

NEPHRITE AND JADEITE.

BY LEONARD P. KINNICUTT.

AT the semi-annual meeting of the American Antiquarian Society held at Worcester, April 28, 1886, Prof. F. W. Putnam exhibited a collection of celts and ornaments, made of a green stone and known under the general term of jade, which were found in burial places in Nicaragua and Costa Rica. He pointed out that as this particular stone was not found *in situ* in America, possibly the original possessors of the implements brought them from Asia, where this variety of jade was known to occur. Among the specimens now in the Peabody Museum, Cambridge, are one elaborately carved celt, one large plain celt, and nine other specimens, either halves, quarters or smaller pieces of celts, all obtained from burial places in Central America. There are also similar celts and small axe-shaped implements made of the same mineral, obtained from the pile-dwellings of the Swiss lakes.

The finding of halves, quarters and smaller pieces of celts, and especially of two pieces which when united proved to be the two portions of a half celt, which had been perforated to be suspended as an ornament, and afterwards cut on a line through the hole and so made into two ornaments in each of which a hole was cut, shows that the original celts gradually became very rare and valuable, and were then cut and recut and cherished as ornaments, until finally these specimens were deposited in the burial mounds. As Prof. Putnam has stated, such facts deserve the most careful consideration as records of the probable migration from Asia of the ancient people of Central America.

Since Prof. Putnam's paper several articles have appeared on the discovery of jade in Alaska; and the view held by Prof. Fischer and brought forward independently by Prof. Putnam at the meeting of 1886 has been severely criticised. The term jade has been and is used to designate at least two different minerals, both of which are very hard green stones with a high specific gravity, and having about the same degree of fusibility. These two minerals, nephrite and jadeite, are, however, as regards their composition very different. Nephrite is a silicate of lime and magnesia, containing a little iron oxide and alumina, while jadeite is a silicate of alumina and soda, containing small amounts of iron oxide, lime and magnesia.

Since Alaska belonged to the United States it has been visited by many official expeditions. A number of worked specimens of "jade" have been found, and the stone itself has been found, *in situ*, north of the Kowak river, about one hundred and fifty miles from its mouth.¹ A large collection of these specimens were recently examined and analyzed by Prof. F. W. Clarke and G. P. Merrill of the United States Geological Survey, and the results thus obtained proved that all the specimens are nephrite, not a single jadeite having been found among them.² The specimens obtained from Central America and Mexico are, however, not nephrite but jadeite, and it does not appear that a single true nephrite has yet been obtained from these localities.³ In South America we again find objects made of nephrite, and Prof. A. Derby states that all the "jades" described by Dr. L. Netto from the valley of the Amazon, are nephrite and not jadeite.⁴ Therefore the question asked

¹ Proceedings of the U. S. National Museum, 1888, p. 116.

² *Ibid.*

³ A. P. Meyer. Ueber Nephrit und ähnlichem Material aus Alaska. Jahresbericht [xxi.] des Vereins für Erdkunde zu Dresden, 1884. F. W. Clarke and G. P. Merrill. Proceedings of the U. S. National Museum, 1888, pp. 122 and 125.

⁴ Museo Nacional, Rio de Ganaro. Vol. 6, 1888, p. 527.

by Prof. Putnam, "What is the original source of the jadeite objects found in Central America and Mexico?" still remains unanswered.

Mr. Dawson, Assistant Director of the Geological Survey of Canada, in a paper published in 1887,¹ seems to consider the question fully answered by the discovery of nephrite in Alaska, and gives a translation of Prof. Meyer's paper, in which the same opinion is maintained. The finding of nephrite in Alaska, even, as it is claimed, *in situ*, does not answer the question concerning the occurrence of worked jadeite in Mexico and Central America. The fact that a hard green stone—used by the natives of Alaska, and not by the ancient people of Central America—is found in Alaska, does not prove that a different hard green stone, revered by the early inhabitants of Central America, occurs *in situ* on this continent.

The statements, therefore, made by Prof. Putnam, that jadeite is not known to occur *in situ* in America, and that implements and ornaments found in Nicaragua and Costa Rica agree in all respects with the Asiatic jadeite, and that, consequently, the finding of these objects in the burial mounds of Central America tends to show that the original possessors of the implements, from which the ornaments were made, brought them from Asia, have all their original force and are in no way invalidated by the publications of Meyer and Dawson.

I may state that I have examined a number of specimens of nephrite and jadeite, including the jadeites from Central America now in the Peabody Museum at Cambridge, specimens of nephrite from Alaska, South America and New Zealand, and also jadeite from Asia. Many of the specimens were carved and of high polish and great beauty, and could not be sacrificed for the purpose of quantitative analysis. Of the many analyses made I only give in this

¹ Canadian Record of Science. Vol. 2. No. 6, April, 1887.

place those necessary to show the essential identity of the nephrite from Alaska with that of New Zealand, and its dissimilarity to the Asiatic jadeite, which corresponds with the jadeite from Central America.

No. 1. A small piece of the New Zealand nephrite. Color, light green. Specific gravity 3.002.

No. 2. A small implement from the pile-dwellings, St. Aubin, Switzerland. Color, light green. Specific gravity 3.015.

No. 3. The Everette pebble, Kowak river, Alaska. This is a water worn pebble, of a dark green color, and a specific gravity of 2.99.

No. 4. A partially worked ornament from Canton, China. Color, light green. Specific gravity 3.335. A typical specimen of Asiatic jadeite.

