The Blastocoelic and Enteric Cavities in the Amphibia.

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With 3 Text-figures.

There has long been doubt and controversy concerning the origin of the cavity of the endodermal gut in the frog, and its relation to the so-called 'segmentation cavity'. In a paper published in volume 67 of this journal Professor Meek (1) showed that in his specimens of Rana temporaria the 'segmentation cavity' becomes confluent with the enteric cavity formed by invagination and ingrowth. But, although he distinguishes a 'primitive enteron' from a 'secondary enteron', and states that the ordinary nomenclature of the cavities is wrong and misleading, Professor Meek does not make it quite clear what general morphological interpretation should be applied to the facts.

Messrs. Narayana Rao and Ramanna now bring forward in this volume (2) evidence of the confluence of the 'archenteron with two segmentation cavities' in the Engystomatid frogs.

It is, therefore, in the hope of clearing up the matter that I offer in this note an interpretation which seems to make it possible to compare the gastrulation of the Anura on the one hand with that of Amphioxus, and on the other with that of the Reptilia, and to reconcile our account of these three types of development. The interpretation proposed is illustrated in the Text-figs. A–C.

The chief difficulty seems to be due to the term 'segmentation cavity' having been applied to a space in the yolky endoderm of some Anura, and on the assumption that it forms part of the true cleavage cavity or blastocoel. This difficulty disappears if the cavity in question (yc, Text-figs. A–C) is considered to represent fluid yolk, or, so to speak, liquid endoderm filling a space in temporary continuity with the true blastocoel (bl). The liquid may gather to form one cavity as in Rana, or two
as in the Engystomatids; and its confluence with the remains of the blastocoel situated between the ectoderm and the endoderm may be held to be, as it were, accidental and of no morphological significance. Further, these cavities in the yolk may be compared to the small intercellular spaces described by Kerr in Lepidosiren, to the larger spaces among the yolk-cells described by Brauer in Hypogeophis, and to the still larger 'subgerminal' cavity in Reptiles—all of which may contribute to form the cavity of the gut. These embryonic cavities more or less completely enclosed in the endoderm

**Text-Figs. A, B, and C.**

Diagrammatic sagittal sections of three successive stages in the gastrulation of the egg of an anuran. The endodermal area is shaded. *Bl*, blastocoel; *dl*, dorsal lip of blastopore; *e*, enteron; *vl*, ventral lip of blastopore; *yc*, yolk cavities filled with 'fluid endoderm'; *yp*, yolk-plug in blastopore. In C the yolk-cavities have become confluent with the enteric cavity formed by ingrowth, and so contribute to the lumen of the gut.

should not, therefore, be called blastocoelic, nor even 'segmentation' cavities, since this name is often taken to be synonymous with blastocoelic. They belong to the endodermal area, and the terms endodermal or yolk-cavities may be applied to them. The true blastocoel is sooner or later obliterated between the ectoderm and the endoderm in Amphibia as in other vertebrates.

**List of References.**