periments the utilization of food was apparently unaffected by considerable variation in the amounts of B_1 and B_2 furnished in the supplements.

On the other hand, the appetite of the rats was markedly affected by the nature of the supplement. If either tikitiki (B_1) or autoclaved liver (B_2) was used as the source of the B complex appetite failed and growth did not occur. However, the combination of tikitiki and autoclaved liver resulted in optimum growth (Group 12); i. e., growth as good or better than that of the stock control rats (Group 5). The difference between Groups 6 and 7 and between Groups 11 and 12 was largely due to the appetite-stimulating effect of the autoclaved liver. A similar effect, due to B_1, was evident in the increased food consumption resulting from the partial substitution of yeast for liver in Groups 8, 9 and 10.

Although the factor in autoclaved liver may not be as necessary as the factor in yeast for efficient utilization of ingested food,[1] nevertheless, its effect on appetite was of importance in bringing about optimum growth on the purified diet. The experiments indicated that the influence of the antineuritic vitamin (B_1) on appetite may not be as specific as was suggested by Sherman and Sandels.[2] Burack and Cowgill[3] concluded from experiments on dogs that either the antineuritic vitamin was the sole appetite factor or another substance, not vitamin G (B_2), was required to supplement the antineuritic factor. Our own experiments emphasize the importance for normal appetite of *both* the antineuritic vitamin *and* another factor which is found in autoclaved liver.

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Effect of Splenectomy and of Other Surgical Procedures upon Circulating Blood Platelets (Rabbits).

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It is a well established fact that splenectomy in the normal ani-

[1] Griffith, W. H., and Graham, C. E., PROC. SOC. EXP. BIOL. AND MED., 1929, **26**, 862.

[2] Sherman, H. C., and Sandels, M. R., *J. Nutrition*, 1931, **3**, 395.

[3] Burack, E., and Cowgill, G. R., PROC. SOC. EXP. BIOL. AND MED., 1931, **28**, 750.

mal is usually followed by a considerable increase in the number of blood platelets. Largely on the basis of this fact the theory of the thrombolytic function of the spleen has been generally adopted. This theory was supported by the clinical observation of Kaznelson[1] that in purpura hemorrhagica, removal of the spleen was followed by an immediate increase of platelets and disappearance of purpuric hemorrhages. He assumed, therefore, that in this disease there was an overwhelming destruction of platelets in the spleen and suggested the name "splenogenous thrombolytic purpura." Most of the observational evidence in splenectomy in humans has supported Kaznelson's theory. Conclusions drawn from this kind of observation, however, are hazardous as there are so many unknown and uncontrollable factors involved.

Moreover, it has been frequently observed that platelets are increased in number after other operations. The results of extensive clinical observations of this kind were published by Dawbarn, Earlam and Evans.[2] Bachman and Hultgren[3] concluded from experiments on rabbits that all operative procedures involving considerable trauma to tissues are followed by an increase in blood platelets but that the thrombocytosis induced by splenectomy is greater and of longer duration. Liles[4] observed that a group of rabbits, each of which had been the recipient of a transplanted spleen, showed an even greater increase in platelets than a group from which the spleens had been removed. On the tenth day the 2 groups showed the same platelet level but the level was sustained for a longer time in the splenectomized animals than in the recipients. He attributed the initial rise in both groups to traumatism.

The present experiments were carried out in an attempt to answer the question of the specificity of the effect of splenectomy upon blood platelets. Does removal of the spleen in the rabbit affect the platelet level to a greater degree than other operations involving a similar degree of trauma, or is the effect simply that of tissue injury in both instances?

The animals used were young rabbits weighing from 1390 to 2225 gm. at the time of the first operation. After a control period of a few days (usually 5) during which daily leukocyte, erythrocyte and platelet counts were made, the animals were prepared by clip-

[1] Kaznelson, P., *Wien. klin. Wochenschr.*, 1916, **29**, 1451.

[2] Dawbarn, R. Y., Earlam, F., and Evans, W. H., *J. Path. and Bact.*, 1928, **31**, 833.

