

71. Probability-theoretic Investigations on Inheritance. XI₁. Absolute Non-Paternity.

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1. Absolute non-paternity.

In several preceding chapters¹⁾ we have discussed the problems of proving non-paternity exclusively on the supposition that an inherited character of mother has been known as well as that of her child or those of her children. A fundamental postulate has accordingly based on a fact that any type not able to produce with her a child in question can never belong to a true father. Hence, the problems are, so to speak, those relative to a type of mother.

On the other hand, there are cases where non-paternity proof is possible *without* taking a type of mother into account; namely, there exist pairs of types which can never belong to father and his any child. Non-paternity will then be established *absolutely*, i.e., with no regard to a type of mother.

If non-paternity proof is possible absolutely, then it is, of course, also possible relatively to a type of mother. Hence, any probability of proving absolute non-paternity does never exceed the corresponding one of proving relative non-paternity.

We now begin with a problem stating that: *Given a child and a man, at how many rate the non-paternity proof can be absolutely established?* Let a type of a child be A_{ij} and that of a man be A_{hk} . The absolute non-paternity can be verified if and only if there exists no common suffix between i, j and h, k . Since it is the same to

1) Y. Komatu, Probability-theoretic investigations on inheritance. I. Distribution of genes; II. Cross-breeding phenomena; III. Further discussions on cross-breeding; IV. Mother-child combinations; V. Brethren-combinations; VI. Rate of danger in random blood transfusion; VII. Non-paternity problems; VIII. Further discussions on non-paternity; IX. Non-paternity problems concerning mother-children combinations; X. Non-paternity problems concerning mother-child combinations. Proc. Jap. Acad. **27** (1951), I. 371-377; II. 378-383, 384-387; III. 459-465, 466-477, 478-483; IV. 587-592, 593-597, 598-603, 605-610, 611-614, 615-620; V. 689-693, 694-699; **28** (1952), VI. 54-58. VII. 102-104, 105-108, 109-111, 112-115, 116-120, 121-125; VIII. 162-164, 165-168, 169-171; IX. 207-212, 213-217, 218-223, 224-229; X. 249-253, 254-258, 259-264. These papers will be referred to as I; II; III; IV; V; VI; VII; VIII; IX; X.