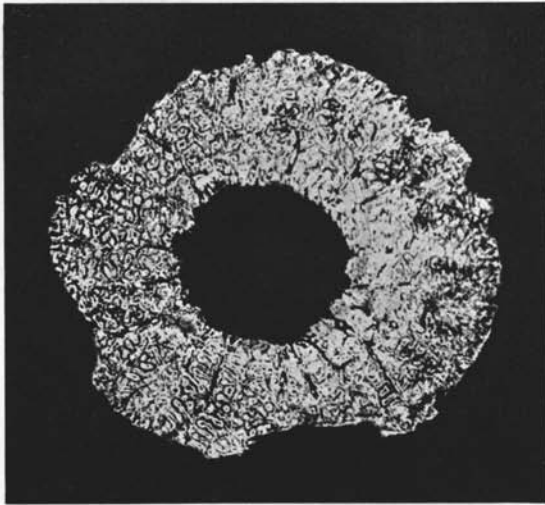
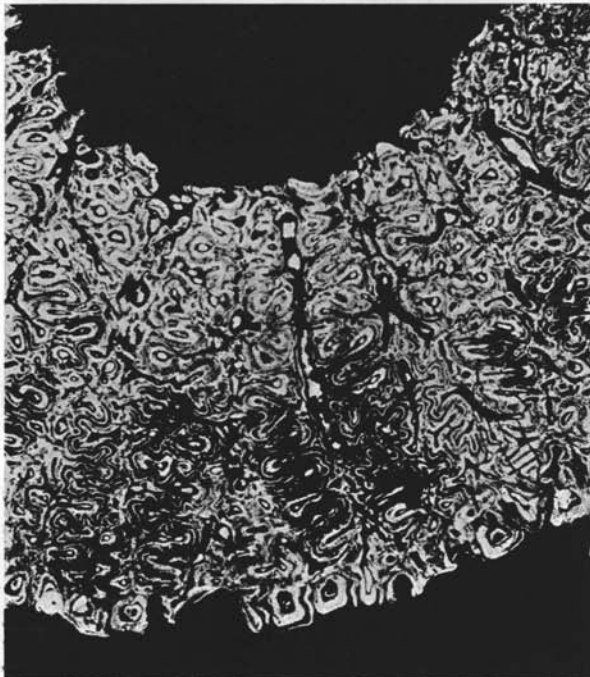


FIG. 1.



$\times \frac{1}{2}$



$\times 1\frac{1}{2}$

FIG. 2.

Transverse sections of a tooth of a Labyrinthodont reptile from the Upper Karroo Beds of Cape Colony.

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ORIGINAL ARTICLES.

I.—A LARGE LABYRINTHODONT TOOTH FROM THE UPPER KARROO
BEDS OF WONDERBOOM, NEAR BURGHERSDORP.

By Professor H. G. SEELEY, F.R.S., F.L.S., F.G.S., King's College, London.

(PLATE X.)

THIS vomerine tooth was found by Dr. D. R. Kannemeyer when resident at Burghersdorp. It is the only evidence of the dentition of the animal known, and is interesting as being of much larger size than any Labyrinthodont teeth hitherto found in South Africa, though smaller than the large teeth of *Mastodonsaurus giganteus* from the Keuper of Württemberg. Its presumed position on the palate is based upon the anchylosis of the tooth with a bone which shows a flat oblique suture at the base of the crown. This sutural surface is usual on vomerine teeth, and indicates that the tooth was directed downward, outward, and a little backward.

The base of the crown is closed and convex, and appears to be formed of dense tooth substance in which a labyrinthic structure is visible. On one side of the base there is a smooth surface, convex from above downward, concave from side to side, which is imperfectly preserved. This surface extends on to the palate, and is an indication of a vacuity, situated probably beneath an anterior nasal aperture. The bone about the base of the tooth projects all round it as a slight collar.

The tooth is broken transversely, $1\frac{1}{2}$ inch of the length of the crown is preserved in front, and little more than one inch on the hinder border. The total length to the base is about 2 inches. This may indicate, by approximation of the lateral curvatures, an original length of $2\frac{3}{4}$ inches. The base is transversely ovate, rather wider in front than behind, and rather more convex on the outer than on the inner side. But this irregular sub-triangular ovoid form is soon lost, and at the superior fracture the tooth is circular, with a diameter of more than half an inch.

