

(2) Near long. 80° E., is the co-tidal hour ix.?

(3) Near long. 135° E., is the tide chiefly solar? If so, is the co-tidal (solar) hour xii.?

(4) On the western coast of Graham Land, is the co-tidal hour vi.?

Although it seems that no observations have been made farther south than Kerguelen, South Georgia, and Cape Horn, there are reasons for believing that the above questions can be answered in the affirmative. If so, then certain logical connections between the tides in this region and elsewhere would be fairly well established. At any rate, such observations would be valuable; and it is believed that the results would compare favourably in importance with those obtained in almost any one of the lines of inquiry alluded to by the leader of the expedition.

R. A. HARRIS.

Washington, D.C., February 28.

#### Crab Ravages in China.

IN the "Kwoh-Wu," or "Good Words from the States," attributed to Tso Kiu-Ming (6th century B.C.), a king of Yueh (now the province of Cheh-Kiang) is said to have been advised by his counsellor to postpone his warlike preparation with "good words," in which the officer adverts to the "Rice-Crab (*Tau-Hiai*) that spared for man not a seed [of rice] in late years." A Japanese naturalist, Aoki Kon-yō, quoting a Chinese work, "Ping-Kiang Ki-Sze," speaks of a crab-devastation which took place in the Wu District (now Kiang-Su) in 1297 A.D., "when all plains were full of crabs, wasting all crops of rice." ("Kon-yō Manro Ku," written 1763, ed. 1891, p. 164.)

Twan Ching-Shih (died 863 A.D.) briefly speaks of this crab, thus: "In the eighth moon of the year, the crab has in its belly an ear, really that of rice, about an inch long, which it carries eastwards as a present to the 'God of the Sea';<sup>1</sup> before the carriage is accomplished, the crab is not edible" ("Yu-Yang Tsah-tsu," Jap. reprint, 1697, bk. xvii. fol. 4, a). Contemporaneously, Luh Kwei-Mung (died c. 881 A.D.), in his "Notes on the Crabs" (*ap.* "Yuer Kien-lui-han," 1701, bk. 444, fol. 18) narrates:—"These crabs live in holes, which they dig in bogs, until the season that intervenes the autumn and winter, when they emanate from their homes. The people of Kiang-Tung say, when rice is ripening, the crabs take each one ear in order to pay court to their chief. Every morning and every evening they all run towards the river, when men fish them by setting weirs across the affluents. Yet six or seven out of ten crabs would pass over the dams, and in the river they grow larger; whence they proceed to the sea in the same manner as their previous march, also being persecuted as before, which, however, they escape with more skill than in former occasions." Later, in the dynasty of Sung (961—1279 A.D.), appeared a "Monograph of Crabs," by a certain Fu Kwang, who relates in it:—"In the crevices on rocks along mountain streams occurs a small crab, red and hard, and so named *Shih-hiai* (Stone Crab). When still young, in mid-summer, owing to absence of any edible cereals, it feeds on the root of reed, whence its name *Lu-han-hiai* (Reed-root Crab), and is meagre in size and taste. About the eighth month it grows larger after moulting, and, when rice or millet is mature, every one crab belled with one spike of the cereal runs to the river, when it is termed *Loh-Hiai* (Merry Crab), and is very fat and best to eat. Thus it goes to the sea where it presents the spike to its chief" (*ibid.* fol. 19, a). These are very good samples of the celebrated celestial whims, which once expressed, no literatus doubts; for, to me, it is too clear that the tribute which these so-called "grain crabs" are said to pay to their king is nothing but their spawn, which they carry under the abdomen to lay down in the sea.

