and if either tridymite or cristobalite, formed under any conditions, be kept in contact with a melt in which it is slightly soluble, for a comparatively short time at a temperature below 870°, it will pass over into quartz, and no record will be left of the previous existence of the higher form.

The α-β inversions of each of the three minerals are of a different class. They take place immediately when the appropriate temperature is passed in either direction, and the value of the α-β inversion-point of quartz at 575° as establishing a point on the geological thermometer, is left unchanged by the present investigation.

HELMINTHOLOGY.—*Further notes on Tricoma.* N. A. COBB. Communicated by F. V. Coville.

In the years 1888 and 1889, while carrying on some investigations at the zoological station at Naples, where thru the liberality of the British Association for the Advancement of Science, I had the use of one of its tables, I discovered a remarkable nematode—so remarkable indeed, that competent helminthologists have repeatedly expressed doubt as to whether it is really a nematode.

Later a short note on this species was published in the *Proceedings of the Linnean Society*[1] (N. S. W.) under the title, *Tricoma* and other New Nematode Genera, concluding with the words "These few notes comprise all that is known concerning the structure of a worm, which, were it less remarkable, I should not notice at this writing."

The note in the *Proceedings* was accompanied by two carefully drawn figures, one of the head and the other of the tail. Unfortunately the only preserved specimen in existence at that time was lost immediately after the drawings were made, so that no further details were available. However, before the specimen was lost I had become thoroly satisfied that it was a nematode of typical internal organization, but with an unusual development of the cuticle. This development is so exceptional as

[1] Vol. viii (Series 2). October 25, 1893.

to obscure the natural relationships of the species. These first came to light thru a careful microscopic investigation of the internal anatomy.

Tho the published figures mentioned above are accurate so far as they go, they are unfortunately incomplete, and this incompleteness of observation led to the adoption of a generic name, *Tricoma*, which is misleading. Instead of three cephalic setae, there are four. Later researches have shown that the setae on these worms are very fragile, and even now, in spite of the examination of a larger number of specimens, a full knowledge of the setae has not been obtained. It is certain, however, that all the known species possess four cephalic setae.

During visits to the Island of Jamaica I have latterly come across a second species of *Tricoma*, inhabiting marine algae and adjacent sand. As very few specimens were found, the inference is that the individuals are not common. All those found came from near low tide mark on open, rocky sea-shores subject to the unosbstructed action of ocean waves. Soon after discovering the Jamaican species I received, thru the kindness of my friend, Mr. F. Muir of Honolulu, a collection of free-living nematodes from Larat, an island off the east end of New Guinea, and in this collection also there were a few specimens of *Tricoma*.

Prof. E. Bresslau, writing from Strassburg, informs me that he observed a specimen of *Tricoma cincta* on the coast of Heligoland in the North Sea.

It thus appears that *Tricoma* is a genus having a very wide distribution.

The accompanying figures are largely self explanatory. It is only necessary to add a few words concerning the missing features.

The single cephalic seta, *c*, was drawn from another specimen on which it grew. The setae, *bb*, drawn with dotted lines, are reconstructions on the basis of the seta, *c*. Here and there on the figures irregular scattered setae are shown. These are the ones that actually existed on the specimen drawn. The dots indicate the annules of the cuticle on which the stumps of broken off setae were observed. It will be seen, therefore, that

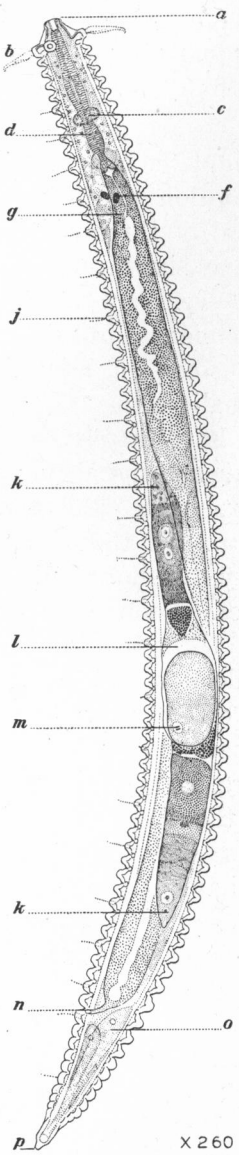

Fig. 1. Female of *Tricoma similis*, n. sp.