[3] Bachman, E. L., and Hultgren, G., *Compt. rend. Soc. de biol.*, 1926, **94**, 942.

[4] Liles, R. T., PROC. SOC. EXP. BIOL. AND MED., 1926, **23**, 489.

ping the hair and cleansing with green soap and water. Shaving and iodine were omitted because of the influence of skin irritation upon the platelets.[5] The pre-operative preparation and etherization were found to have no appreciable influence upon the platelet level. The technique for counting blood platelets has been described in previous publications.

Table I (A and B) shows the results of splenectomy in 13 previously unoperated animals. The spleen was delivered through an incision in the abdominal wall parallel to and just below the ribs. In the first 5 animals (Table I A) the pedicle of the spleen was clamped off with artery forceps before the spleen was cut away.

TABLE I. Splenectomy.

A.

Rabbit No.	Wt. gm.	Platelets—thousands per cu. mm.				Post-op. day
		Normal average	Normal maximum	Experimental maxim.	Increase %	
18	1530	654	697	1,668	155	3
19	1540	908	958	1,652	82	2
21	2132	911	1,197	1,886	107	4
30	1760	570	578	1,512	165	3
31	1758	878	887	1,587	81	5
				Average	118	

B.

36	1811	986	1,015	1,411	43	4
38	1754	806	888	1,381	65	4
41	1642	644	756	1,096	70	6
73	1465	646	691	984	52	4
75	2185	771	861	1,214	57	4
76	1955	704	828	1,392	98	4
77	1825	777	813	1,263	63	4
82	1560	760	842	1,546	103	5
				Average	69	

Three of these 5 gave the highest platelet counts obtained in the entire series (No. 30, 164.8%; No. 18, 154.9%; No. 21, 106.9%). The average percentage increase for the 5 was 117.8%. In subsequent operations (8 rabbits) clamps were not used. The splenic vessels were ligated with silk and the spleen clipped away, with care to avoid injury to the pancreas. The average platelet increase for this sub-group (1 B) was 69.0%. The average increase for the entire group of 13 splenectomized rabbits was 87.8%.

Table II shows the effect of control operations in 8 previously unoperated rabbits. In these operations an incision was made in the abdominal wall just as in the operations for splenectomy;

[5] Steiner, P. E., and Gunn, F. D., *Arch. Path.*, 1931, **11**, 241.

TABLE II. Control Operation.

Rabbit No.	Wt. gm.	Platelets—thousands per cu. mm.				Post-op. day
		Normal average	Normal maximum	Experimental maxim.	Increase %	
74	2225	637	853	959	50	3
80	1665	685	730	1,127	64	4
81	1490	731	834	1,185	62	3
83	1440	526	677	1,104	110	5
85	1560	601	654	1,315	119	5
88	1630	767	799	881	15	4
89	1670	736	793	1,057	44	4
90	1380	568	625	863	52	3
				Average	64	

sutures were placed through the pedicle of the spleen and loosely tied, avoiding the inclusion of any blood vessels in the ligatures. In this group the average increase in platelets was 64.5%; the greatest was 118.6%; the least was 14.8%.

TABLE III. Splenectomy Followed by Control Operation.

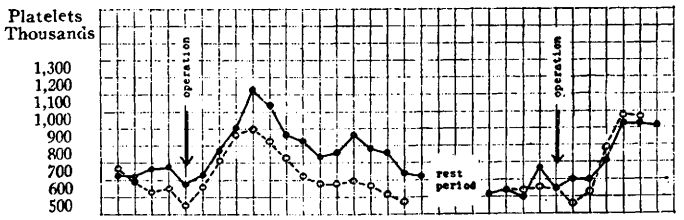
Rabbit No.	Splenectomy			Interval in weeks	Control Operation		
	Wt. gm.	% increase	Day of maximum		Wt. gm.	% increase	Day of maximum
73	1465	52	4	9	1890	34	4
75	2185	57	4	7	2670	112	6
77	1955	63	4	8	2855	30	4
82	1560	103	5	4	1805	93	4
	Average	68.9			Average	67.2	

In the third group of experiments (Table III) splenectomy was done and an average platelet increase of 68.9% was obtained. After an interval of from 4 to 9 weeks during which the blood picture remained practically normal, a control operation was done upon each of the 4 animals. These operations were followed by an average increase of 67.2%.