I do not know whether the rice-carrying crab is the same with what devastates the plantations, as is supposed by Aoki (*l.c.*), although very probably so. And I shall be very much obliged if, through your medium, some one will answer my questions: (1) What species of crabs is the cause of such stories? and (2) Is such a crab-ravage reported in modern times from China? From De Rochefort's "Historie . . . des Iles Antilles," Rotterdam, 1665, p. 255, I gather the renowned Violet Land-Crabs of the West Indies to make some damage to tobacco farms, but not to grain as is so vastly attributed to the Chinese crabs;

<sup>1</sup> The Japanese who worship the deity of Kotohira (the patron-god of mariners) taboo the eating of crabs.

while F. Legnat, about the end of the 17th century, described a land-crab of Rodriguez, whose destructive power during its emigrating period appears to equal that of its Chinese kin (see his "Voyages," ed. 1891, p. 92).

Yu Pau (4th century A.D.) writes in his "Sau-shin-ki":—"In the year 283 A.D. all crabs in the District of Hwui-Ki were turned into rats, whose group covered the rice-farms and made an extensive devastation. When yet immature, these rats had hair and flesh but no bones, and unable to pass over the ridges in the farms, but became vigorous after a few days." This erroneous exposition, to account for the origin of rats or field-mice, would seem partly to originate in some similarity of the fur of rats with that of the so-called Hair-Crab (see Stebbing, "Crustacea," Pl. III.), but more in the people's familiarity with the land-ravaging crabs<sup>2</sup> in ancient times.

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#### Leonid Meteor Showers.

I HAVE nowhere seen an account of a very remarkable display of these meteors visible here (in Shanghai) on the morning of November 15, 1886. Though the date is distant, it may be of use to record it, as it may throw light on the conditions of the orbit.

I was sleeping in a room with an almost due north exposure looking into an open compound, and chanced to wake up about three in the morning, when I saw a number of meteors flashing across the window. I got up on recollecting the date, and for about an hour witnessed the most brilliant pyrotechnic display I have ever seen.

The meteors were flying in every direction from the radiant point in numbers past all calculation, and the intensity of the shower was kept up without intermission the whole of the time I was gazing.

I expected to hear from other quarters an account of the phenomenon, and was much surprised to find it had apparently not been noticed elsewhere. I had to leave shortly after for the interior, where I was practically cut off from communication with the outer world for some months, and hence did not at the time report the fact.

As much stress is laid on the appearance of the meteors in Europe in 1833 and 1866, the shower may be some of interest.

Shanghai, February 12. THOS. W. KINGSMILL.

#### The Capture of Butterflies by Birds.

CONCERNING the capture of butterflies by birds, permit me to relate an incident which I witnessed in the summer of 1899 at the Deserted Village, near Scotch Plains, N.J.

My attention was attracted to a maple tree on a lawn by a violent fluttering of the wings of a robin among the leaves. Presently a large brown butterfly, evidently wounded, but still attempting to fly, fell from the branches. The robin pursued the butterfly eagerly, and attacked it upon the ground, alternately striking with its beak, with lowered wings, and running off a short distance to observe developments. Finally, the butterfly ceased to move. The robin thereupon tore the body from the wings and devoured it. I picked up the mutilated wings and showed them later when narrating the incident.

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GEORGE A. SOPER.

#### The Smell emitted by Quartz when Rubbed.

WHEN two quartz pebbles are rubbed hardly, or ground together, so as to give an electric spark, that seems under their surface, and then smelt, they emit a very peculiar smell, which some people call a sulphurous smell, but I cannot trace any resemblance to sulphur, or ozone, or phosphorus. What is it supposed to be?

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25 Claremont Square, N., March 7.

<sup>2</sup> The "Hair-Crab" of Japan is caught in the same way as the Chinese mode of fishing the rice-carrying crab. The Japanese well know its descent down the river in autumn, and have well noticed it never to reascend it afterwards as some fish do (Kaibara, "Yamato Honzō," 1708, bk. xiv. fol. 48), but never possessed a belief in a crab carrying grain to the sea. Only one case that slightly approaches that of the latter, I find in "Hokusō Sadan," where it is narrated that near the end of the last century the river Yodo, near Kyōto, was one day so swarmed with small crabs that every handful of water was full of these creatures.