No. 5. A partially worked stone from Costa Rica. Polished on all sides, except the two ends which are fractured as if it were intended for an ornament, but never completed. It also shows where it was sawed from a larger piece. No. 32794, Peabody Museum, Cambridge. Color, light green. Specific gravity 3.333.

ANALYSES.

	No. 1. Nephrite. New Zealand.	No. 2. Nephrite. St. Aubln.	No. 3. Nephrite. Alaska.	No. 4. Jadeite. Asiatic.	No. 5. Jadeite. Costa Rica.
Loss on ignition,	0.54	1.03	1.90	0.33	0.10
Silica,	57.97	57.19	55.52	58.11	57.96
Ferrous oxide,	4.71	4.80	7.05		
Ferric oxide,				0.94	1.40
Alumina,	0.50	1.24	0.39	24.04	24.53
Magnesia,	22.82	22.27	21.69		
Lime,	13.38	13.32	13.05	1.66	1.66
Alkalies,				14.92 ¹	14.35 ¹
	99.92	99.85	99.60	100.00	100.00

¹Determined by difference.

The beautifully worked axe-head which I found in the museum of the American Antiquarian Society with the simple label "From South America," and whose history is unknown, is of a dark green color, weighs 256 grammes, has a hardness of 6, a specific gravity of 2.859, and a fusibility a little below 3. I therefore believe it to be a nephrite, and probably from the valley of the Amazon.¹

In connection with this subject, the following letter, which I have permission to publish, giving a very curious account of the discovery of jade in Australia, seems to me not without interest.

EAST MILTON, Mass., *April 3, 1889.*

Prof. KINNICUTT.

My Dear Sir:

When I was young in China, say about 1847 to 1851, the story was often related, especially to strangers, how, "once upon a time" an officer of a small vessel was wrecked or embayed in a rocky bay on the south coast of Australia, and having been trading in China he was attracted by a belt or vein of green stone that looked to him like jade, that ran along the face of the cliffs. He took some small fragments, and in due time, being in China, found that it was true jade. He then tried to get up an expedition, and failing, the merchants finally got one of the adventurers always hanging about eastern ports, who happened at the moment to be in funds, to charter and fit out a schooner, and the two sailed off together.

The tradition did not say how long they were gone, but intimated that it was some months. At last they returned, and, it not being possible to trade at that time except through an established house, they consigned to Russell & Co. But they insisted on conducting their business them-

¹The Society has also in its museum plaster casts of the two celebrated Mexican chalchihuites, the Humboldt celt, and the Leyden Plate, presented by Dr. J. J. Valentini of New York. A valuable paper of Dr. Valentini, on these two chalchihuites and on the occurrence of jade ornaments in Central America and Mexico, is to be found in the Proceedings of the American Antiquarian Society. New Series. Vol. I. Page 283.

selves, and so came up with their specimens from Whampoa, the ship anchorage—all this was at Canton—and after due appointments went round to Curio Street and met the jade dealers. They made careful and exact inquiries and said they would hold a Consoo and answer in a week. Meantime they debated the question as to what they would do, for the influx of such an unheard of quantity of jade would ruin them.

They were equal to the occasion, however, and at the end of the week returned the answer that it was true jade undoubtedly, but too young. That it would take a thousand years to make it suitable, and meantime they declined to buy at any price. Canton being the only port open there was nothing to be done but to abandon or store their treasure. They stored it in Russell & Co.'s receiving ship at Cumsingmoon, an outpost near Macas, in boxes, and took a receipt, and there was an end of the story or legend, which few believed but which was faithfully told to every new comer as gospel truth. When our jolly skipper from Cumsingmoon, was at Canton on a lark, he used to declare that he could still see pieces of the jade "as big as a hat" lying among the ballast, but as the receiving ship had been twice changed and he was a great fellow for yarns we believed it all the less.

In 1851, being then the junior partner of the house and in charge of that department, I received a letter addressed to the house from Macas, which for the moment made me feel as if a skeleton hand had come up through the floor. It was from an unknown party, saying that in such a year, twenty or so before, some boxes of jade had been deposited with us and that the owners would now like to take delivery and enclosed a copy of receipt.

There was need for caution, for where was the jade and what was its value, supposing that there really was any. I got time by answering that I would immediately write to Cumsingmoon and get the jade ready for delivery and let them know. I asked the captain if there was any jade at Cumsingmoon, to get it all together and pack it in the required number of boxes, using old wood and rusty nails. Fortunately the weight was not given. Then we looked up letters of the former captain's and got his signature so that no false receipt could be palmed off on us by some one

who had heard the old story, and sat waiting rather anxiously for the captain's answer.

He reported that there proved to be much more jade than any one had supposed and that he had successfully packed up, as I remember it, fifty boxes. Being now ready, I sent to the Macas parties, notified them that the jade was ready for delivery on the production of the proper receipt and the payment of the enclosed bill for demurrage, amounting to seven thousand and odd dollars, considering that sum sufficient to head off a joke, if one were intended. We rather thought that we had heard the last of the jade merchants. On the contrary, by the return boat came the \$7000. The fifty boxes were taken on the true and original receipt and we never heard another word about the matter.

Yours respectfully,

EDWARD CUNNINGHAM.

Is it not possible that this story refers to the discovery of the now well-known vein of nephrite in New Zealand?

TIME OF ANNUAL MEETING.

The proposed amendment of the By-Laws, in regard to the time of holding the Annual Meeting of the Society when the 21st of October falls on Sunday or Monday,—as described on page 11 of this number of the Proceedings,—was unanimously adopted by the Society. In preparing the report for publication, this fact was accidentally omitted.

COMMITTEE OF PUBLICATION.

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