definitely significant. This confirms the fact that the difference between the mean incubation periods of the 2 groups is real.

The incidence of takes by strains 1, 5, 7, 8, and 9 was 62.9%. Inclusion in this series of the unusually high number of takes in Group II (Table I) raises this figure to 64.9%, while the incidence of the older strains reaches 90.6%. The older strains, therefore, appear to be more consistently infectious for the rabbit than the newer strains.

Conclusions. A comparative study has been made between the infectivity of 2 groups of *Treponema pallidum*, 9 new and 4 older strains. The mean of incubation of the newer group varied from 30 to 44 days, while that of the older group varied from 24.75 to 33.85 days. Statistically, both groups appeared to be homogeneous in themselves and the incidence of takes for the newer strains was 64.9%, while that of the older strains 90.6%, a difference of 25.7%. These findings indicate adaptation of the organism to its new host and should be considered in all work in experimental syphilis.

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A Species Limitation of an Enhancing Material Derived from a Mammalian Tumor.

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In an effort to differentiate the material derived from the Brown-Pearce rabbit tumor[1] from other enhancing materials it seemed desirable to know whether it would enhance various diseases and tumors, both in the same and in different species. To this end a series of experiments was made with a Bashford mouse carcinoma (No. 63).* The experiments were distributed at approximately 6 weeks intervals between January, 1932, and January, 1933, each experiment consisting of 30 mice divided into 3 groups of 10. Enhancing material prepared from Brown-Pearce tumor tissue[1] and enhancing material prepared in an entirely similar manner from

[1] Casey, A. E., PROC. SOC. EXP. BIOL. AND MED., 1932, **29**, 816; *J. Exp. Med.*, in preparation.

* The experiments with the Bashford tumor were carried out in the laboratory of Dr. Jas. B. Murphy at his kind invitation. The other experiments on the enhancing material derived from the Brown-Pearce tumor were done in the laboratory of Dr. Wade H. Brown.

the Bashford tumor itself were injected subcutaneously into the left groins of the animals of Groups 1 and 2 respectively. No tumor growths resulted. Twelve to 18 days later the animals of these 2 groups together with those of the third, not previously injected, were inoculated with grafts (Exps. 1-6) or with a saline emulsion (Exps. 7-10) of fresh Bashford tumor tissue (Table I).

TABLE I.
Summary of Data on *Material and Methods.*

Exp. No.	Bashford Preserved Material				Brown-Pearce Preserved Material				Interval between inoculation and re-inoculation days
	Age of Tumor Selected days	Temp. Ice-box	Days Preserved	Dose	Temp. Ice-box	Days Preserved	Dose	Mice Strain	
1	20	32°	10	.5	26°	60	.5	Rckf. Inst.	12
2	23	32°	10	.5	—	—	.5	"	12
3	21	32°	10	.5	28°	90	.5	"	12
4	52	32°	28	.5	28°	85	.5	"	13
5	35	32°	40	.5	28°	57	.5	"	12
6	35	32°	40	.5	28°	57	.5	"	12
7	42	24°	21	.3	24°	44	.3	"	15
8	42	24°	35	.3	24°	58	.3	Swiss	15
9	42	24°	50	.1	24°	72	.1	Rckf. Inst.	16
10	42	24°	68	.1	24°	90	.1	Swiss	18

Observations were made on the incidence and the size of the primary tumors resulting. Of the 97 mice treated with the rabbit tumor material 46 (47.4%) had primary tumors at 21 days† as compared with 57 (57.5%) among the 99 control mice and 67 (67%) among the 100 mice treated with material from the Bashford tumor itself. Such an excessive variability would not be expected to occur by accident more often than twice in 100 similar experiments with 300 mice (x^2—7.7, n—2, P—0.02). Treatment of the mice with the rabbit tumor material seemed to result in fewer takes, while treatment of the mice with the mouse tumor material seemed to result in an increased number of primary tumors, the difference between the 2 series being significant when compared directly (x^2—7.7, n—1, P—0.01—).

