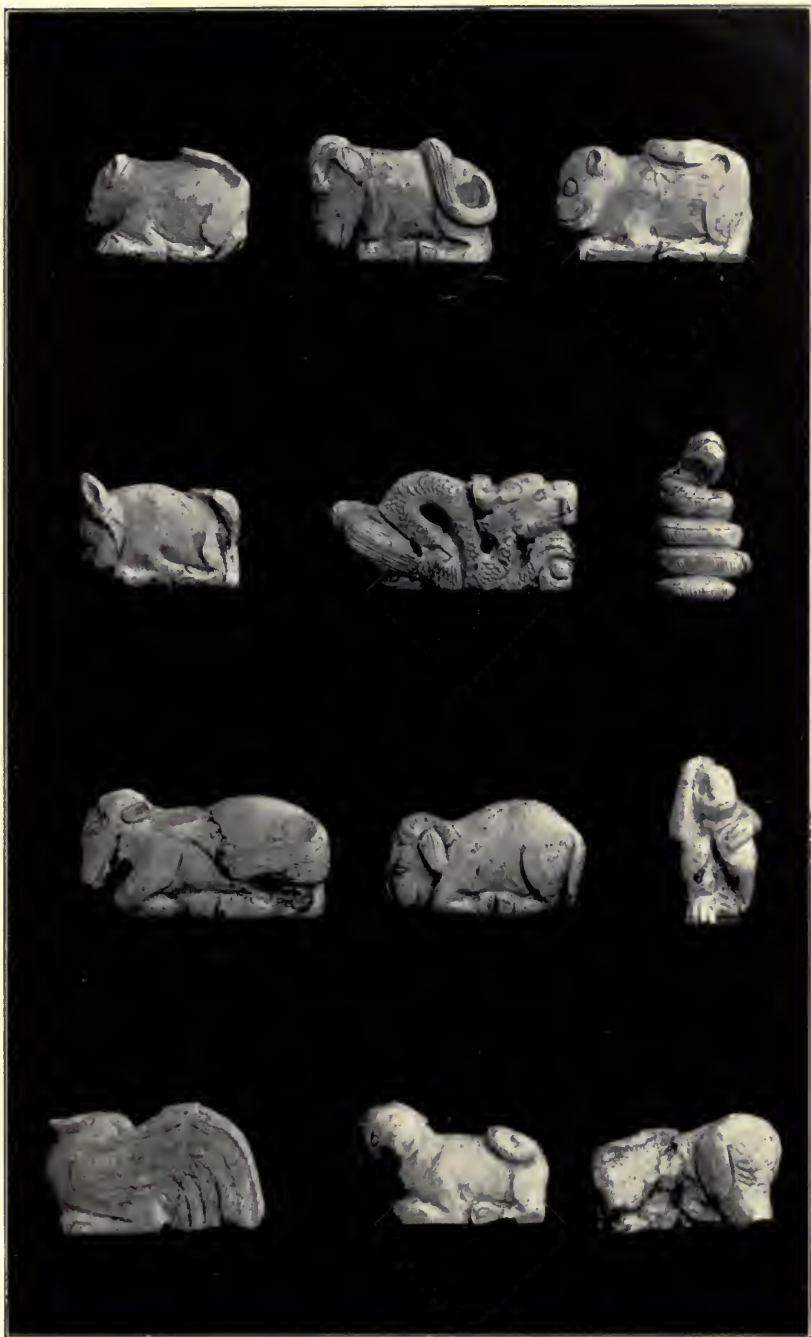
Chinese Turquoise Carvings.

The Twelve Animals representing the periodical cycle of twelve years. Carved from turquoise, Peking. Average dimensions of figures 5 x 3 cm, with a height of 2 cm. Cat. No. 116674.

The animals are:

- | | | |
|--------------|------------|-------------|
| 1. Rat. | 2. Ox. | 3. Tiger. |
| 4. Hare. | 5. Dragon. | 6. Serpent. |
| 7. Horse. | 8. Ram. | 9. Monkey. |
| 10. Rooster. | 11. Dog. | 12. Boar. |

See p. 63.



CHINESE TURQUOIS CARVINGS.

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