

courtesy of Dr. Cerletti. The authors are grateful for these free gifts.

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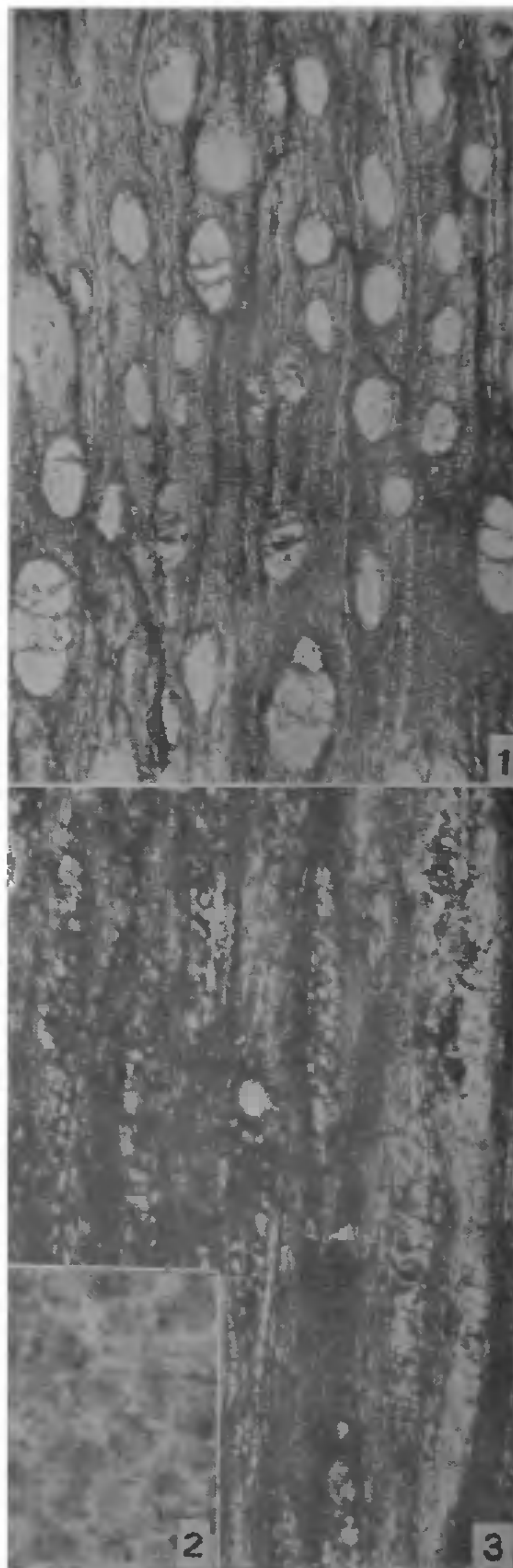
#### FOSSIL WOOD OF *LANNEA* FROM THE TERTIARY OF ASSAM

A NEW fossil wood belonging to the genus *Lannea* of the family Anacardiaceae is recorded here from a road cutting at milestone 9 on Dimapur-Diphu road in Mikir Hills, Assam. The fossil is represented by a small piece of decorticated secondary wood and shows the following characters:

**Growth rings** indistinct. **Vessels** small to moderately large, t.d. 75–230  $\mu$ , r.d. 120–340  $\mu$ , solitary as well as in radial multiples of 2–4 cells (Fig. 1), the solitary vessels round to oval in cross-section, sometimes elliptical, 7–11 per sq. mm.; vessel-members 180–360  $\mu$  long, truncate or with tailed ends; perforations could not be seen; intervessel pit-pairs large, 10–12  $\mu$  in diameter, bordered, alternate, border oval and angular due to crowding with linear-lenticular apertures (Fig. 2); heavily occluded with tyloses. **Parenchyma** scanty paratracheal, occurring as few cells about the vessels (Fig. 1). **Xylem rays** 1–7 (mostly 3–4) seriate, rarely with gum canals (Fig. 3); rays 6–8 per mm.; ray-tissue heterogeneous; rays heterocellular consisting of procumbent cells in the middle portion and 1–2 rows of upright cells at one or both the ends. **Fibres** moderately thick-walled with big lumina, septate, polygonal in cross-section. **Intercellular canals** horizontal, normal, confined to the xylem rays, 25–35  $\mu$  in diameter (Fig. 3).

