In the forty-four larvæ examined, all three instars were present, and among the largest were some in which the fat body was well developed, giving a creamy appearance through the integument, a characteristic of fully fed larvæ in other species. No cocoons or pupæ were observed, however.

From what is known of the life-history of the Arctic hare, it is clear that no permanent nest or resting-place is used. Out of the breeding season they rest in forms, often in the shelter of boulders, but these are not permanent; they sometimes form burrows in the snow; but these also are impermanent and would contain no detritus. In the breeding season the young are said to be active after only three days in a form, which is too short a time for even one flea life-cycle. It may be noticed, however, that the larvæ were only found in May, June and July, which is the normal breeding season of the hares[4,5,6].

The only record in the literature of larvæ living on the host that is known to us is a single case in the chigoe *Tunga penetrans* (L.), where the larvæ were found in the scrapings of human skin[7]. In this species the female burrows in the skin of the host, and lays its eggs without leaving the burrow. The larvæ are normally found in the 'nests' of the host, which is man. In *H. glacialis* the adult does not burrow, and it appears that the larval ectoparasitic habit is a normal one, and not an occasional occurrence.

R. B. Freeman

Department of Zoology,
University College,
London, W.C.1.

Holger Madsen

Jagtraadets Vildtbiologiske Undersøgelse,
Nørregade 10,
Copenhagen.

Feb. 9.

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Experimental Macrocytic Anæmia in the Rat Treated with Purified Liver Extract, Pteroyl Glutamic Acid and Vitamin B_{12}

We have described elsewhere a technique for the production of experimental macrocytic anæmia in the rat by the formation of a *cul-de-sac* in the small intestine, and preliminary observations suggested that a hæmatological remission could be induced in some of the anæmic animals by treatment with purified liver extracts[1,2]. An experiment was planned to test the effects of continued treatment with large doses of purified liver extract ('Anahæmin'), pteroyl glutamic acid and vitamin B_{12} on this experimental anæmia, and the results so far are sufficiently interesting to warrant this brief report.

The blood counts of the rats in our post-operative colony were checked at weekly intervals, and anæmic animals were assigned in sequence to the four groups shown in the accompanying table. All the animals were maintained on a standard diet under similar conditions. Group I received no treatment, and served as controls. Group II were given 0·5 c.c. of 'Anahæmin' by intramuscular injection three times weekly. Group III were given 7·5 mgm. of pteroyl glutamic acid by intramuscular injection three times weekly, and Group IV received 20 μgm. of vitamin B_{12} by intramuscular injection three times weekly. A total of 26 rats was used in the four groups.

Controls	'Anahæmin'	Pteroyl glutamic acid	Vitamin B_{12}
11	20	*139	1
15	16	20	11
1	*74	*122	*43
*106	4	*72	1
23	9	*79	*72
34	2	*51	2
6	*30	—	—
—	—	—	—
Mean survival 28	22	80·5	21·2

The figures show the number of days that each animal survived after treatment had begun. The italic figures refer to rats which are still alive at the time of writing, and asterisks indicate animals which gave a hæmatological response. It is evident that pteroyl glutamic acid increased the survival time whereas neither 'Anahæmin' nor vitamin B_{12} seemed to prolong the lives of anæmic rats. In fact, these last two therapeutic substances gave a shorter mean survival than the controls, though the reduction is not statistically significant. The number of animals is small, and some of them died from complications, such as rupture of the distended segment of gut, or from causes other than anæmia.

Animals were considered to be anæmic when their hæmoglobin-levels had fallen below 10 gm. per 100 ml., and stained blood films showed the characteristic blood picture. A hæmatological remission was considered to have occurred if an animal survived four weeks or more and its hæmoglobin-level rose to or above 11 gm. per 100 ml. One spontaneous remission was observed in the control group, while there were two remissions in each of the groups treated with 'Anahæmin' and vitamin B_{12} and five in the group treated with pteroyl glutamic acid. It is apparent that a high proportion of anæmic animals responded to pteroyl glutamic acid. The effects of 'Anahæmin' and vitamin B_{12} were not so clear cut. It is our impression that the remissions observed after the exhibition of these two substances were not fortuitous; but in view of the undoubted occurrence of spontaneous remissions in untreated rats, it will be necessary to extend the present series to clear up this point.

In view of the capricious responses to liver extract and vitamin B_{12} and the apparent inability of these substances to prolong the lives of anæmic animals, our earlier suggestion that this preparation might be useful in the assay of the anti-anæmic factor has not been substantiated. Nevertheless, the preparation will be valuable in studying the role of pteroyl glutamic acid in the macrocytic anæmias and its relationship to the liver factors.

We are indebted to Dr. E. Lester Smith and Messrs. Glaxo Laboratories, Ltd., for supplies of vitamin B_{12}.

D. G. Cameron
S. T. E. Callender
G. M. Watson
L. J. Witts

Nuffield Department of Clinical Medicine,
Radcliffe Infirmary,
Oxford. Feb. 9.

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