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Conversion of Rough to Smooth Forms of Certain Dysentery Bacilli by Repeated Transfers in Dextrose Broth.

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In our study of the factors influencing change in colony form it was found that repeated transfers in dextrose broth were quite effective in causing reversion of R to S forms of *Bact. dysenteriae,* Sonne. A typical experiment is shown in the accompanying table.

In this and in similar experiments with different R isolations of other strains, irregularity in the rate of reversion to the S form was always seen. In some cases S colonies appeared early in the series of dextrose broth transfers and soon entirely replaced the R forms, while in other instances only a few S forms resulted even after a number of transplants. Also, intermediate and other variant colony forms were more rarely encountered here than in the course of the S to R change.

In a number of instances cultures which had undergone the S to R change in broth or peptone solutions and then the R to S reversion in dextrose broth were subjected to comparison with the original or parent S culture of the same strain. The newly converted S forms produced the same uniform turbidity in nutrient broth and similar fermentation results in dextrose, lactose and sucrose broths, and they were agglutinated by immune S serum apparently in as high dilution as was the parent S culture. In 0.85% salt solution, however, the recently derived S forms showed some

TABLE I.

Daily Transfers 37°C.	3 Separate R Isolations *Bact. dysenteriae,* Sonne. Strain number 268.		
At start	100 R*	100 R	100 R
5th	10 R	100 R	20 R
	90 S		20 I
			60 S
10th	1—R	100 R	28 R
	99+S		72 S
15th	100 S	100 R	5 I
			95 S
20th	100 S	97 I	4 I
		3 S	96 S

* Results are expressed in percentages of the different colony types.
S = Smooth, R = Rough, and I = Intermediate between S and R.
Strain 268 was secured originally from the British Type Collection.

tendency to spontaneous agglutination, while the original S culture showed no such tendency.

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The Chloride Content of the Tissues.*

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In normal animals the chloride content of the blood is maintained at 280-320 mg. percent, even under the conditions of a negative chloride balance. Distilled water, injected intraperitoneally in rabbits rapidly acquires a chloride concentration up to 376 mg. percent and becomes isosmotic.[1] Consequently, by the transperitoneal perfusion of distilled water, it is possible to produce an experimental hypochloremia by dialysis.[2] The blood chloride falls and a large amount of chloride, as well as other electrolytes and organic crystalloids, is found in the dialysate. Rabbits thus treated develop muscular fibrillation, tremors and convulsions and die in from 2 to 5 hours. In a series of 13 rabbits so dialyzed, we found an average of 619 mgs., (from 205 to 896 mgs.), of chloride was removed from the animal as determined by analyses of the perfusate. During the corresponding period of dialysis, the average fall in blood chloride was 79 mgs. percent, (from 300 to 221 mgs.). As the blood volume in the rabbits used was empirically about 200 cc., not more than 175 mgs. of the dialyzed chloride could be accounted for as coming from the blood itself. The source of the other 440 odd mgs. of chloride was evidently other body tissues. As a result our attention has been turned to the chloride content of the tissues.

Two of us (C. B. D. and M. E. H.) have recently determined the chlorides in various tissues from the rabbit. As our primary interest at the time lay in the various lipoidal fractions, these analyses were all made upon dried tissues. The animals were killed by bleeding. The desired tissues were quickly removed, cut to shreds and dried in a current of warm air (40°C) for 10 hours.

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1 Curtis, G. M., *Biochem. Z.*, 1927, clxxxvi, 95.

2 Curtis, G. M., and Pacheco, G. A., PROC. SOC. EXP. BIOL. AND MED., 1929, xxvi, 874.