TABLE IV. Control Operation Followed by Splenectomy.

Rabbit No.	Control Operation			Interval in weeks	Splenectomy		
	Wt. gm.	% increase	Day of maximum		Wt. gm.	% increase	Day of maximum
74	2225	50	3	10	2610	24	4
80	1665	64	4	5	2045	83	4
81	1490	62	3	4	1755	29	4
83	1440	110	5	4	1705	105	5
	Average	71.8			Average	75.3	

Comparison of Effects of Splenectomy and Control Operation.



Solid line—splenectomy followed by control operation.
Broken line—control operation followed by splenectomy.
FIG. 1.

In the fourth group of rabbits (Table IV) the above procedures were reversed. The first, or control, operations yielded an average increase of platelets of 71.8%. The subsequent splenectomies gave 75.3% increase.

The results of the third and fourth groups of experiments just described are shown graphically in Fig. 1. The composite of the daily platelet counts of animals of group III, in which splenectomy preceded the control operation, is represented by a solid line. The composite of the counts of group IV, in which the control operation preceded splenectomy, is represented by a broken line. Although splenectomy in both cases gave a slightly higher average platelet level than the control operation, we do not regard the differences as significant, especially since the average normal in group III was higher than that of group IV.

During the first 4 groups of experiments it became increasingly apparent that the degree of thrombocytosis bore a definite relation to the amount of trauma sustained by the tissues. This theory was tested as follows: First, one of the rabbits of group III (No. 73) which had shown an increase of 52.3% of platelets after splenectomy and 33.7% after reincision and the placing of sutures in the peritoneum, was subjected to another "control" operation, designed to produce still greater trauma, namely, the crushing and removal of the end of the caecum through an 8 cm. midline incision. This was followed by an increase of 77.8%. Next, one rabbit was operated upon with the least possible trauma. A 4 cm. incision was made, the spleen was handled as gently as possible and sutures were placed in its peritoneal attachment. These were not tied. The spleen was allowed to drop back at once and the wound closed. In this case the increase of platelets was only 16.3% on the fourth postoperative day when the maximum was reached. On the fifth day the platelet level had already returned to normal. Eight days

after the first operation a partial removal of the caecum was performed through an 8 cm. incision. The response to this operation was an increase of 82.0% on the fourth day.

Conclusions. Removal of the spleen in rabbits is followed constantly by an increase in the number of circulating blood platelets. Other operations involving a similar degree of trauma are followed by an increase of platelets which does not differ in time of occurrence, degree or duration from that observed after splenectomy. The degree of the rise depends upon the amount of trauma sustained by the tissues.

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Fate of Poliomyelitis Virus in the Brain After Intracerebral Inoculation of Normal and Convalescent Monkeys.*

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The fate of poliomyelitis virus in the brain after intracerebral inoculation of normal monkeys has recently been studied very carefully by Fairbrother and Hurst.[1] These authors find the virus regularly present at the site of inoculation until the fifth day after infection, when the infectious agent suddenly disappears from the portal of entry on its way to further invasion of the more distant parts of the central nervous system. This critical point in the development of the disease, suggesting the operation of some autosterilizing mechanism in the infected brain tissue, apparently coincides with the first febrile response. The work of the above mentioned authors suggested a comparison of the survival of the virus after intracerebral inoculation in the normal monkey brain with the rate of disappearance from the site of inoculation in convalescent monkeys, immune through spontaneous recovery from the disease.

Six normal monkeys were inoculated intracerebrally with 1 cc. of a 10% virus cord emulsion, the potency of which was proved by simultaneous infection of several controls. By using a very

* Under a grant from the International Committee for the Study of Infantile Paralysis, whose work is being financed by Jeremiah Milbank.

[1] Fairbrother, R. W., and Hurst, E. W., *J. Path. and Bact.*, 1930, **33**, 17.