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**Further observations on "rough" and "smooth" strains of bacteria.**

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In a previous paper<sup>1</sup> it has been shown that single-cell strains of paratyphoid bacilli of the R and S types can be converted one into the other by suitable treatment. The S type so obtained is more stable in salt solution and more virulent than the corresponding R type, and also possesses the easily recognizable character of producing smooth, projecting colonies on an agar plate.

Rabbits have been inoculated with single-cell strains and the serum tested for agglutinating qualities. The following results have been obtained. With a single-cell smooth strain of the Schottmüller type (209 S) the serum agglutinates the homologous organism in about 1:500 dilution with a heavy flocculent precipitate. It also agglutinates other Schottmüller strains in the same manner in similar dilution. Its action on rough strains is not quite the same. Although a smooth strain serum, it agglutinates all rough strains of the Schottmüller type in higher dilution than it does the corresponding smooth strains. The precipitate, however, is finely granular instead of flocculent. It also agglutinates at least some smooth strains of the Aertrycke type in nearly as high dilution as the Schottmüller strains, *but the precipitate is always granular.*

The serum obtained with a single-cell rough strain (209 R) behaves very differently. In no instance has a "rough" serum agglutinated a smooth strain of its own group. All R strains tested, whether Schottmüller or Aertrycke type, are agglutinated by the R serum, usually in about the same dilution and always with the formation of a granular precipitate. A flocculent precipitate was never produced.

In two experiments S cultures derived from single-cell R strains by the method previously described<sup>1</sup> have been used. Both are of the Aertrycke type (223 and 239). The results are as follows:

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<sup>1</sup> Jordan, E. O., *J. Am. Med. Assn.*, 1926, xxvi, 177.

	Aertrycke Type				Schottmüller Type	
	223 S	223 R	239 S	239 R	210 S	210 R
209 S serum (Schottmüller)	+F1	+gr	+gr	+gr	+F1	+gr
209 R serum	0	+gr	+gr	+gr	0	+gr

In one instance, therefore, the alien  $R \rightarrow S$  strain behaves exactly like the homologous S strain, in the other like the generality of R strains.

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The effect of double vagotomy and tracheotomy on the susceptibility of rabbits to cocaine poisoning.

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Acute cocaine poisoning in the rabbit causes significant respiratory derangements in such a way as to lead to death of the animal. Since artificial respiration constitutes a very satisfactory method of treatment in this animal and since Richet<sup>1</sup> and Feinberg<sup>2</sup> found independently that decortication as well as decerebration raised the minimal lethal dosage of cocaine, it was thought that possibly other parts of the nervous system might contribute to the harmful effects of cocaine. This report, therefore, involves a study of the possibility of vagus involvement.

Rabbits were anesthetized with ether, double vagotomy and tracheotomy performed. After recovery from the anesthetic the animals were poisoned by subcutaneous injections of cocaine hydrochloride. It was found that this procedure raised the average minimal fatal dose from 100 to 125 mg. per kilogram in the intact animal to approximately 175 mg. per kilogram in the operated animal. Tracheotomy alone was sufficient to be equally

<sup>1</sup> Richet, C., *Arch. Int. Pharmacol.*, 1898, iv, 299.

<sup>2</sup> Feinberg, I., *Berl. Klin. wachnschr.*, 1887, xxiv, 166.