observed that twice as many takes occurred in male as in female rabbits following transplantation of a spontaneous tumor into the anterior chamber of the eye; moreover, Greene found that all grafts which progressed to the extent of corneal invasion occurred in males.

Summary and Conclusion. Following intraperitoneal inoculation of small doses of sarcoma S 37, 89 of 101 males (88%) developed tumors, as compared with 65 of 110 females (59%). This difference in resistance between males and females was completely abolished by larger doses of sarcoma, which produced tumors in 102 of 108 males (94%) and in 108 of 114 females (95%).

Tumors produced by intraperitoneal inoculation of sarcoma were uniformly fatal and in no instance was spontaneous regression of such a tumor observed.

Comparison of these results with those obtained by intradermal inoculations of sarcoma S 37[1] suggests that careful dosage of the tumor-cell suspension and the route of inoculation are most important in demonstrating the influence of sex on resistance to transplantable neoplasms. Neither of these factors has been stressed sufficiently, heretofore, in studies on the evolution of implanted tumors in different sexes.

13467 P

Experimental Atherosclerosis and Soya Lecithin.*

HOMER D. KESTEN AND RUTH SILBOWITZ.

From the Department of Pathology, College of Physicians and Surgeons, Columbia University, New York City.

The well established lipotropic property of lecithin in the prevention of fatty livers and the partial protection apparently afforded by soy bean flour against cholesterol-induced atherosclerosis in rabbits,[2] suggested the investigation of the effect of soya lecithin on experimental atherosclerosis. Accordingly 23 young adult chinchilla rabbits were divided into 3 groups. All were fed 150 mg of cholesterol daily in oil added to a basic diet consisting of white flour, alfalfa, linseed meal, carrots and salt mixture.[1] Group A received nothing more. Rabbits of Groups B and C received 5 g and 1 g respectively in the diet daily of crude soya lecithin (approxi-

* This work has been aided by a grant from the American Lecithin Company, Inc.

mate composition: lecithin 20%, cephalin 20%, oil 30%, phytosterols 2%, inositol and allied compounds 15%, carbohydrates 10%). The oil content of the several diets was adjusted to equality. The rabbits were killed after 4 months of feeding and the aortas and viscera examined, both grossly and histologically.[1]

Table I indicates the findings. Seven of the 8 animals receiving cholesterol alone developed atherosclerosis of the aorta (for the most part of moderate degree). Only 2 of the 7 in Group B that received the addition of 5 g of soya lecithin daily developed lesions (of minimal degree), and 2 of the 8 in Group C that consumed 1 g of lecithin. The average level of blood cholesterol of the rabbits, in Group A, attained 430 mg (± 150) per 100 cc, in Group B (5 g lecithin) 210 mg (± 75), and in Group C (1 g lecithin) 300 mg (± 100). The livers of all the rabbits were normal grossly and histologically.

How much of this protective effect of lecithin on cholesterol deposition is due to choline is problematical. Choline has been found by Steiner,[2] Baumann and Rusch,[3] and Himsworth[4] to have no effect on the hypercholesterolemia of cholesterol-fed animals. Baumann and Rusch, and Himsworth reported also no effect on cholesterol deposition in the aorta, but Steiner observed a delay in the production of atherosclerosis. A 4th group of rabbits received 195 mg of choline chloride per rabbit per day (equivalent to the choline content of 5 g of crude soya lecithin). The incidence of atherosclerosis was sharply less than in the animals receiving cholesterol alone, but only a little greater in degree than in the groups fed lecithin. However, hypercholesterolemia in this group [340 mg (±160) per 100 cc] was more severe than in the animals receiving 5 g of lecithin daily. It

TABLE I.
Effect of Soya Lecithin on Cholesterol Sclerosis.

Diet	Rabbits			Degree of sclerosis of aorta	
	No. used	No. sclerotic	Percentage sclerotic	+	++
A. Basic	8	7	88	2	5
B. Lecithin 5 g	7	2	28	2	0
C. " 1 "	8	2	25	1	1
D. Choline	8	3	38	1	2

\+ No lesion visible grossly, or doubtful, but one was evident microscopically.
++ Sclerosis evident grossly as one to several atheromatous plaques.

1 Meeker, D. R., and Kesten, H. D., *Arch. Path.*, 1941, **31**, 147.

2 Steiner, A., PROC. SOC. EXP. BIOL. AND MED., 1931, **38**, 231.

3 Baumann, C. A., and Rusch, H. P., PROC. SOC. EXP. BIOL. AND MED., 1938, **38**, 647.

4 Himsworth, H. P., *Acta Med. Scand. Suppl.*, 1938, **90**, 158.

seems likely that, with this high blood cholesterol, the animals fed choline would shortly have developed more extensive atherosclerosis. Further work is needed to clarify this point.

Summary. The feeding of soya lecithin to rabbits receiving cholesterol restricts hypercholesterolemia and diminishes the incidence of experimental arteriosclerosis.

13468 P

Nerve Concussion.

A. D. KREMS, GORDON M. SCHOEPFLE AND JOSEPH ERLANGER.

From the Physiological Department, Washington University School of Medicine, St. Louis.

Recent observations[1] indicate that typical cerebral concussion is best reproduced in unconscious animals by subjecting the head to a sufficiently high rate of change in velocity. The response is an immediate muscle "start reflex" followed at once by relaxation and abolition of reflexes (but with continuing discharge from reflex centers) lasting up to 60 seconds; recovery (or death) may occur within a period of 5 minutes.

In the present experiments a short segment of the sciatic nerve of the green frog is compressed by a blast from an air pistol. The segment exposed to the blast lies on a solid foundation at the bottom of a pit 3.6 mm wide and about 4 mm deep into which the air is shot. "Maximal" induction shocks delivered to the nerve centrad to the compressed segment test the degree of the resulting conduction block, either in terms of contraction height, when the muscle (gastrocnemius) remains attached, or in terms of area of the monophasic action potential when the nerve responses are recorded with the cathode ray oscillograph. "Maximal" shocks delivered to the nerve distad to the compressed locus control the condition of the nerve beyond the pit, and of the muscle.

A blast that blocks, either partially or completely, may elicit a maximal twitch of the muscle due to the mechanical stimulation of the nerve. Testing shocks applied immediately thereafter reveal a reduction, it may be to zero, in the height of the contraction or of the spike. The test contractions or spikes then almost immediately

[1] Denny-Brown, D., and Russell, W. R., *Brain*, 1941, **64**, 93.