cytes clearly showed an envelope. Fixation and drying produced specimen changes, and in the specimens examined the processes of electron microscopy provoked less radical changes than did the fixation.

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17285. Effect of Thymine Desoxyriboside (Thymidine) on Human Pernicious Anemia.

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Shive *et al.*[1] isolated from liver a crystalline substance that inhibited the antagonistic action of methyl-folic acid on the growth of *Leuconostoc mesenteroides* 8293. This substance was identified as thymidine, the desoxyriboside of thymine. Wright *et al.*[2] reported that thymidine could replace vitamin B-12 as a growth factor for certain lactic acid bacteria. Hypoxanthine, adenine or cytosine desoxyribosides[3] and guanine desoxyriboside[4] have also been shown to be able to replace vitamin B-12 as a growth factor for various bacteria.

From this evidence it seemed possible that vitamin B-12 may participate in the synthesis of desoxyribosides, essential to the formation of desoxyribose nucleic acids. Since thymine is effective in combating the hematologic lesions of pernicious anemia, nutritional macrocytic anemia and sprue,[5] the effect of thymidine on patients with pernicious anemia was investigated.

Methods. Three patients with Addisonian pernicious anemia in relapse were treated. All of them had a macrocytic, high color index anemia, with gastric achlorhydria after histamine and megaloblastic hyperplasia of the bone marrow. Reticulocyte counts were done daily, and erythrocyte counts twice a week during the period of observation.

Results. In the first patient, a single injection of 5.3 mg of thymidine was followed by an increase of reticulocytes from 2.0 to 5.0% 4 days later, but by no significant rise in erythrocytes. One week after administration of the thymidine, daily intramuscular injections of 0.001 mg of vitamin B-12 were begun. There was a reticulocyte rise to 10.3% and the red blood cells rose from 2,430,000 to 4,250,000 in the next 13 days.

In the second patient a single injection of 150 mg of thymidine was followed by a rise in reticulocytes from 0.4% to 5.3% on the 4th day, but the red count failed to rise during the week following the injection. Daily intramuscular injections of 0.001 mg of vitamin B-12 were then started. Reticulocytes were 37% on the 7th day and the blood count had risen from 1,600,000 to 4,200,000 on the 21st day of this therapy.

The third patient received a sub-optimal intramuscular dose of 0.00025 mg of vitamin B-12 daily. Reticulocytes increased to 15.5% on the 8th day, and were 1.8% on the 17th day of therapy. At this time, in addition to the vitamin B-12, 5 mg of thymidine was given intramuscularly daily for 9 days. There was a secondary reticulocyte rise from 0.8% on the 18th day to 2.8% on the 21st, 22nd,

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and 24th days. Injections of 0.00025 mg of vitamin B-12 were continued from the 27th to the 40th day. During the first period of vitamin B-12 alone the red blood cell count rose from 1,850,000 to 2,220,000. During the second period with thymidine added the count increased further to 2,800,000. At the end of the third period of sub-optimal vitamin B-12 alone it had decreased to 2,600,000.

Discussion. The replacement ratio of thymidine for vitamin B-12 is about 300:1 for the growth of *L. lactis*.[6] We have seen a maximal reticulocyte response in pernicious anemia to as little as 4 μg of B-12.[7] A dose of 5 mg of thymidine should therefore be more than adequate if the ratios observed in the bacterial growth system obtain for man. (That this is so for thymine with reference to folic acid was shown by Spies and his associates.[5]) From the results we obtained, it appears that thymidine alone is incapable of sustaining blood regeneration, although it does appear to cause a slight increase in reticulocytes. Similar results were reported by Geerts and Lens using doses of 10 mg of thymidine a day for 3 days.[8] From our observations it is apparent that the response to 150 mg was no greater.

It has been suggested that crude liver extracts may contain substances that give an enhanced hematopoietic response compared to B-12, and thymidine may be one of these accessory substances.[9] From our study it appears that thymidine is not completely inert hematopoietically, but if it has an enhancing effect on B-12 activity, this effect is very slight in the dosage used in this study. In view of the ability of other desoxyribosides to substitute for B-12 in bacterial growth, the effect of mixtures of desoxyribosides on pernicious anemia should be investigated.

Summary. 1. In 3 patients with pernicious anemia, thymidine in doses of 5 to 150 mg was found to cause slight reticulocytosis, but no effect on the red blood count.

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17286. Effect of Adrenalectomy on Eosinophil Response of Rats Infected with *Trichinella spiralis*.

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Recently there have appeared reports[1-4] that adrenal hormones depress the number of circulating eosinophils. Injection of adrenal cortical hormone will cause a lowering of the number of circulating eosinophils, or injection of adrenotrophic hormone from the pituitary will accomplish the same result if the adrenal gland is intact. In fact, this lowering of the eosinophils taken together with other changes in the body chemistry is proposed as a test for adrenal cortical insufficiency. Presumably the presence of the adrenal cortex has an inhibitory influence on the eosinophil producing bone marrow.

The eosinophil response to infection with *Trichinella spiralis* usually is striking in

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