These fractions were obtained from liver homogenates, prepared with a Potter-type homogenizer and centrifuged at a low speed to remove 'debris' containing the nuclei, by further centrifugation for 20 min. in an 'Angle 13' (Measuring and Scientific Equipment, Ltd.) centrifuge at 12,000 *g* (maximum value, at extreme tip of tube). The particles were suspended in 1·8 *M* sucrose solution and counted under dark-ground illumination as described by Allard *et al.*[3]. Under these conditions (in 1·8 *M* sucrose) the particle size-range is decreased (compressed); all visible particles up to and including the mitochondrial size-range were counted.

The study included hypophysectomized albino male rats of about 200 gm. weight, some of which had received daily injections of 0·3 mgm. of pituitary growth hormone (presented by Armour and Co., Chicago) for eight to twelve days. The effect of adrenalectomy was also studied, with albino females of about 250 gm. weight, given saline in place of drinking water. The rats were arranged in groups, such that the experimental rats were compared with control rats (intact or sham-operated) which had been kept on the same food intake, and which were killed on the same day after an overnight fast.

As shown in Table 1, there was a marked increase in 'large-particle number' with hypophysectomized rats given growth hormone. The absence of any significant change with untreated hypophysectomized or adrenalectomized rats suggests that there may be some pituitary hormone, other than adrenocorticotrophin, which has an influence converse to that of growth hormone on particle number. As reported elsewhere[1], hypophysectomy or adrenalectomy slightly diminishes the weight yield of the 'large-particle' fraction, and on administration of growth hormone to hypophysectomized rats the weight yield shows an increase which is, however, considerably smaller than the increase in number now reported.

Table 1. PARTICLE COUNTS ON 'LARGE-GRANULE' FRACTIONS ISOLATED FROM RAT LIVER

Hormonal status*	Particle number†, as per cent of that for control rats studied simultaneously (values calc. as No./100 gm. body-weight)
Hypophysectomized	123 ± 17·5 (n = 5)
Hypophysectomized + growth hormone	371 ± 25·7 (n = 6; P < 0·1%)
Adrenalectomized	116 ± 39·0 (n = 5)

* Operated animals were killed two to three weeks after operation.
† Mean ± stand. error; n denotes number of observations, and P the probability that difference from controls could be due to chance.

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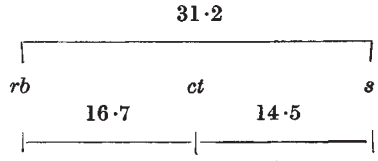
The Hypothesis of Chromosomal Interference

IT has been known for a long time that both chromatid and chromosomal interference produce similar effects on recombinations recovered in classical genetical (Mendelian) analysis in which single chromatids are sampled. Although deviations from a unitary coincidence are probably due either to chromatid or chromosomal interference, the classical method does not permit one to determine whether one or the other, or both, processes are effective in producing the deviations. It is strange, therefore, that chromosomal interference has been the accepted explanation of non-unitary coincidence since the very beginning of modern genetical analysis. The utility of either hypothesis in the analysis of single-chromatid experiments may be demonstrated by considering the following map:



The expected frequency of double-recombinations would be 16·7 × 14·5 × 10^{-4}, or 2·4 per cent, whereas the actual frequency is only 0·9 per cent. The accepted conclusion has been that one cross-over actually interferes with the occurrence of another, the 'strength' of this interference being indicated by the coincidence value (in this case, 2·67). The hypothesis of chromatid interference is, however, equally applicable if one supposes that adjacent cross-overs form four-strand double exchanges at a frequency equal to or greater than 72 per cent.

Tetrad analysis provides an opportunity of discriminating between these two types of interference. The only positive data on this subject may be summarized as follows.

(1) Negative chromosomal interference exists in *Neurospora*[1], that is, the presence of one cross-over 'facilitates' rather than inhibits the occurrence of another.

(2) A mapping function which assumes a Poisson distribution of the number of cross-overs has produced additive distances in the otherwise non-additive recombination data in yeast, indicating that cross-overs occur independently of one another in these regions (C. C. Lindegren and E. E. Shult, to be published).

It is clear from these findings that the existence of chromosomal interference has been neither demonstrated nor proved.

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