The external surface is marked with close-set fine linear ribs, which are flattened and have a tendency to be gathered into bundles, by the grooves from time to time becoming deeper, especially in

the lower part of the crown, where the number of ribs is greater. They do not often show dichotomous division; but the ribs which rise from the base irregularly die away in the grooves. They have an appearance of being finer and more numerous in the lower part of the crown than at the transverse fracture, where they number about eighty. There is practically no enamel on the crown, which shows only a faint surface gloss. On receiving the tooth I had a cast made, and a transverse section was prepared so as to show the labyrinthic structure of the crown. The cut surface now has the appearance of being bordered at the circumference by close-set tubes which correspond to the external vertical ribs. Under the microscope these sections of the reed-like sheath of the tooth are mostly sub-quadrate, and hollow; separated from each other by a narrow band which passes inward and folds into the labyrinthic substance of the tooth. The centre of the crown of the tooth is occupied by the pulp cavity, nearly circular, slightly longer than wide; with a number of fine films at irregular intervals, radiating outward from it as vertical plates dividing the folded tooth substance.

The folding of the dentine is more complicated than in any genus yet examined. Counting from the inner border there are about twenty-five folded labyrinthic plates of dentine, which radiate to the circumference, without greatly varying in width. Each of these plates is made up of twelve or more alternate folds to right and left of the tooth substance, with each fold often plicated, and including spaces more or less small, frequently ovate, sometimes more elongated. The dentine is composed of tubes which show a radiating arrangement in harmony with the curvature of the folds. Each layer bears a thin film upon its external infolded surface which appears to correspond in position to enamel. This layer passes outward between the folds of dentine, and appears to extend over the external surface of the tooth, though most of the enamel is manifestly lost. Between the folded plates are a series of supplementary wedge-shaped folds, about half as numerous, which are continuous with the dentine of the plates on each side, sometimes by its being folded over on the one side, and connected by anastomosis on the other side.

The most distinctive features of the tooth are: (1) the external layer of vertical tubes of dentine; (2) the denseness of the folding of the dentine; (3) the connection of the folds with each other in ways different to those known in *Mastodonsaurus*; and (4) the number of small vacuities included in the folds of the dentine.

The only clue to the form of the skull is given by the small palatal vacuity, presumably palato-nasal, which descends upon the base of the tooth, and may be evidence that the skull was broad, depressed convex in front, with the nares in a forward position. The only genus with the skull of this type hitherto indicated is the imperfectly known *Batrachiosuchus* of Dr. R. Broom; but that type is far too small to have carried teeth of this size, which may indicate a skull twice as large, or about 18 inches long. The teeth in *Batrachiosuchus* are undescribed. I do not anticipate that it will prove referable to *Psychosphenodon* (GEOL. MAG., 1907, Dec. V, Vol. IV, p. 433), but it is from an animal equally large.

There are no grounds for generic definition at present, but the genus is probably undescribed. And in the absence of evidence of other generic characters than the dense folding of the tooth substance it may be sufficient to record the species as *Syphonodon thecomastodon*.

The photographs were made for me by A. Campion, Esq., in the Metallurgical Laboratory, Coopers Hill. The transverse section is enlarged four diameters and the segment is enlarged twelve diameters.

EXPLANATION OF PLATE X.

FIG. 1.—Transverse section of the summit of the crown of the tooth of the Labyrinthodont reptile *Syphonodon*, rather more than four times the natural size; broken on the margin in polishing.

FIG. 2.—A segment of a transverse section of the same tooth, about twelve times natural size, showing a few of the radiating plates of folded tubes of dentine. Externally a few of the close-set quadrate tubes are seen which form the sheath to the tooth and suggest the trivial name *thecomastodon*.

II.—ON SOME RECENT WELLS IN DORSET.

(PART II.)

By W. H. HUDLESTON, M.A., F.R.S., F.G.S.

(Concluded from the May Number, p. 220.)

II. THE BOVINGTON BOREHOLE.

FOR some years past the troops encamped at Bovington had to be content with such water as was supplied by a well a few hundred yards to the S.S.E. of the recently excavated borehole. The following particulars have been gathered respecting this well, but I cannot guarantee that in all respects they are strictly accurate. It was sunk in the Bagshot Beds about 1899, and is said to be 87 feet deep; the water-level stands at 82 feet from the surface, and the yield is 360 gallons per hour. The same Bagshot water-level was struck in the borehole. On comparing these two water-levels it is found that the one in the borehole stands at 85 feet above Ordnance Datum, whilst that in the well stands at 73 feet above O.D. This difference of 12 feet in a horizontal distance of 450 feet amounts to 1 in 37·5, showing a dip in the Bagshot Beds of $1\frac{1}{2}^{\circ}$ to the S.S.E. This may not exactly represent the direction of maximum dip, but there are good reasons for believing that the line of maximum dip of the Bagshots hereabouts is not far from S.S.E.

Since the War Office was not satisfied with the amount of water yielded by the well they bethought themselves of obtaining an artesian supply, and accordingly entered into a contract for the execution of a borehole, which was to be prosecuted to a depth of 600 feet, unless a good supply of water was reached at a less depth.¹ Ultimately the boring was continued to a depth of 726 feet, and the following is a record of the beds encountered:—

¹ The engineers employed were Messrs. Le Grand & Sutcliff. The operations lasted from July to November, 1906.