23. *On a* FOSSIL SPECIES *of* CAMPTOCERAS, *a Freshwater* MOLLUSK *from the* EOCENE *of* SHEERNESS-ON-SEA. By Lieut.-Colonel H. H. GODWIN-AUSTEN, F.R.S., F.G.S. (Read March 22, 1882.)

[PLATE V.]

I HAVE now had by me for a long time, waiting for description, some very interesting fossils, obtained by Mr. W. H. Shrubsole near Sheerness; and I owe Mr. Shrubsole some apology for retaining them so long unnoticed. In July 1880, when looking over some of Mr. Shrubsole's fossils from the above neighbourhood, he showed me this specimen, which, he informed me, had very much puzzled several naturalists to whom he had submitted it. It recalled at once an East-Indian form with which I was familiar; but I could not at the moment give Mr. Shrubsole the name. On returning to town on the 2nd of August I looked up the genus in my collection, and wrote (confirming my original opinion) that I considered the shells to belong to Benson's genus *Camptoceras*. Dr. H. Woodward saw the same specimen in September 1880, and expressed the same opinion in a letter of the 23rd to Mr. Shrubsole; and on hearing I had previously seen the specimen and identified the genus, he forwarded the same to me in February 1881. I may also mention that Messrs. Etheridge and Newton in October, having seen Mr. Woodward's letter and reexamined the specimen, were also of the same opinion.

As it is the first record of the genus occurring fossil, I shall enter somewhat fully into an account of it, giving Benson's original description, and noticing the species now known to us.

Genus CAMPTOCERAS, Benson.

Camptoceras, Benson, Calcutta Journ. of Nat. Hist. p. 465 (1843); Ann. & Mag. Nat. Hist. (2) vol. xv. p. 9 (1855).

"Testa sinistrorsa, imperforata, elongato-elliptica, spira soluta, apice acutiusculo, sutura late et profunde excavata (re vera omnino carente); anfractibus 3–4 angustis elongatis, superne et subtus carinatis, lateribus planulatis; apicali elongato-acuminato, longe exserto; ultimo antice superne descendente, carinato; apertura soluta, integra, magna, spiram non æquante, elongato-elliptica, angustiuscula, superne et ad basin arcuatim angulata; peristomate acuto; operculo nullo."

The first species, *C. terebra* * (Plate V. fig. 8), on which it was founded, was taken by Dr. Bacon, in company with Mr. Benson, in a piece of water that had previously formed a portion of the Ram

* Ann. & Mag. Nat. Hist. (2) vol. xv. p. 10 (1855), with outline figure; Journ. Asiat. Soc. Bengal, vol. xl. 1871, pl. ii. figs. 1, 1*a*; Conch. Indica, p. 64, pl. clviii. figs. 1, 2; Adams, Gen. Recent Mol. p. 258, pl. lxxxiv. fig. 1.

Gunga river, near Moradabad in Rohilkhund, India. Benson thus describes the animal :—

"Animal tentaculis duobus filiformibus, obtusis, oculis magnis inter tentacula sitis, proboscideque mediocri munitum ; pallio labia testæ haud transeunte ; pede brevi, longitudinem aperturæ vix superante."

"The form of the tentacula and the position of the eyes, situated between the filiform tentacula, and sessile on the head (not as in *Lymnæa*, occupying the fore part of the widened base of the triangular tentacula), at once distinguish the animal from that of *Lymnæa*. In *Camptoceras* the eyes are large in proportion to the size of the animal, while in *Lymnæa* they present only a minute black point, even in individuals of large size." . . . . "The shortness of the foot, however, the sluggish movements of the mollusk, and its strong adhesion to smooth surfaces, point to an affinity with *Ancylus*, which, instead of presenting the elongate, imperfectly rolled, acutely spiral cone of *Camptoceras*, sinks into a widely-spread, depressed cone, with scarcely any distortion of the spire." *Ancylus* is also sinistral.

"The animal adheres, in deep water, to the decaying stems of a reedy sedge, more frequently burrowing into them, and concealing itself between the internal layers ; a habit which renders it difficult to detect."

It occurred with species of *Planorbis* and *Ancylus*, was very local, and was taken in February 1842; but at the end of 1845 no more could be found, and it has never since been found by any collector in India. As Benson remarks, it may be more abundant during the rainy season in July and August; but the character of the surrounding country is not then favourable in point of healthiness or practicability for exploration.

In March 1869, when encamped near some marshes at Nazirpur, near Shushong-Durgapur, in the Mymensing district under the Garo hills, and where I often searched for shells, I was so fortunate as to discover two other species of *Camptoceras* living together. The water of the "Beels," as marshes are called there, was then fast drying up ; and all the specimens that I found were adhering tightly to the surface of the dried-up water-plants, a few feet from the water's edge*. I had no leisure to watch and examine the animals, and on my arrival in Calcutta, a short time afterwards, gave them over to Mr. H. F. Blanford, who described and figured them in the 'Journal of the Asiatic Society of Bengal,' pt. ii. 1871, pp. 39–41, under the names of *C. Austeni* and *C. lineatum*, the former, of which I give an outline figure (Plate V. fig. 9), being nearest to *C. terebra*.

