This result emphasizes the necessity in attempting prophylactic control of Mexican virus infection, of testing vaccines prepared from Vallée A strains other than selected Mexican strains under controlled experimental conditions before using them in the field.

opment of primary and secondary lesions; strain 119, 16 cattle; strain MP, 8 cattle; strain M.1, 8 cattle.

This result shows that a large dose of a strain 119 vaccine is insufficient to mask the antigenic dissimilarity between strain 119 and the Mexican strains MP and M.1 and that the tongue inoculation test as well as the contact exposure test can be used to demonstrate these differences in antigenic behavior.

16623

Effect of BAL on Cobalt-induced Polycythemia in Rats.

LEON O. JACOBSON, EDNA K. MARKS, AND EVELYN GASTON.

From the Argonne National Laboratory and the Department of Medicine, University of Chicago, Chicago, Ill.

Introduction. In preparation for a study of the effect of BAL (British Anti-Lewisite) on the biological effects and the excretion of radioarsenic (As^{76}), an experiment was designed to determine the influence of this chemical agent on the development of cobalt-induced polycythemia in rats. The mechanism of cobalt-induced polycythemia is not understood.

Barron *et al.*[1] demonstrated a decreased respiration (Warburg) of hemopoietic tissue from cobalt-stimulated animals. This was not corroborated by Warren *et al.*[2] Recently Burk *et al.*[3-5] have shown that the toxic action of cobalt is related to its effect on –SH groups. It seemed worthwhile, therefore, to determine whether or not BAL, which is effective in the protection of –SH groups from arsenical poisoning, would prevent cobalt-induced polycythemia in rats.

Material and Methods. Young Sprague-Dawley rats weighing approximately 300 g each were divided into 5 groups and prepared as follows: Group I (5 rats) served as a control; Group II (5 rats) received 0.2 mM/kg of BAL in peanut oil intramuscularly 3 times weekly; Group III (15 rats) received cobaltous chloride subcutaneously 5 times weekly (0.357 mg calculated as Co); Group IV (5 rats) received 0.2 mM/kg of BAL 3 times weekly; and Group V (5 rats) received cobalt as above but the BAL was begun 6 weeks after the cobalt was initiated.

Two control hemoglobin and hematocrit (Kato) determinations were made on all rats prior to starting the BAL or cobalt injections and at biweekly or monthly intervals thereafter.

Results. As is indicated in Fig. 1 and 2 the animals which were given BAL and cobalt from the beginning of the experiment, the animals which were given cobalt from the beginning and BAL 6 weeks later, and the animals which were given only cobalt developed a comparable polycythemia (increase in hemoglobin and hematocrit values) in approximately 8 weeks. The hemoglobin and hematocrit values of control animals and animals that received BAL only remained essentially constant.

Discussion. The dose of BAL used in this

[1] Barron, A. G., and Barron, E. S. G., PROC. SOC. EXP. BIOL. AND MED., 1937, **35**, 407.

[2] Warren, C. O., Schubmehl, G. S., and Wood, I. R., *Am. J. Physiol.*, 1944, **142**, 173.

[3] Burk, D., Schade, A. L., Hesselbach, M. L., and Fischer, C., *Fed. Proc.*, 1946, **5**, 126.

[4] Burk, D., Hearon, J., Caroline, L., and Schade, A. L., *J. Biol. Chem.*, 1946, **165**, 723.

[5] Burk, D., Hesselbach, M. L., Fischer, C., Hearon, J., and Schade, A., *Cancer Research*, 1946, **6**, 497.

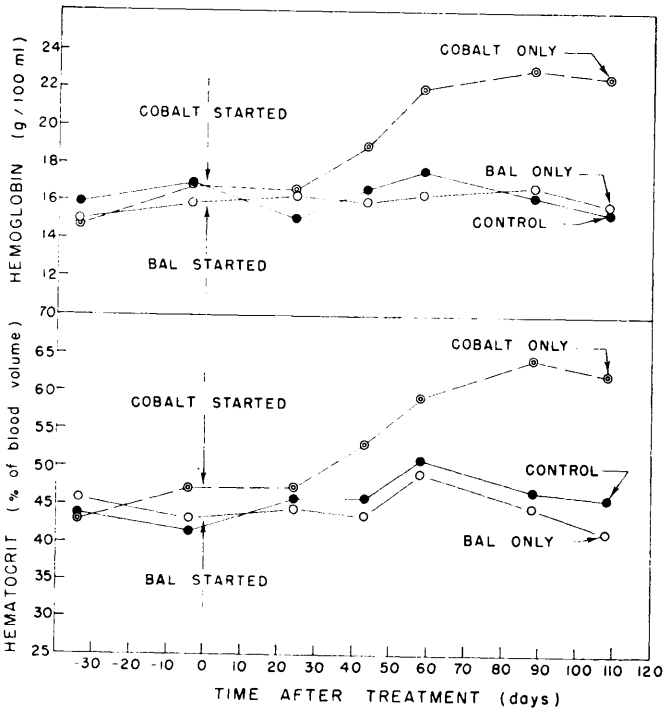

FIG. 1. Effect of 0.2 mM/kg BAL injected intramuscularly 3 times weekly and the effect of cobaltous chloride (0.357 mg calculated as Co) injected subcutaneously 5 times weekly on the hematocrit and hemoglobin values of rats.

