SOME NOTES ON THE POSSIBLE REPLACEMENT OF TEETH IN *GAVIALIS GANGETICUS*

WHERE there is a continuous succession of tooth formation in a jaw, the new teeth erupting in close proximity to its predecessors, as in some species of fish, the succession has sometimes been termed "endless", but it is doubtful whether there is the constant loss and replacement which is commonly supposed to occur.

Revolving of the tooth-bearing area is out of the question at any rate in crocodiles where, according to Richard Lydekker (1896), the teeth are confined to the margin of the jaw, replacement occurring rather at the base of a shed tooth and in the same position as that of the previous tooth.

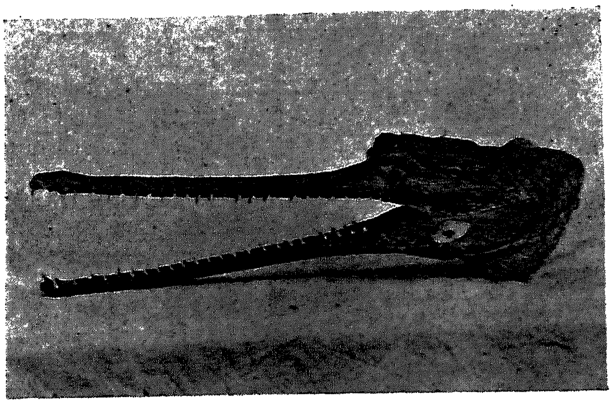
In *Gavialis gangeticus* the almost uniform spacing of the erupted teeth and the almost uniform size of many in a mature specimen shot by S. U. Nasmith in the Ganges does not support the belief that the teeth are at all commonly shed in this fish-eating species.

Although teeth may be missing or worn in old African crocodiles it is usual for the size of the teeth to correspond with the age of the individual which points to the conclusion that some at any rate are the original teeth and that only a few teeth have been shed and replaced during life.

There has been a tendency to apply human experience and what is known to occur in species with deciduous and permanent sets of teeth to all reptiles and it is even stated that the reserve teeth in a crocodile's jaw steadily push out the functional teeth, though dissection shows them independent in a hollow.

Although a new sharp tooth is usually visible at the place vacated by a shed tooth of a crocodile the phenomenon approaches that seen in the Mussel Crusher where some time elapses after a tooth is lost before the succeeding one appears, unlike the mammalian deciduous teeth whose shedding is hastened by osteoclastic action.

A successional tooth can be seen below the apex of many of the erupted teeth in a radiograph taken for me by Dr. Gordon Stewart of Durban but dissection of the *Gavialis* jaw would be necessary to determine how many exist below the twenty-nine teeth of the upper and the twenty-five teeth of the lower jaw.



Head of a twelve-to-thirteen feet specimen of *Gavialis gangeticus* shot by S. U. Nasmith, average length of exposed portion of tooth being approximately half an inch.

Experimental proof would be cruel and misleading but I have seen no sign of the apparently vestigial remains of teeth in crocodiles which I have sometimes noted in the hindermost rows of teeth in some sharks and fishes.

There can be no question that all crocodiles die with many of their reserve teeth unerupted and that, although these buried teeth serve for possible replacement when a functional tooth is lost, the production of teeth is excessive for their present needs.

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February 2, 1943.

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PIGEONITE IN THE "ABNORMAL" DOLERITE DYKES OF CHARNOCKITIC AREAS IN MYSORE

CERTAIN "abnormal" dolerite dykes from the Biligirirangan Hills have been described by Mr. B. Rama Rao, Director of Geology, Mysore Geological Department. He describes the pyroxenes of these dykes as "pink to purplish, schillerized augite", elsewhere as "purplish to pinkish titanaugite."[1]

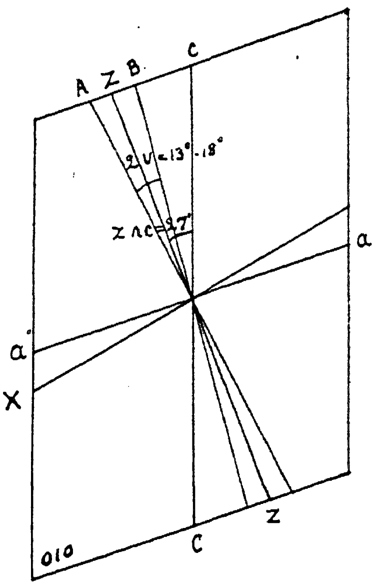
Dykes of a similar type have been noticed near Halagur and Dodkanya, two other Charnockitic areas in Mysore. The dykes traverse the general foliation of the gneisses with a rough east-westerly trend. Microsections of specimens of the dyke show plagioclase laths and pyroxene plates disposed in a sub-ophitic texture; in other specimens the pyroxenes cluster in glomeroporphyritic groups with an occasional felspar lath entangled between them, which, in ordinary light, imparts to the rock on ophitic texture; the interspaces between the glomeroporphyritic groups are intergranular with felspar laths; at other times, the interspaces have intersertal chloritic or amphibolic material between the felspars, imparting to the whole rock the "ophimottling" or "poikilophitic" texture.

