

Table 1. THE EFFECT OF HUMORAL TRANSFER OF FACTORS PRODUCED BY IRRADIATED CERCAE ON DEATHS OF MICE FIVE MONTHS FOLLOWING EXPOSURE TO *S. mansoni*

Mice receiving	No. of mice used	Exp. 1 * Percent cumulative deaths	P	No. of mice used	Exp. 2 † Percent cumulative deaths	P
'Immune' serum	20	30	= 0.014	20	20	= 0.024
No serum	27	70		28	50	
Normal serum	15	73	> 0.10	20	35	> 0.10

* 'Immune' serum versus normal serum; P , 0.026.

† 'Immune' serum versus normal serum; P > 0.10.

mice receiving either normal serum or no serum at all, and remained unchanged in the immunized mice (8.6 per cent).

The cumulative deaths among test and control animals were compared with the use of a χ^2 test (and in one case, Fisher exact test), and results obtained are shown in Table 1. It is clear from these results that mice receiving 'immune' serum prior to infection tended to live longer than control mice receiving no serum or 'non-immune' serum. The answer to the question whether death of mice was prevented or only delayed is beyond the scope of those short-lasting experiments.

It is noteworthy that the numbers of eggs recovered from the livers of the control mice receiving the normal serum prior to infection were also lower than the egg counts from the control mice receiving no serum. However, they rose more steadily with the passage of time than those from mice receiving 'immune' serum prior to infection. The decreased mortality among mice receiving normal serum prior to infection, as seen in Exp. 2, suggests that specific humoral antibodies may not be essential for the observed protection against *S. mansoni* infection.

The results obtained concerning egg recovery seemed to parallel those previously reported^{1,2}, showing once again that the effect of humoral factors produced by irradiated cercariae was to slow the liver egg accumulation after exposure to normal cercariae. However, the effect on worm return differed. The worm return in mice pre-infected with irradiated cercariae increased as the challenge infection became older, whereas in mice receiving 'immune serum' no such increase occurred. Furthermore, pre-infection with irradiated cercariae neither delayed nor prevented death caused by a challenge infection. In mice receiving 'immune serum' mortality was significantly reduced during the period of observation.

Further experiments will be necessary to assess the potential importance of humoral protective antibodies in immunizing procedures against schistosomes.

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¹ Perlowagora Szumlewicz, A., and Olivier, L. J., *Science*, **140**, 411 (1963).

² Perlowagora Szumlewicz, A., *Bull. WHO*, **30**, 401 (1964).

³ Wilcoxon, F., *Biometrics*, **1**, 80 (1945).

⁴ Fisher, R. A., *Statistical Methods for Research Workers*, fifth ed. 21.02 (1934).

Influence of Serum of Children and Adolescents on the Growth of Plants

Macht and Livingston introduced in 1922 a root-growth test for the investigation of the interaction between the physiology of the animal and vegetable kingdoms. Macht demonstrated in a large number of papers that, under standard experimental conditions, sera from healthy persons inhibit the growth of *Lupinus albus* roots. The

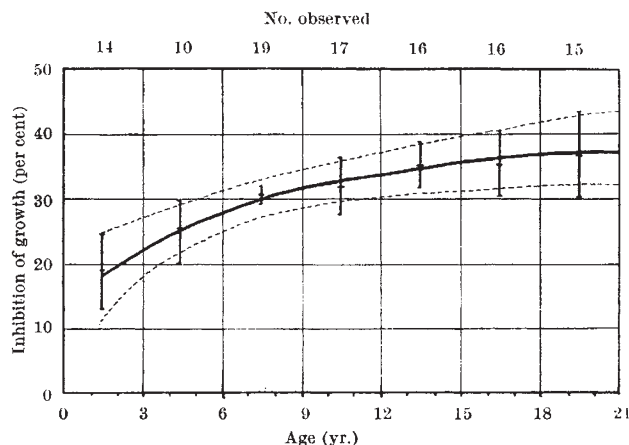


Fig. 1. Inhibition of growth of roots of *Lupinus albus* by serum from children and adolescents. Vertical lines, 95 per cent confidence limits of observed means; solid line, theoretical curve of mean values; broken lines, 95 per cent confidence limits of theoretical means

sera from patients suffering from various diseases, especially cancer, were also investigated by Rønnike¹. So far as we know, no experiments of this type have previously been made in children. From this point of view, we investigated 113 sera from children and healthy adolescents as well as 273 sera from patients affected by various diseases. In 113 sera from healthy individuals aged 9 months to 23 years we found that, with sera from individuals of increasing age and height, the growth of roots of *Lupinus albus* was increasingly inhibited. We found also that there is no substantial difference between the average inhibition caused by sera from boys or girls. Fig. 1 summarizes our experiments.

We have analysed the inhibitory effect of sera of healthy children as well as children treated for prolonged periods with corticosteroids, and children suffering from malignant growths. These results will be published in a later communication.

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¹ Rønnike, F., *Dan. Med. Bull.*, **6**, 198 (1950).

Hardening Treatment of Seeds as a means of increasing Yields under Conditions of Inadequate Moisture

GENKEL *et al.*, as well as a number of other investigators, have claimed that 'hardening' treatment of seeds increases the drought, heat and frost resistance of plants developing from the treated seeds^{1,2}. This 'hardening' treatment or 'P. A. Genkel's method' is nothing else but the repeated soaking and drying of seeds before sowing, a method already reported by Will³ in 1883 as being effective in increasing drought and frost resistance. It is claimed that plants made drought resistant in this way yield higher yields under drought conditions. As an example, we cite Mart'yanova⁴, who reports for barley grown in 1957 a yield of 28 centner/hectare of treated and of 18 centner/hectare for untreated plants.

Zubenko⁵, working with corn, concludes that this method "could be recommended for wide use in crop production . . . when growing it in conditions of inadequate moisture without sprinkling and also with irrigation". In a recent extensive survey of the Russian work, May, Milthorpe and Milthorpe⁶ have stressed the need of exploring the practical value of this technique because the 'hardening treatment', if successful, would be one of the