the first infection, three to four weekly intraperitoneal inoculations of *P. berghei*, beginning with 20 million and ending with 60 million parasites. The rats were mated, and during the second half of their pregnancy received one or two intravenous inoculations of 25 million parasites.

All these rats produced normal litters which were nursed by their own mothers. Each litter was divided into three groups, and the combined litters in each group were challenged by an intraperitoneal inoculation of 1–3 million parasites at 2 weeks, 3 weeks and 4–5 weeks of age. The baby rats were followed up by blood examinations every two days (Table 1).

Table 1. Results of Challenging Infections with *P. berghei* of Litters produced by Immune and Normal Mother Rats

	Litter from immune mothers Age at challenge (days)			Litter from normal mothers Age at challenge (days)		
	13–15	20–22	28–32	13–15	21–23	28–34
Numbers challenged	22	20	18	18	19	20
Dose of parasites	10^7	2×10^7	3×10^7	10^7	2×10^7	3×10^7
Numbers died	22	17	9	18	19	19
Mortality (per cent)	100	85	50	100	100	94·5
Average survival time of fatal infections (days)	12·5	15	18·6	10·8	14·6	14·8
Mean peak parasitæmia (per cent parasitized red blood cells)	94·0	80·5	67·4	94·4	98·5	91·0

It appears that young rats born from mothers immune to *P. berghei* exhibit some tolerance to a challenging infection with this parasite, whereas the infection in control baby rats delivered from normal mothers is usually fatal. This transmitted tolerance becomes obvious only towards the end of the nursing period.

To find whether the young rats obtain their inherited relative immunity through milk, four groups of litters produced by two immune and two normal mother rats were interchanged at the age of 3–4 days after birth and later challenged at the age of 15 and 30 days respectively (Table 2).

Table 2. Results of Challenging Infections with *P. berghei* in Two Groups of Interchanged Litters

	Litter from immune mother nursed by a normal mother Age at challenge (days)		Litter from a normal mother nursed by an immune mother Age at challenge (days)	
	15–16	30–32	14–16	31–32
Numbers challenged	6	7	7	8
Numbers died	6	6	6	5
Mortality (per cent)	100	85	85	62·5
Average survival time of fatal infections (days)	14·5	16	12·2	13·5
Mean peak of parasitæmia	91·0	94·6	93·7	76·0

The results of this preliminary investigation suggest that any inherited relative immunity to challenging infections with *P. berghei* in young rats is transmitted mainly by milk of immune mothers and evident only during the late part of the nursing period.

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Spawning Sites of Trout

In a previous communication[1], it was stated that field observations suggest there is a regular downward flow of water through the gravel beneath the river-bed at the sites favoured by salmon and trout when making the spawning redd. The course of these sub-surface currents, as experimentally determined in the laboratory in a 6 ft. × 1 ft. artificial stream pool, was described. It was found that the maximum flow occurs in the vicinity of the mound of gravel usually present near the lower end of a spawning pool, that is, where redds are commonly found. The present spawning season offered an opportunity of testing the behaviour of a pair of gravid trout introduced into the experimental pool. Normal 'courtship' behaviour was observed and spawning took place. Ova (425) were deposited in three pockets, all excavated within the predicted area, the site of the initial cutting being just below the apex of the gravel mound, where the strongest sub-surface flow had been found to occur; 100 per cent fertilization resulted. In a second experiment with another gravid pair, three pockets of ova have been again deposited in exactly the same site.

An interesting demonstration of the penetration of stream water into the sub-surface gravel was obtained by burying ripe ova, obtained by stripping a female trout, in the mound of gravel in the experimental tank, some 4 ft. distant from the inflow. A dilute suspension of spermatozoa from a ripe male was then poured into the inflow rush. Investigation showed 30 per cent of the buried ova to have been fertilized by spermatozoa carried by downward currents through the gravel. A second similar experiment with a more concentrated suspension of spermatozoa yielded just over 60 per cent fertilization. These results suggest that in a stream with a mixed salmonid population cross-fertilization is at least possible on physical grounds.

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[1] Stuart, T. A., *Nature*, 172, 407 (1953).

A New Species of Freshwater Triclad belonging to the Genus *Polycelis*

Our studies of the genus *Polycelis* from western Europe have revealed that the species complex *nigra-tenuis* in reality includes not two but three different species, which are easily recognized if the anatomy of the copulatory organs or the chromosomes are studied. However, it is scarcely possible to identify these species from their external appearance.

Below, the main species differences are set down, though the anatomy (E. H.-M.) and the chromosomal conditions (Y. M.) will be described soon, in full, elsewhere.

Polycelis nigra (O. F. Müller, 1773) has a short, rounded penis with two to three rows of chitinous spines around its opening. The glandular bursalis is large. There are no adenodactyls.

Polycelis tenuis Ijima, 1784 has a large, long and pointed penis, the surface of which is covered with thick chitinous spines. The glandular bursalis is a small one. This species always has two well-developed adenodactyls.