analyse variations rapidly by cytological technique, which could only be detected by the experimental breeder with considerable difficulty.

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Embryo Sac and Embryo of *Moringa oleifera*, Lamk.

THIS plant was first investigated in 1923 by F. L. Rutgers[1], who makes some astonishing statements regarding the development of the embryo sac and embryo. He states that the archesporial cell is deep-seated in the nucellus, and functions directly as the megaspore mother cell without cutting off any parietal tissue. This on reduction gives rise to a T-shaped tetrad of megaspores of which the lower produces a 5-nucleate embryo sac. He further remarks that the fertilised egg undergoes several free nuclear divisions and wall-formation starts only after sixteen nuclei have been formed.

As my results are very different from these, I think it worth while to record them briefly.

The young nucellus usually shows a single hypodermal archesporial cell. This cuts off a primary parietal cell which by further divisions forms three or four wall layers. The megaspore mother cell divides in the usual manner to form four megaspores which may either be arranged in a single linear row or in the form of a T.

Embryo Sac. The nucleus of the functioning megaspore divides three times to form a normal 8-nucleate embryo sac. The antipodals are ephemeral, but in some cases they may persist for quite a long period. In the former case an older embryo sac would appear to be only 5-nucleate, and it is just possible that Rutgers based his conclusions on the observation of such embryo sacs.

In some cases, two embryo sacs were present within the same nucellus, and in one case I saw two paired nucelli each with its separate inner integument, but with a common outer one. Many irregularities exist in connexion with the total number of nuclei in the embryo sac. In several cases the egg apparatus was seen to contain four or even five cells. The number of free nuclei in the middle of the embryo sac was found to vary from 2 to 6.

Endosperm and Embryo. The primary endosperm nucleus divides rapidly forming a mass of nuclei specially crowded at the micropylar end. In poorly fixed material some of these nuclei become arranged in such a way that the whole body appears to be a free-nucleate egg. A careful study of serial sections reveals, however, that the fertilised egg is situated just above this mass of nuclei and divides much later. The first separating wall is transverse, as in other Angiosperms. The upper cell divides to form a massive suspensor. The mature embryo is dicotyledonous, but in some cases it may become tricotyledonous due to a split in one of the cotyledons.

I wish to express my sincere thanks to Dr. P. Maheshwari for guidance and suggestions throughout the course of this investigation. I am also grateful to Prof. K. Schnarf, of Vienna, who took the trouble of examining some of my slides and confirmed my observations.

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Structure of the Caudal Fin of the Cod

As the cod is a type commonly dissected by students in zoological laboratories, may I point out an error which still occurs even in the latest textbooks concerning the structure of the caudal fin of this fish?

Textbooks assert that there is something peculiar about the tail fin of the cod and other Gadidæ, and state that it is symmetrical both externally and internally. It is also stated that the Gadidæ do not pass through a heterocercal stage in development. Hence the fin is described as 'isocercal', 'diphycercal' or 'pseudocercal', and in fact this alleged diphycercy has led to conclusions of great importance such as phylogenetic relationship and the composition of the present fin.

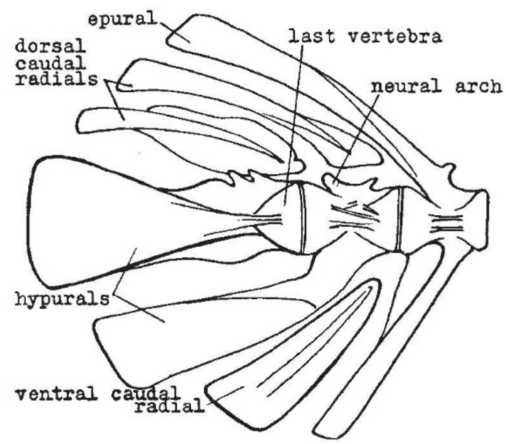

FIG. 1. Skeleton of the caudal extremity of the cod.

However, I merely invite the attention of teachers of zoology to the accompanying sketch (Fig. 1) of the extremity of the caudal fin skeleton of the cod, from which they can draw their own conclusions. It can be easily verified by dissection and clearing in xylol. It is scarcely possible to call the fin anything else but homocercal, as in the majority of Teleosts. There is clearly nothing peculiar whatever about the structure. Moreover, in *Gadus minutus* at least, and doubtless in every other Gadid, a heterocercal stage is very obvious in specimens one inch long.

An exactly similar error appears constantly in regard to the caudal fin of the eel, which is also homocercal. For those interested, I venture to direct attention to my previous papers on caudal fin structure in fishes[1].

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