TABLE II.
Effect of Intraperitoneal Injection of Manganese in Preventing Perosis.

Exp.	Chicks per lot	Injection treatment	Mg Mn. injected in 6 wks	Avg wt in g at 6 wks	% of perosis	Severity index
		Calcium 3%, phosphorus 1.5%.				
1	25	None	0	270	42	20.5
	10	Isotonic $MnCl_2$-NaCl soln	10	444	0	0
	10	" $MnCl_2$-NaCl "	20	357	0	0
	10	" $MnCl_2$-NaCl "	60	277	0	0
		Calcium 2.5%, phosphorus 1.25%				
2	20	Isotonic NaCl soln	0	320	40	14
	20	" $MnCl_2$-NaCl soln	14	360	0	0

Shelling and Jackson,[9] who obtained rickets in rats by including large amounts of either manganous chloride or manganous carbonate in diets in which the calcium-phosphorus ratio was 1.1 to 1. Still further support is provided by the results of Wilgus and Patton,[10] who found that the amount of dializable manganese in the intestinal tract of chicks decreases with an increase in the calcium and phosphorus content of the diet.

Summary. The relative effectiveness of ingested and injected manganese in preventing the development of perosis in chicks fed a high calcium-phosphorus diet was studied. The results obtained showed that excess calcium and phosphorus in the diet greatly reduces the availability of manganese in the intestinal tract.

10504 P

Experimental Production of Leprosy in the Rabbit with Chrome Acid-Fast Culture.

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It has been noted[1] that the rabbit is susceptible to inoculations with culture of Duval's chromogenic acid-fast bacillus from leprosy. Observations on its behavior to infection by an old and recent chrome acid-fast culture from the human leprous lesion are, therefore, described here. *B. smegmatis* and *B. phlei* were used as controls.

9 Blumberg, H., Shelling, D. H., and Jackson, D. A., *J. Nutr.*, 1938, **16**, 317.

10 Patton, A. R., and Wilgus, H. S., Jr., *J. Nutr.*, 1939, in press.

1 Kriz, J. R., *Am. J. Trop. Med.*, 1938, **18**, 213.

Twenty-four full grown healthy rabbits were divided into 4 groups of 6 each. The various groups received 2 cc of a heavy suspension of the respective cultures. Subcutaneous and intraperitoneal injections were made at weekly intervals for a period of 3 weeks. Four months following the last injection, 2 animals from each group were sacrificed and observed for gross and microscopic lesions. At time of autopsy blood cultures were made and material from the animal lesions were inoculated on various special media in an attempt to recover the microörganism used as the inoculant. The records of the observations made on the first series, *i. e.*, 4 months after the last injection, are summarized in Table I. Histological sections of all organs were stained with hematoxylin-eosin and also prepared by the Ziehl-Neelsen method.

The results of the first series of experiments show that there are significant differences among the 4 groups. It is interesting to note that the animals in Group 2, inoculated with the recent culture, produced the most marked changes, indicating a greater virulence for the more recent isolation. The gross lesions seen in animals of Group 2 resemble closely those found in human leprosy while the microscopic changes were identical to the human lesion, namely, aggregations of lymphoid and epithelioid cells with many mononuclear "foamy" cells containing myriads of acid-fast bacilli, so-called "globi."

The chromogenic acid-fast bacillus of leprosy employed in the experiments was cultured from the gross lesions only after incubation

TABLE I.

	Gross Lesions	Microscopic	Culture
Group 1. *B. leprœ* (old culture)			
Rabbit A	Few pin-point nodules in liver.	Epithelioid, lymphoid, occasional giant cell.	+
" B	None	None	—
Group 2. *B. leprœ* (recent culture)			
Rabbit A	Many large discrete nodules in liver, spleen, omentum, mesentery	Epithelioid, lymphoid, giant cells and "globi" with acid-fast bacilli.	+
" B	"	"	+
Group 3. *B. smegmatis*			
Rabbit A	None	None	—
" B	"	"	—
Group 4. *B. phlei*			
Rabbit A	None	None	—
" B	"	"	—

at 37.5°C for 26 days. Morphologically and tinctorially the recovered culture was identical to the organism used as the inoculant. Likewise a chromogenic acid-fast bacillus was cultured from the liver of the rabbit from Group 1, requiring 18 days before visible growth was noted. Cultures were not recovered from the control animals of Groups 3 and 4. Although Duval and Harris[2] pointed out that saprophytic acid-fast microörganisms produce lesions in the experimental animal following repeated massive doses 4 to 6 weeks after the last injection, no lesions were noted in any of our control animals, 4 months after the last injection.

Summary. The recent chrome acid-fast culture produces lesions in the rabbit that grossly and microscopically resemble those seen in human leprosy. Here, the lesion is definitely progressive over a period of 4 or more months. During this period it is noteworthy that the exciting microörganism steadily increases in number. The "foamy" cells are crowded with dense colony-like masses of the specific bacillus. The chromogenic acid-fast bacillus was recovered in culture from the lesions of the animals 4 months following the last injection. The isolation of the bacillus used in the experiment was more difficult from the lesions that were 4 months old than from the earlier lesions. Visible growth occurred only after 4 weeks' incubation. In the control animals no gross or microscopic lesions were noted 4 months after the last inoculation. The cultures inoculated with material from these animals remained sterile after 4 weeks' incubation.

10505 P

Control of Vitamin K Therapy. Compensatory Mechanisms at Low Prothrombin Levels.*

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The use of vitamin K to combat the lowered plasma prothrombin level in jaundiced bleeders[1, 2] has created a demand for a simple

2 Duval, C. W., and Harris, W. H., *J. Med. Res.*, 1913, **23**, 165.

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1 Warner, E. D., Brinkhous, K. M., and Smith, H. P., PROC. SOC. EXP. BIOL. AND MED., 1938, **37**, 628; *Am. J. Med. Sci.*, 1938, **196**, 50.

2 Butt, H. R., Snell, A. M., and Osterberg, A. E., *Proc. Staff Meetings of the Mayo Clinic*, 1938, **13**, 65; *ibid.*, 1938, **13**, 753.