A detailed examination of the modern woods with radial gum canals (Anonymous, 1963, pp. 264–323; Desch, 1957, pp. 6–29; Pearson

and Brown, 1932, pp. 309–347) indicate that the present fossil wood is closely allied to the



FIGS. 1–3. *Lanneoxylon grandiosum* gen. et. sp. nov. Fig. 1. Cross section of the fossil wood showing the vessel distribution,  $\times 43$ . Fig. 2. Magnified intervessel pittings,  $\times 850$ . Fig. 3. Tangential section of the fossil wood showing gum-canal in the xylem rays,  $\times 75$ .



modern genus *Lannea* A. Rich, especially to *L. coromandelica* (Houtt.) Merr. [Syn. *L. grandis* (Dennst.) Engler, *Odina wodier* Roxb., *L. wodier* (Roxb.) Adelb] (Raizada, 1958, p. 491). It also shows resemblance in gross features with the genera *Garuga* and *Boswellia* of the family Burseraceae. However, there are some important anatomical details which distinguish the present fossil wood from these genera. The present fossil wood from the Mikir Hills is, therefore, described here as *Lanneoxylon grandiosum* gen. et sp. nov.

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April, 11, 1967.

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### AN AMMOCOETE LARVA OF *ENTOSPHE- NUS LAMOTTENII* (LESUEUR) WITH AN ACCESSORY TAIL

AMONG some formalin-preserved larvæ of the lampreys (Cyclostomata) obtained from Mr. M. L. H. Thomas of the Fisheries Research Board of Canada, London (Ontario), one large ammocoete larva of the species *Entosphenus lamottenii* (LeSueur) was found to possess an accessory tail (Fig. 1). This additional tail was a well-developed, stout structure of

