The formation of flagella, or at least their functioning in *C. reinhardi* is genetically determined. A number of mutants with paralysed flagella were studied[3], and it was found that the respective genes are localized at least in 7 chromosomes. Therefore it is necessary to pay more attention, in particular, to the mechanisms of induction and repression of flagellum formation from the viewpoint of the control mechanisms manifesting themselves at the level of genes and to look for other possible regulation mechanisms which could play an important role in this process.

Zusammenfassung. Die Induktion der Geisselbildung bei *Chlamydomonas reinhardi* ist im flüssigen Medium durch höhere Konzentrationen von NH_4NO_3, KNO_3 und NH_4Cl gehemmt.

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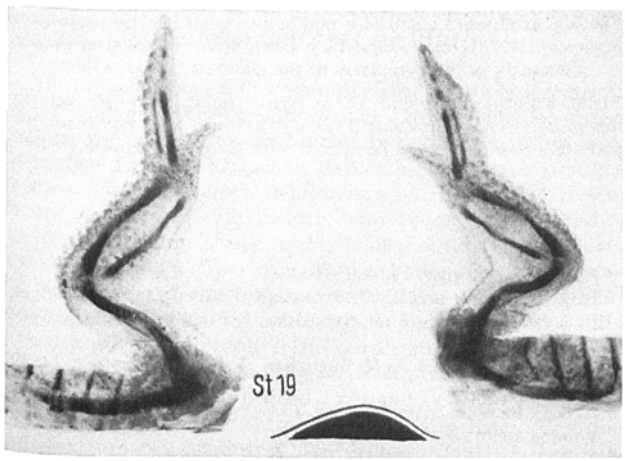
On the Regulative Capacity of the Chick Embryo Limb Bud

Previous research (Hansborough[1], Amprino and Camosso[2]) has shown that excision of about 50% of the mesoderm and ectoderm from the central region of the chick embryo limb bud can be fully compensated. An even higher regulative capacity was observed by Zwilling[3] and by Hampé[4] under special experimental conditions: a complete limb may develop from a limited proximal, or respectively distal, portion of the early limb bud mesenchyme associated with an intact ectodermal cap.

In experiments carried out with the aim of analyzing the mechanisms of regulation at the cellular level, a large 'window' was opened in the wing bud by removing a large part of its mesoderm and of the covering dorsal and ventral ectoderm; only the material of the base proper, a marginal strip of mesoderm 10 to 12 layers of cells thick (histological control) and a narrow band of the overlying ectoderm including the apical ridge was preserved. In the inset of the Figure, the removed part of the bud is shown in black. The operations were made in stage 18 to 20 of the chick embryos.

A complete wing developed in a significant percentage of the embryos in which as much as 85 to 90% of the wing bud material had been excised. Various degrees of skeletal deficiencies occurred in about three-quarters of the embryos operated on in each stage. In the more defective cases the arm did not form, the forearm was poorly developed and the hand variously defective. In a quarter of the embryos of each stage the wing operated on was normal and often its size was equal to that of the normally developing contralateral wing (Figure).



11-day embryo, Lundvall staining. Removal of 90% of the wing bud at stage 19. Complete regulation in the operated limb (right).

According to Saunders et al.[5,6] 'a complete wing will form after excision of the distal two-thirds or more of the wing mesoblast, provided the apical ridge of the bud is pressed into contact with the remaining proximal wing tissues'. The precise extent of the excision is not reported in the papers quoted, but it appears (personal communication) that in Saunders' et al. experiments the portion of the wing bud mesoderm left *in situ* was comparatively larger than in the present experiments.

From the maps of the prospective territories of the wing bud (Saunders[7], Amprino and Camosso[8]), it appears that in our operations the mesenchyme which gives rise to the humerus and to a limited portion of the girdle was probably removed in stage 18 and 19 embryos, the proximal part of the forearm and the arm in stage 20 embryos; the territories mentioned are already individuated at the stages in which the operation was made. The thin marginal layer of the mesenchyme which was left *in situ* may represent the material from which the forearm and the hand arise in successive stages.

Notwithstanding the huge gap opened in the bud, the removal of prospective material thus barely exceeded (and respectively the regulation involved more than) one segment of the prospective wing; this may explain the development of a complete wing in a number of cases.

Zusammenfassung. Wenn bei Ablation von 90% des Materials der Flügelanlage von Hühnerembryonen der Stadien 18–20 eine dünne Marginalschicht des Mesenchyms und des deckenden Ektoderms *in situ* bleibt, erhält man in einem bedeutsamen Prozentsatz der Fälle eine vollständige Regulierung.

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