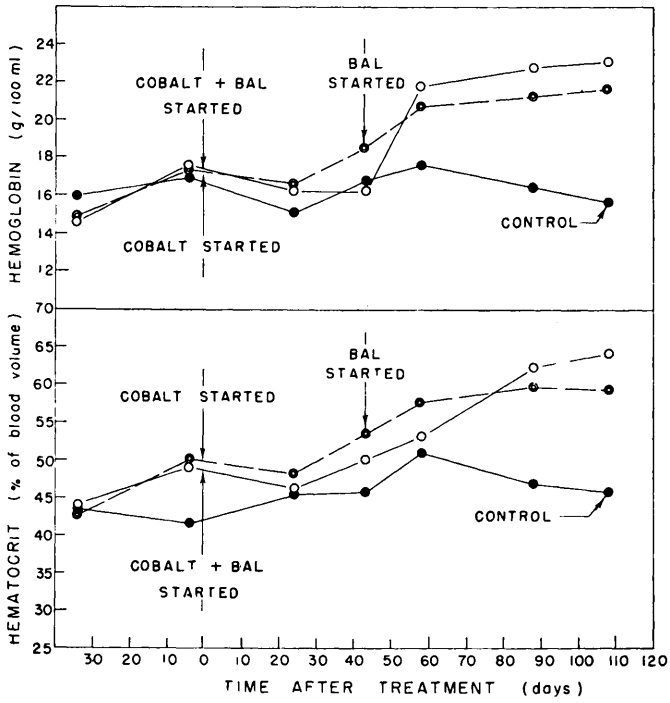

FIG. 2. Effect of 0.2 mM/kg BAL injected 3 times weekly + 0.357 mg cobaltous chloride injected 5 times weekly and the effect of cobaltous chloride + BAL, beginning 6 weeks after cobalt treatment had been initiated, on the hemoglobin and hematocrit values of rats.

experiment has been shown by Olcott *et al.*[6] to be essentially nontoxic for rats when given over a period of 18 days. This dose is 10 times the minimal effective dose for the treatment of acute arsenical poisoning in cats. Since the mechanism of cobalt-induced polycythemia is not known, little can be said concerning the apparent ineffectiveness of BAL to prevent it in rats under the conditions of this experiment. The toxicity of BAL seems to be relatively minimal since administration over a period of 3½ months produced little effect other than slightly retarding weight gain. This experiment indicates that a comparative study of the effect of radioarsenic (As^{76}) on cobalt-induced polycythemia in rats with or without BAL injection is feasible.

Conclusions. BAL in a dose of 0.2 mM/kg given 3 times weekly fails to prevent, cure, or materially alter cobalt-induced polycythemia in rats. The general toxicity of BAL appears minimal when given in this dosage over a 3½-month period.

6 Olcott, C. T., and Riker, W. F., *Science*, 1947, **105**, 67.

16624 P

A Fibrillar Structure in Rat Fibroblasts as Seen by Electron Microscopy.

FREDERIK B. BANG AND GEORGE O. GEY.

*From the Departments of Medicine and Surgery, Johns Hopkins University School of Medicine, Baltimore, Md.**

During the course of comparative tissue culture studies of a strain of normal rat fibroblasts and its malignant cell derivative,[1] we obtained preparations of both of these cell types which under the electron microscope† showed an unmistakable fibrillar structure in the thinly spread cytoplasm. The fibrils, of an estimated thickness of 10 to 100 mμ, may converge and diverge in fan-like formations of great regularity (Fig. 1) but are more often seen gathered together in long bands of varying widths (Fig. 2). The composite bands are seen clearly in phase microscope movies of the cells,[3] but it is only by the increased resolution available with the electron microscope that the nature of the bands becomes clear. They are apparently composed of long thin converging fibrils which in general radiate from the dense central area. That the fibrils are not produced by a wrinkling of the formvar membrane on which the cell is stretched is indicated by their uniformity, by their sharp change in direction in certain areas of the periphery, and by their fine converging and diverging structure. Besides this, no wrinkles were seen in the membrane outside of the cellular area where clear visualization is possible.

Of interest are the relations of these bands to the general structure. The mitochondria, often long and thin, seem frequently to be associated with individual fat droplets. Some of the elongated mitochondria are found in areas which show many microsomes, with the

* Supported in part by a grant-in-aid from the U. S. Public Health Service.

† Our technic of study of tissue cultured cells is essentially that of Porter[2] with the exception that fixation and staining has been limited to 10 minutes exposure to osmic acid vapors.

We are indebted to Warren A. Hovis for constant careful technical assistance in the preparation of the slides and photographs.

1 Gey, G. O., *Cancer Research*, 1941, **1**, 737 (abs.); Firor, W. M., and Gey, G. O., *Ann. Surg.*, 1945, **121**, 700.

2 Porter, K. R., Claude, A., and Fullam, E. F., *J. Exp. Med.*, 1945, **81**, 233.

3 Gey, G. O., Gey, M. K., Firor, W. M., and Self, W. O., *Acta Union Internationale Contre le Cancer*, 1948, in press.