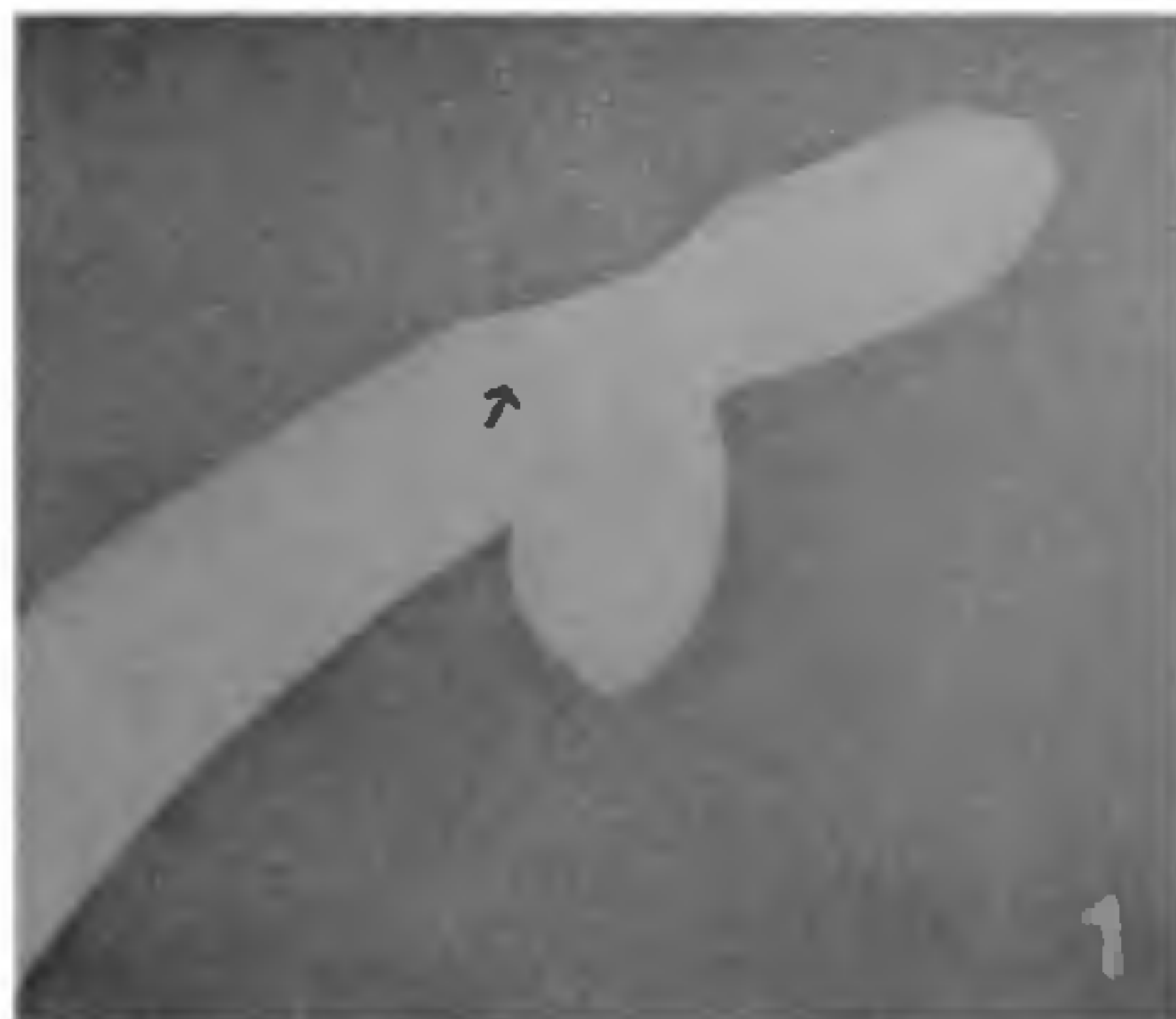


FIG. 1. The primary and accessory tails of an ammocoete larva of *Entosphenus lamottenii* (LeSueur). The tail was kept flat under a glass sheet while photographing. The arrow indicates the dorsal margin of the accessory tail at the point of its emergence from the primary tail.

normal shape and had arisen on the left side of the primary tail about 2/3 the distance from the cloaca. On sectioning, the accessory tail was found to be anatomically complete with a well-formed caudal fin, fin-rays, myotomes, spinal cord, notochord and blood vessels. The spinal cord and the notochord of the accessory axis were continuous with the corresponding organs of the primary axis at the point of origin of the former. The accessory axis had grown latero-posteriorly within the substance of the primary tail for some distance before emerging to become a full-fledged accessory tail with its own fin, fin-rays, myotomes, etc.

Earlier, Barfurth (1900) had also described an ammocoete larva of *Petromyzon planeri* with three tails, each of which was anatomically complete in all details. Such cases are of interest not only because they constitute animal curiosities but also because an analysis of the morphology of such forms can frequently serve as a guide to experimental work to elucidate the causative mechanisms involved in such development. Thus, speculating on the possible manner of production of three tails in one larva Barfurth had suggested that these animals might possess powers of regeneration and that some peculiar kind of injury followed by regeneration would have caused the formation of three tails from one. It is now known for certain that the larvæ of the lampreys do possess good ability to regenerate tail and the whole process is well understood (Niazi, 1963).

Experimental production of accessory tails has never been attempted in ammocoetes but it has been successfully achieved in urodeles and in the anuran larvæ. Success or failure of such attempts largely depends on the proper knowledge or otherwise of the roles which the different component tissues of the tail play in its morphogenesis and differentiation. In urodeles, the spinal cord is the key-component and is indispensable for regeneration. Mere deflection of the spinal cord in the urodeles to an angle away from its antero-posterior path in the tail causes the development of an accessory tail (Holtzer, 1956). In the anuran tadpoles on the contrary, proper morphogenesis of the tail depends on the notochord, whose presence is indispensable for regeneration of a normal tail. To produce an accessory tail in these tadpoles it is necessary that two or more centres of notochordal regeneration are established. The presence or absence of the spinal cord is said to be immaterial for tail regeneration in the tadpoles of frogs and toads