a, mouth opening and pharynx;
b, reconstructed cephalic seta;
c, nerve ring;
d, esophagus;
f, eye-spot;
g, intestine;
j, annule of the cuticle;
k, blind end of ovary;
l, location of the vulva;
m, nucleus of egg;
n, anus;
o, one of the three caudal glands;
p, spinneret.

the worms are hairy thruout. The mouth cavity is very small, prismoid and unarmed. Three obscure lips occur. Neither the Jamaican species, *T. major*, nor the Larat species, *T. similis*, appear to possess the cephalic alae observed in *T. cincta*. Otherwise the head on all three species has practically the same form, namely, approximately that of a quadrangular, blunt, truncated pyramid, with two edges of the pyramid ventrally submedian and the other two dorsally submedian. The four corners of the base of the pyramid project slightly and to them are attached the four cephalic setae. No labial papillae have been seen. There is some uncertainty about the function of the two pigmented submedian bodies behind the base of the neck. Their form, number and position somewhat favor the supposition that they are eye-spots, but if so they are farther back than in any species of nematode known to me. No lateral organs have been seen. There occurs uniformly in three specimens of *T. similis* an organ of considerable size in the body cavity on the ventral side just behind the oesophagus. It seems probable that this is the ventral gland and that it has a smaller companion cell in its rear, after the manner of the ventral gland in *Spilophora, Chromadora* and related genera.

In this species the ventral excretory pore appears to be in the seventh annule. The caudal glands are confined to the tail and empty thru the relatively massive, nipple-shaped spinneret. The female sexual organs are double, symmetrical and outstretched. The eggs appear to be deposited before segmentation begins. The male possesses a single outstretched testicle. The spicula are two in number and equal, and are accompanied by a well developed accessory piece.

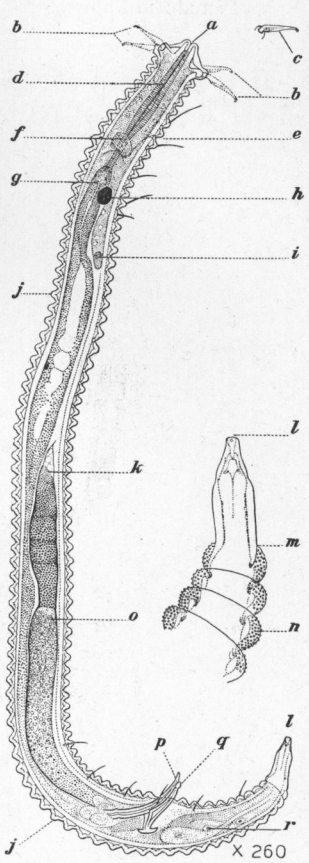

Fig. 2. Male of *Tricoma similis*, n. sp.

a, mouth and pharynx;
b, reconstructed cephalic setae;
c, drawing of single seta of another specimen;
d, esophagus;
e, excretory pore;
f, nerve ring;
g, intestine;
h, eye-spot (?);
i, ventral gland (?);
j, annule of the cuticle;
k, blind end of testicle;
l, apex of the spinneret;
m, base of the spinneret;
n, tuberculate surface of annule;
o, uterus;
p, one of the 2 spicula;
q, accessory piece;
r, one of the 3 caudal glands.

The following are the known species of *Tricoma:*

1. *T. cincta*, Cobb. Marine sand, Bay of Naples.

Dimensions unknown.

2. *T. similis*, n. sp. Larat, East Indies. Eye-spots at the twelfth annule. Male tail of eleven annules.

38							40						
2·	8·	13·	–57–	90·	0·6 mm.		0·7	11·	15·	–M	83·	0·5 mm.	
5·	7·	7·	8·	5·			2·1	5·7	5·8	6·5	6·3		

3. *T. major*, n. sp. Jamaica, West Indies. Eye-spots at the ninth annule. Male tail of seven annules.

Female unknown.

$$\frac{1{\cdot}3 \quad 5{\cdot}9 \quad 9{\cdot}5 \quad \overset{40}{-M} \quad 92{\cdot}}{3{\cdot}4 \quad 4{\cdot}5 \quad 5{\cdot}4 \quad 5{\cdot}6 \quad 4{\cdot}2}$$ 0·9 mm.

It is proposed at a later date to publish detailed descriptions of the latter two species.