13. *Probability-theoretic Investigations on Inheritance. VI. Rate of Danger in Random Blood Transfusion.*[1)]

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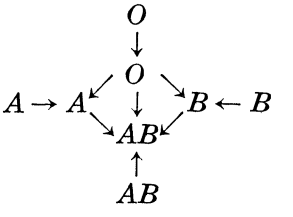
1. Preliminaries.

We insert here a short chapter concerning the rate of accidental danger in *blood transfusion*, especially in case of *random selection*. In view of the nature of problem, we concern exclusively the concrete human blood types alone. Now, it is one of the most important applications of blood types to clinical medicine, to make possible to choose a suitable type of donor in blood transfusion. That the blood transfusion shows a restoring effect against profuse hemorrhage of various kinds, has been well verified by many experiences. But, in order to ward off an accompaniable danger, it is necessary to choose a suitable donor possessing the blood-corpuscles not agglutinated as well as not dissolved by serum of the receiver. If, in future, the system of blood transfusion company or blood bank, where the blood of every type is preserved, will perhaps spread more wider, then the mistake on choice of suitable donor will be warded off. But, in an imminent case, it may possibly happen that there is no time sufficient to examine the blood type.

Let a pair of a donor and a receiver be chosen, one or both of which have unknown types. Then, at how many rate the danger will be expected? In the present chapter, we shall chiefly discuss the problem in case of ABO blood type. The safe directions of transfusion fitting for the above-mentioned postulation may be, as well known, denoted in the scheme.



Besides the postulate mentioned above, it is practically further desired that the serum of donor does not agglutinate or dissolve the blood-corpuscles of receiver. For that purpose, it will be safe to choose a transfused blood obtained, if necessary, by removing anti-A or anti-B agglutinin. However, we shall not touch here on such a circumstance.

1) In reference to preceding papers, cf. a foot-note of Y. Komatu, Probability-theoretic investigations on inheritance. V. Brethren combinations. Proc. Jap. Acad. **27** (1951).