

# IDENTICAL LOCI AND RELATIONSHIP

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## 1. Introduction

I shall call identical loci, two loci bearing genes identical by descent; that is, going back to the same locus of one common ancestor.

If we consider one diploid individual called  $K$ , his two homologous loci may be identical if he is “inbred”; that is, if his two parents  $I$  and  $J$  have some common ancestors  $A_i$  (figure 1).

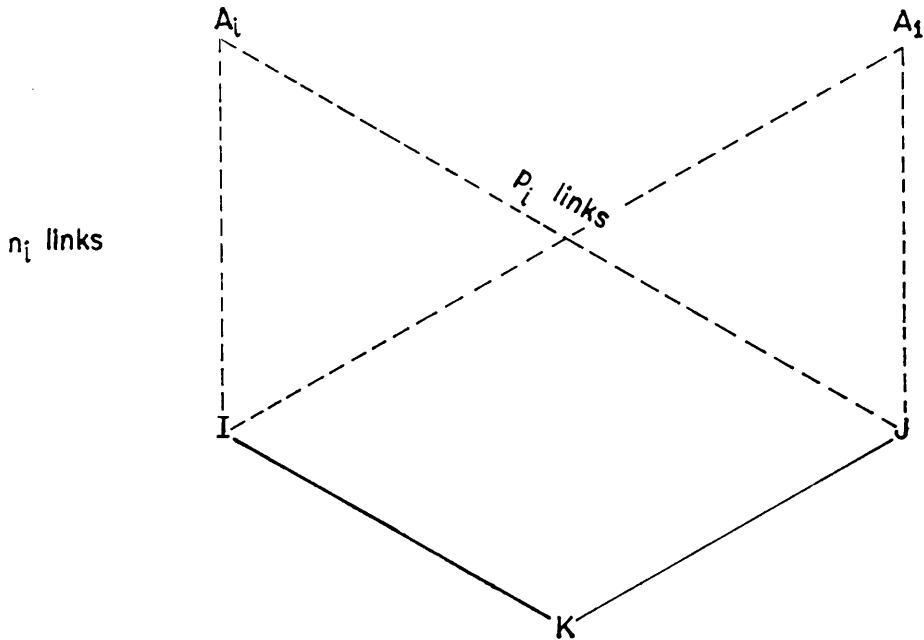


FIGURE 1

Example of identical loci due to common ancestors.

The probability of identity of his two homologous loci is named his *coefficient of inbreeding*  $f_K$ ,

$$(1.1) \quad f_K = \sum_i \left(\frac{1}{2}\right)^{n_i+p_i} \frac{1}{2} (1 + f_{A_i}),$$

where  $A_i$  are unrelated ancestors. It is remembered that  $1 - f_K$  is the probability