

indistinctly 2-segmented, the proximal segment about twice as long as wide, the second segment slightly longer than wide, rounded distally, provided with a few longer setæ at its ectal margins and more numerous delicate setæ at its medial tip (Fig. 3). Exopodite with third segment more than twice as long as broad, its distal spine heavy, about $\frac{2}{3}$ as long as segment 3, provided on each side with 6 stout tubercles which increase in size from proximal to distal end. Two long and several shorter setæ are inserted at ectolateral edge of segment 3 (Fig. 6).

Right leg similar to left, but differing as follows: basal spine shorter and slender; distal spine with a single row of 7 stout tubercles increasing in size as in the left leg.

Known from a single specimen infected with a larval trematode.

Type:—In the collection of Friedrich Kiefer, Karlsruhe (Baden) Karlstr. 128 (Germany).

Habitat:—Bangalore, South India.

Place of Collection:—Freshwater pond.

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August 2, 1941.

SULPHUR POSITION IN INDIA

I HAVE read with interest the article entitled "The Sulphur Position in India" by Sir S. S. Bhatnagar, Director, Board of Scientific and Industrial Research, which appeared in a recent number of *Current Science*.¹

It is really gratifying to note that the Board of Scientific and Industrial Research has diverted some attention to the question of recovery of sulphur from coal. Sir S. S. Bhatnagar has referred to the wakening (possibly also known as watching) coal of upper Assam and has indicated the organic nature of the sulphur compounds in that coal. He has also suggested that sulphur compounds might be extracted by solvent processes or by steam distillation; preliminary work has shown, however, that extraction by solvents is pretty difficult and

I think it is very doubtful if such extraction process can be carried out on a commercial scale and on an economic basis. Moreover, as a result of extraction by some organic solvents (I mention this from my experience), the caking property of coals is very much reduced, thus producing a deleterious effect on the coal residue. Though the sulphur content can thus be reduced to some extent, the residual coal may not be found suitable for manufacturing good coke.

It is fairly well known, that apart from consideration of sulphur content, many of the Upper Assam coals are considered to be of the highest grade metallurgical variety with minimum ash. Such coals with extremely low ash (sometimes as low as 1% or even less) are to be found nowhere else in India. Though by means of the extraction process, using organic solvents, some sulphur compounds may be leached out and recovered, the quality of the residual coal will be affected.

Sir S. S. Bhatnagar suggests, in the paper, that if the sulphur compounds can be removed by a cheap process from the coal, the coal itself will become more useful and a good price could be fetched by working the sulphur compounds. But he has not given any indication as to how such a process could be evolved.

It may be mentioned, in this connection, that a series of experiments with many high sulphur Tertiary coals of India were carried out by me for the quantitative determination of various sulphur forms in them.² In a paper³ communicated to the Indian Science Congress, I have indicated some methods for reducing the sulphur content of the coals of Upper Assam, and for producing high class metallurgical coke with permissible amounts of total sulphur. Blending of non-caking coals with caking ones are expected to solve the problem of unusual high swelling in some caking coals.

It was reported in that paper, that laboratory investigations had shown that a good proportion of sulphur compounds could be eliminated in the form of gases during the time of

carbonisation. These results are of interest to the Coal Industry. Experiments on a semi-industrial scale have to be carried out to see how far the laboratory methods might be successful in actual practice. The treatment of sulphur high coals with sodium chloride, hydrogen or cheap producer-gas in the carbonisation chambers erected for the purpose, is well worth investigation. This work may be taken up by the Board. The gaseous products thus obtained may easily be subjected to Thylox or any other suitable process for the recovery of the sulphur compounds. The coke residue in the chamber ovens will form a suitable product for high class metallurgical operations. In the case of non-caking coals the non-coherent residue in the ovens may be briquetted and used for steam raising purpose or can be blended with high swelling coals to give better results. The non-caking coals may also be profitably employed for blending prior to high temperature carbonisation. It has not been, however, yet possible to find out simple ways and means to reduce the sulphur content of the coals thereby making them suitable for use in lumps on the grates of boilers.

These aspects of the problem will perhaps be of interest to the members of the newly formed Sulphur Committee.

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¹ *Curr. Sci.*, 1941, 5, 245.

² *Quart. Jour. Geol. Min. & Met. Soc. of India*, 3, 101; 10, 135; 9, 157; *Proc. Nat. Inst. Sci. Ind.*, 6, 523.

³ *Proc. Ind. Sci. Congress*, Benares, 1941, Part 3, 138.

A MARGOSA TREE WITHOUT THE BITTER PRINCIPLE

I HAVE read with interest the brief note by Mr. Cherian Jacob on "A Margosa Tree without the Bitter Principle," published in the July number of *Current Science*.

On *prima facie* grounds Mr. Jacob's explanation seems sound. But it needs to be followed up. It should not be difficult, without appreciable damage to the trees, to cut out a block of wood deep enough to include portions of both the trees, to section it in order to confirm the presumed grafting of the tissues, and to ascertain the exact nature of the connection.

Assuming that there is an intercommunication between the saps of the two trees, several possibilities suggest themselves. It may be, as Mr. Jacob suggests, that the banyan's sap, passing into the margosa, exercises a neutralising influence on the bitter principle. On the other hand, it is possible that the bitter principle of the margosa diffuses into the banyan and may even render it bitter to the taste. A comparison of this banyan's sap with that of others is therefore indicated.

Natural fusions between plants of widely different affinities are not a rare occurrence. After all, parasitic connections such as that between a *Cuscuta* and its hosts (and it is notorious that these may belong to many different families) are to be counted among such natural fusions. It is probable, too, that grafting of tissues can be effected artificially between plants belonging to distant groups. What is worthy of enquiry is whether we can, by this means, improve the quality of fruits by eliminating undesirable flavours due to resins, latex and other substances.

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August 4, 1941.