The felspars are dusted with dark dotted inclusions mostly with a clear outer rim; they are twinned on the Albite Law, the most common type being oligoclase, and the most basic type being andesine; there are occasional crystals of microline, and of orthoclase twinned on the Baveno Law; some well-zoned crystals are also present.

The pyroxenes are purplish, showing characteristic pyroxene cleavages, most of then have kelyphytic borders, but clearer interiors. The kelyphytic borders show a brownish rim which passes outside into a greenish border, that crystallizes into an amphibole of the sodic type (with the tinge of lavender blue parallel to the Z axis) or at other times, into the brownish blue amphibole of the charnockitic type. The blue tufts in the reaction rims pass sometimes into scales of reddish brown biotite, when appear concomitantly, in the felspars, epidote and sillimanite needles. The interstitial substance bordering the sodic blue reactions are clear albite; vermicular intergrowths between albite and plagioclase (perthite), simulating micrographic texture, and intergrowths between pyroxene and felspar are often seen. The blebs of clear albite suggest sodic infusions.

The pyroxene of the dyke is a Pigeonite. It shows a small optic axial angle varying from almost uniaxial to $2V = 13°$ and $18°$. Optic sign is +ve. Contact twins on (100) are very common, strain shadows, splitting isogyres, in successive lamellæ, are observed in a (100) section.

$Z \wedge c = 27°$ in the obtuse $\angle \beta$. Positive elongation. BX_{ac} nearly $\perp r$ to c(001). XZ is || to 010, and bisects the acute prismatic angle. $(\gamma - \alpha) = \cdot 020$. In pleochroic varieties X = pink, Y = brownish pink, Z = pale green. The parallelism of the optic axial plane to (010) points to the Mysore Pigeonite as a calcic variety.[2]



Pigeonite from Mysore

$2V = 13° - 18°$, + ve.

$N_g - N_p = \cdot 020$

$Z \wedge C = 27°$, XZ || 010

Positive elongation

X = Pink.

Y = Brownish pink.

Z = Pale green.

Pigeonite from the granulites of the Charnockite series has been described by Dr. Groves.[3] He notes the predominance of the clinoenstatite-clinohypersthene molecule in the Pigeonites of Uganda and assigns them to the diopside-hedenbergite series. Similar hypersthenes in the Mysore Rocks of Charnockitic affinities are under investigation. The pigeonite, however, referred to in this note, occurring in the "abnormal" *dolerite* dykes (showing poikilophytic texture), is of the enstatite-diopside series. Computed from Winchell's variation diagrams, this pigeonite has a composition 3 Ca Mg Si_2O_6 2 Mg Mg Si_2O_6. Since the presence of the ophitic texture and microperthitic texture point towards eutectic proportions, a volumetric estimate was made of the proportions of Pigeonite to Plagioclase present in the rock, yielding the ratio 60 : 40.

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March 19, 1943.

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PROTEINS AND BLOOD FORMATION

The customary methods of estimating the nutritional values of proteins depend upon comparing their relative efficiencies in the maintenance of nitrogen equilibrium. This is unavoidable in the present state of our ignorance concerning the specific functions in metabolism of individual amino-acids. One of the most important functions of nitrogenous food in the growing as well as in the adult animal must be the regeneration of hæmoglobin. The red blood cells undergo continuous destruction in the body, the hæmoglobin being first broken down into protein and prosthetic group and the hematin then converted into bilirubin. If as is usually assumed the average life of an erythrocyte is three weeks about five per cent. of the total hæmoglobin present in the blood must be regenerated every twenty-four hours. Part at least of the nitrogen required for this purpose must be of exogenous origin in view of the known excretion of the bile pigments in the urine and fæces and the fact that hematin administered as such by injection cannot be utilised for hæmoglobin formation.

There are, however, very few investigations on the relative value of proteins with reference to their ability to promote blood formation. Hart[1] *et al.* studied the relation of proteins to hæmoglobin formation using as experimental material rats suffering from severe nutritional anæmia resulting from an exclusive milk diet. This procedure is, however, open to the criticism that this type of anæmia is not the result of protein deprivation but of iron deficiency and the curative effect cannot be ascribed definitely to protein ingested during the period under test. Recently it was shown in this Laboratory (Yeshoda, 1942)[2] that rats made anæmic by means of phenylhydrazine provide convenient objects for the study of the hæmopoietic action of substances. Phenylhydrazine under the conditions employed produces severe anæmia without causing other adverse effects and the animal has its R.B.C. count and hæmoglobin reduced to about half the normal value