rats. Moreover, treated animals which recover are equally prone to develop long term radiation effects such as the development of osteogenic sarcoma(10).

10. Koletsky, S., Bonte, F. J., and Friedell, H. L., *Cancer Res.*, 1950, v10, 129.

Summary. Streptomycin and penicillin in combination proved effective in reducing the mortality of rats given lethal doses of radioactive phosphorus. Morbidity was also reduced and survival time prolonged.

Received July 31, 1950. P.S.E.B.M., 1950, v75.

Treatment of Pernicious Anemia with Crystalline Vitamin B_{12}.* (18200)

LEO M. MEYER, ARTHUR SAWITSKY, HAROLD FINK, NORTON D. RITZ AND MENDEL KRIM.

From the Department of Therapeutics, New York University College of Medicine, N. Y.

Since the initial report by West(1) it has been suggested that one microgram of vit. B_{12} is approximately the equivalent of one U.S.P. unit of liver extract when administered parenterally to patients with pernicious anemia in relapse(2,3). Jones, Darby and Totter found that the daily intramuscular administration of 1 μg of vit. B_{12} for 22 days was followed by an excellent reticulocyte response and a satisfactory rise in hemoglobin and erythrocytes during the period of treatment (4). More recently, treatment of 30 patients with pernicious anemia in remission with vit. B_{12} concentrate in doses of one microgram daily by intramuscular injection every 3 to 4 weeks, failed to maintain optimal hematologic levels in 20 of the cases(5).

In the present study 8 persons with typical Addisonian pernicious anemia were divided into 2 groups. Four patients were treated with 1 μg of crystalline vit. B_{12} intramuscularly, daily, for 10 days, and thereafter with 14 μg every 14 days. The second group received 2 μg of vit. B_{12} intramuscularly, daily, for 10 days followed by 14 μg every week. All patients showed hyperchromic macrocytic anemia, histamine fast achlorhydria and megaloblastic bone marrow. X-ray examinations of the gastrointestinal tract, urinalyses, and blood chemistry determinations were all normal.

Results. A summary of the data is presented in Table I. The patients in the group receiving 1 μg of crystalline vit. B_{12} intramuscularly, daily, were observed for periods ranging from 53 to 108 days. The reticulocyte response in all instances was suboptimal. In only one case did the hemoglobin and erythrocytes reach normal levels, and this occurred after 108 days. The remaining 3 persons maintained stationary submaximal levels for 23 to 59 days. Patients G. and P. reached normal levels when treated with doses of liver extract which were greater than the equivalent of one U.S.P. unit a day (30 units a week for 2 months). The fourth patient, V. H., failed to report for liver extract therapy. All of the patients showed satisfactory clinical improvement as evidenced by increase in appetite, sense of well-being and gain in weight. Only one patient, V. H., showed signs of neurologic disease at the onset of treatment, and no change was observed after 93 days. The 4 patients receiving 2 μg of crystalline vit. B_{12}, intramuscularly, daily, were observed for periods varying from 48 to 250 days. The reticulo-

* Expenses for these studies were defrayed by Lederle Laboratories Division, American Cyanamid Company, Pearl River, N. Y.

1. West, R., *Science*, 1948, v107, 398.

2. Bethel, F. H., Meyers, M. C., and Neligh, R., *J. Lab. and Clin. Med.*, 1948, v33, 1477.

3. Hall, B. E., and Campbell, D. C., *Proc. Staff Meet., Mayo Clinic*, 1948, v23, 584.

4. Jones, E., Darby, W. J., and Totter, J. R., *Blood.*, 1949, v4, 827.

5. Meacham, G. C., Vignos, P. J., Heinle, R. W., Weisberger, A. S., and Epstein, M., *J. Lab. and Clin. Med.*, 1950, v35, 713.

TABLE I. Hematologic Data on Patients with Pernicious Anemia in Relapse Treated with 1 and 2 μg Vitamin B_{12} Daily.

B_{12} dose, μg/day	Patient	Initial Hb, g	Final Hb, g	Initial R.B.C. $\times 10^6$	Final R.B.C. $\times 10^6$	Retic. % peak/day	Days of observation	Remarks	Days
1	G	8	14	1.89	4.37	8.1/7	53	Blood count stationary	25
	P	5	10	1.46	3.48	10.4/10	63	" " "	23
	M	6	15	1.40	4.67	21.0/8	108		
	V.H.	7.5	12	2.43	3.66	No*	93	" " "	59
2	S	8	15	2.30	5.10	16.4/6	132	Normal blood count in	48
	Mc.	6	14	1.85	4.75	20.6/7	83	" " " "	69
	Mi.	5.5	13.8	1.25	4.85	40.9/8	250	" " " "	47
	F	5.5	12	1.50	4.60	33.0/9	48	" " " "	48

* No retic. response.

cyte response was optimal in 3 instances and submaximal in the fourth case. Normal hematologic levels were attained in 47 to 69 days. The clinical response as regards appetite, gain in weight, strength and improvement in well being, were the same as those observed with adequate doses of liver extract or folic acid. All four cases showed moderate to advanced neurologic changes prior to treatment. No improvement, other than disappearance of numbness and tingling in one patient was observed.

The authors have under treatment 2 groups of pernicious anemia patients in remission who are receiving 14 μg of crystalline vit. B_{12} intramuscularly every 7 or 14 days. It is too early to compare these data with those presented by Meacham *et al.*(5).

Summary. (1) Four patients with pernicious anemia in relapse were treated with 1 μg of crystalline vit. B_{12}, intramuscularly, daily. Three cases showed submaximal reticulocyte responses and failed to reach normal blood levels in 53 to 93 days. Clinical improvement was observed in all instances. (2) Four other patients with pernicious anemia in relapse, treated with 2 μg of crystalline vit. B_{12}, intramuscularly, daily, showed satisfactory clinical improvement, optimal reticulocyte responses, and normal blood levels in 48 to 69 days. Symptoms of neurologic disease disappeared in one person but persistent signs were observed in all 4 cases.

Received July 31, 1950. P.S.E.B.M., 1950, v75.

Inhibition of Phagocytosis by Aureomycin. (18201)

J. MUNOZ AND R. GEISTER. (Introduced by Milan V. Novak)

From the Department of Bacteriology, University of Illinois, Chicago.

Aureomycin is a widely used antibiotic in the therapy and control of many bacterial, viral and rickettsial diseases(1). It is apparently tolerated in large doses in human patients as well as in experimental animals, and aside from minor gastro-intestinal disturbances and rare allergic reactions, few untoward signs of toxic manifestations have been observed(2,3). The doses administered clinically range from 50 mg/kg/day to 500 mg/kg/day orally(4,5), resulting in blood levels of .15 μg to 20 μg per ml. Lepine and co-workers(6) reported that aureomycin as

1. Spink, W. W., and Yow, E. M., *J.A.M.A.*, 1949, v141, 964.

2. Rosanova, A. R., and Warsjewski, E., *Med. Times N. Y.*, 1949, v77, 524.

3. Harvey, J. C., Mirick, G. S., and Schaub, I. G., *J. Clin. Invest.*, 1949, v28, 987.

4. Brainerd, H., Lennette, E. H., Meiklejohn, G., Bruyn, H. B., Jr., and Clark, W. H., *J. Clin. Invest.*, 1949, v28, 992.