Par contre si, comme les souris normales, les souris obèses hypothalamiques réagissent au jeûne par une augmentation de la cétonémie, les souris héréditairement obèses réagissent au jeûne par une diminution de la cétonémie, une réaction qui peut s'ajouter à celles qui différencient les obésités «de métabolisme» des obésités «de régulation».

Nuclear Chimaeras in the Newt

Direct tests as to whether the cell nuclei of various tissues differ in their developmental capacities have been made recently by BRIGGS and KING. These authors developed a technique for the transplantation into frog oocytes of somatic nuclei from embryos of various stages. The recipient oocytes are first enucleated and artificially activated, and the degree of development they reach after nuclear transfer shows the capacity of implanted nuclei to carry the oocyte cytoplasm towards normal differentiation. The above authors have reviewed their investigations recently[1]; whilst blastula nuclei, including nuclei from the dorsal lip of the blastopore, are capable of bringing about the normal development of enucleated oocytes, endoderm nuclei from late gastrula show definite signs of differentiation in that a high percentage of them are incapable of effecting development beyond the gastrula stage.

It has been found difficult to carry out parallel investigations with the oocytes of newts, as these cannot become artificially activated and are normally polyspermic. Attempts made so far[2] involved substantial modifications of the BRIGGS and KING procedure, and the results have not been entirely satisfactory.

It might be of interest to record here a further experiment carried out on *Triturus alpestris* material.

A group of 2 to 4 somatic nuclei were transplanted into a normally fertilized and non-enucleated egg. As a result, this egg carried its normal zygotic nucleus as well as the donor nuclei. It was hoped that the hosts would develop to a more or less advanced stage, at which it would be possible to observe whether the donor nuclei are able to participate in tissues derived from all three cell layers or only in tissues derived from the cell layer of their origin.

To make identification of implanted nuclei possible, haploid embryos were used as donors. These were produced by Dr. G. G. SELMAN of this Institute, who treated *in vitro* newly collected sperm with ultraviolet light of 2100–3200 Å for 1·5 to 3 min. The sperm was then smeared onto oocytes collected from the oviduct. The donors were checked for haploidy by chromosome counts on squashes from a piece of tissue.

The host eggs were left to develop after the nuclear transfer. Sixteen were fixed at the early neural plate stage, sectioned and stained with Feulgen for chromosome counts. The remaining failed to develop normally beyond the early neural plate stage, became abnormal and finally cytolysed.

Examination of the 16 specimens fixed showed that no haploid nuclei could be seen in 5; but several haploid (donor) as well as diploid (host) nuclei were found in each of the remaining 11. Of these 11, 7 had received haploid ectodermal nuclei from the neural plate itself of donor embryos whilst 4 had received nuclei from the chorda mesoderm of the same donors.

It is interesting that, in almost all of the eleven cases, nuclei of donor origin were found in all three cell layers. Thus, not only the embryos as a whole but also each cell layer were nuclear chimaeras, containing nuclei of two distinct origins and chromosome complements, within cytoplasm of one origin.

Sizes of adjacent haploid and diploid cells were markedly different. Incidentally, several tripolar spindles and aneuploid nuclei were also observed.

It follows that at the definite neural plate stage, the nuclei of the mesoderm and the neural plate itself are all capable of organizing cells of any cell layer and are not differentiated at least in this respect. As all hosts failed to complete development, it cannot be decided whether these nuclei differ in their capacity for further tissue differentiation.

In another series, ectodermal nuclei from the neural plate of diploid hosts were transplanted into haploid donors. This series is of less interest than the first one because the nuclei of haploid hosts might be expected in some cases to become diploid and thus be confused with donor nuclei; furthermore, haploid embryos are expected to be more prone to abnormalities. Nine hosts were fixed in this series, 7 as gastrulae and 2 as blastulae. In 3 no reliable chromosome counts could be made. Again, haploid and diploid cells were found in all cell layers of the other four.

As already indicated, the recipients that were not fixed at the early neural plate stage developed abnormalities and cytolysed soon afterwards. It is hoped however that these abnormalities might be avoided or delayed in further tests by: (a) implanting one donor nucleus only instead of a cluster of 2 to 4, and (b) grafting tissues from the chimaeras onto healthy normal embryos, where these tissues might differentiate further.

We wish to thank Professor C. H. WADDINGTON for his interest in this work and Dr. G. G. SELMAN for producing the haploid embryos used. We are thankful to the Melville Trust (E.M.P.) and the Royal Commission for the 1851 Exhibition (J.J.) for Research Fellowships.

E. M. PANTELOURIS and J. JACOB

Institute of Animal Genetics, Edinburgh, October 28, 1957.

Zusammenfassung

Gruppen von 2–4 somatischen Kernen haploider *Triturus*-Embryonen wurden in diploide, ungefurchte Eier injiziert. 11 haplo-diploide Mosaik-Larven entwickelten sich bis zum frühen Neurula-Stadium. Nachkommen von Kernen aus dem neuralen Ektoderm oder Chorda-Mesoderm von Spendern im Neurula-Stadium fanden sich in allen drei Keimblättern der Wirtslarve.

The Temporary Inactivation of Newt Larvae by Benzimidazole and its Alkyl Derivatives

Benzimidazole and some of its derivatives, produce muscle relaxation in mammals, apparently by their action on the central nervous system[1]. The experiments

[1] T. J. KING and R. BRIGGS, Cold Spring Harb. Symp. quant. Biol. *21*, 271 (1956).

[2] H. E. LEHMAN, Biol. Bull. *108*, 138 (1955). – C. H. WADDINGTON and E. M. PANTELOURIS, Nature *172*, 1050 (1953).

[1] L. GOODMAN, A. GILMAN, and N. HART, Fed. Proc. *2*, 80 (1943). – L. GOODMAN and N. HART, Fed. Proc. *3*, 73 (1944). – E. G. DOMINO, K. R. UNNA, and J. KERWIN, J. Pharmacol. *105*, 486 (1952).