The fossil species is nearest to *C. terebra*, Benson, in the form of the whorls, but differs considerably in their greater number and more elongate form. Unfortunately the aperture has not been preserved entire in any of the specimens on the little block I have before me. *C. lineatum* was abundant where I found it ; and the fossil species

* This same ground, a few months after, during the rains, would be 10 or 15 feet under water.

appears to have been the same, judging from the large number of specimens. Although apparently so rare a shell in India, I believe it will be yet found more widely distributed, and that other forms will be found when the enormous area of the deltas of the Ganges, Brahmaputra, and Indus is more closely searched. These shells are very minute, and can only be obtained at a certain low state of the rivers and marshes.

Description of fossil Species.

CAMPTOCERAS PRISCUM, n. sp. Plate V. figs. 1–5.

Locality. Higher level of cliffs, about halfway between East-End Lane and Hensbrook, Island of Sheppey, Kent.

Shell sinistral, very elongate; a slight indication of spiral ribbing in the casts; spire elongate; apex very acuminate and slightly curved; suture wide and deep; whorls 4, disunited, rather rapidly increasing, and constricted at intervals, then becoming tumid; aperture not well made out, evidently oblique, circular or oblate, and reflected slightly at the peristome.

Var. OBTUSUM. Plate V. figs. 6, 7.

Similar to above, but the apex much shorter and blunter, and the whorls more compressed together.

	millim.		millim.
Size. Major diameter	1·5	alt. axis	6·5
,, recent species: *terebra*	3·0	,, vix	9·0
,, ,, var. *Austeni*	1·0	,, ,,	3·75
,, ,, *lineatum*	2·3	,, ,,	4·5

Some of the specimens are beautifully preserved, and are not mere casts; it is unfortunate that the aperture is more or less incomplete in every shell, although in the two pieces of stone I have seen there are over a hundred of them.

I cannot do better, to describe how and where it was found, than give an extract from Mr. Shrubsole's letter to me, dated 7th January, 1881:—"The shells did not come from the well, but from the higher level of the cliffs. I was showing a field-class how to look for fossils on the beach; and whilst we were standing in a group I was asked a question respecting the septarian nodules scattered about. After telling all I could about them, I stooped down and examined the broken one at my feet. Seeing a thin calcareous line near the surface of the nodule, with a blow of the hammer I exposed the shells; and I could not identify them: I brought them home. I gave away to those with me all I found beside." . . . . . "I cannot tell from what horizon in the London clay the nodule came, except that it must have been within the uppermost 150 ft."

No discovery could possibly show better what a broken chain geological evidence affords us of the extension and distribution of genera. Here one fortuitous blow of the hammer disclosed some dozens of a genus never before found, or rather recorded, as fossil in Europe,

and one which even now is so locally distributed in the east that it has only been found living by three individuals, in two widely-separated spots. Mr. Shrubsole may be complimented and congratulated on having brought to light so interesting a fossil form.

EXPLANATION OF PLATE V.

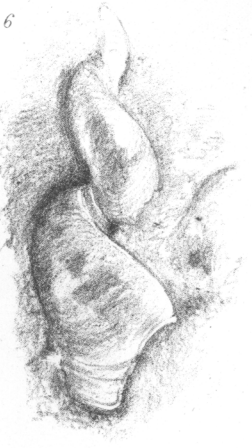
Fig. 1. *Camptoceras priscum*, n. sp., × 12. Length 4·2 millim.
2. ,, ,, × 4.
3. ,, ,, apex, × 12.
4. ,, ,, impression showing oblique aperture, × 12.
5. ,, ,, broken at the constriction.
6. ,, ,, var. *obtusum*, × 12.
7. ,, ,, do. apex. × 12.
8, 8*a*. *Camptoceras terebra*, Benson, × 4.
9, 9*a*. ,, *Austeni*, H. F. Blanford, × 11.

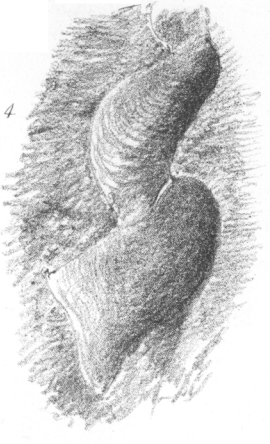
Discussion.

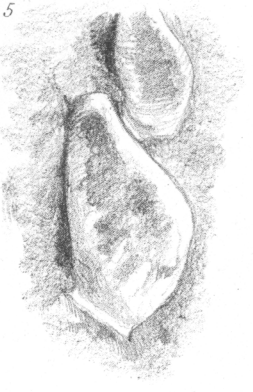
Mr. Etheridge remarked on the interest of finding in Britain an Eocene freshwater shell of a genus now living only in India. The genus appeared to be near *Physa*.

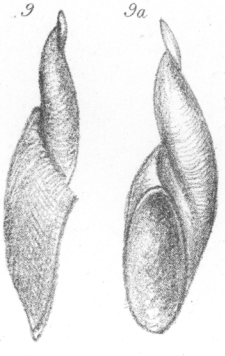
Mr. Gardner said that it was interesting to find so remarkable a tropical form so high up in the London Clay. He thought there was evidence that the more tropical forms of fruits occur in the higher beds of the London Clay.

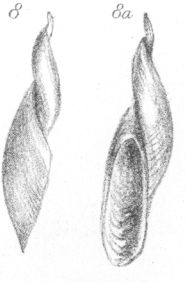
The Author was unable to say what genera of plants were found in association with this land-shell in India; but Canes, Palms, Ferns, and large grasses grow on the edges of the marshes.











H.H.Godwin-Austen, del et lith.

Maclure & Macdonald, imp

CAMPTOCERAS.