The mean size of the 46 primary tumors among the mice treated with the rabbit tumor material was 1.77 cc. and that of the 57 tumors among the controls 1.54 cc., while that of the 67 tumors among the mice treated with the homologous mouse material was 3.16 cc. There was no significant difference between the size of the primary tumors of the first 2 groups (s_d—0.29, t—0.79, P—0.42) but a very significant difference between each of these and the size

† The observations at 21 days were selected from the weekly observations available because of the frequency of deaths after this period.

TABLE II.
Summary of Results by Groups.

Exp. No.	Incidence of Primary Tumors			Vol. Primary Tumor in Mice with Tumor			Vol. Primary Tumor per Animal Inoculated		
	B.P.XYZ	Cont.	Bash.XYZ	B.P.XYZ	Cont.	Bash.XYZ	B.P.XYZ	Cont.	Bash.XYZ
	%	%	%	cc.	cc.	cc.	cc.	cc.	cc.
1	44	78	50	1.0	1.2	3.8	0.5	0.9	1.9
2	10	10	30	4.6	0.4	0.2	0.5	0.0	0.1
3	30	60	80	0.9	1.7	2.1	0.3	1.0	1.7
4	50	70	90	1.0	1.3	5.1	0.5	0.9	4.6
5	50	80	90	1.7	1.0	2.2	0.9	0.8	2.0
6	30	30	50	0.6	0.7	1.4	0.2	0.2	0.7
7	70	60	60	1.7	2.0	2.6	1.2	1.2	1.5
8	90	80	90	3.0	3.1	5.9	2.7	2.5	5.3
9	40	30	30	1.8	0.6	4.3	0.7	0.1	1.3
10	63	80	100	1.7	1.4	2.0	1.1	1.1	2.0
Mean for Groups	47.7	57.8	67.0	1.8	1.3	3.0	0.8	0.9	2.1
Mean for Individuals	47.4	57.5	67.0	1.8	1.5	3.2	0.8	0.9	2.1

B.P.XYZ—Mice treated 2 weeks previous to the regular inoculation with fresh Bashford tumor with enhancing material derived from the Brown-Pearce tumor.

Controls—Mice inoculated with fresh Bashford tumor only.

Bash.XYZ—Mice treated with enhancing material derived from the Bashford tumor itself 2 weeks previous to the regular inoculation with fresh Bashford tumor.

of the primary tumor among the mice treated with the homologous mouse tumor material (s_d—0.37, 0.34, t—3.8, 4.8, P—0.01—). The enhancing material from the Brown-Pearce rabbit tumor, therefore, possibly diminished the incidence but had no significant effect on the size of the Bashford primary tumor while the enhancing material obtained from the same Bashford tumor enhanced both the incidence and the size of the primary tumors, the mean size of the primary tumors being twice that of the controls. Postmortem examination of mice found dead and of surviving mice 30-55 days after inoculation revealed no metastases visible to the unaided eye.

The conclusions to be drawn are that a rabbit tumor material which greatly enhanced both the primary and the metastatic phases of the same tumor of the rabbit (the Brown-Pearce tumor) failed to enhance either the primary or the metastatic phase of a Bashford carcinoma (No. 63) of the mouse. Material derived from this latter, however, had a noteworthy enhancing effect on growths of the same sort.‡ It should be remarked that the enhancing material

‡ That this Bashford tumor contains an enhancing material which enhances both the incidence and the size of the primary tumor (no mention was made of metastases) confirms the findings of Haaland (*Lancet*, 1910, **1**, 787) and of Leitch (*Lancet*, 1910, **1**, 991).

from the Brown-Pearce tumor, a growth which normally produces metastases, enhanced both the incidence and the development of metastases in this disease, and that the enhancing material from the Bashford tumor which ordinarily does not produce metastases did not cause the occurrence of metastases recognizable in the gross. The enhancing materials derived from two mammalian tumors seemed to conform to type and one at least is limited in its activity.

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Traumatic Shock in Adrenalectomized Rats.

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It is well known that an adrenalectomized animal is susceptible to a much smaller dose of a poison than a normal animal. The drugs which have been used in this work are many and quite unrelated. They include histamine (Dale[1]), morphine and bacteria (Scott[2]), and many others (Lewis[3]). Wyman and Tum Suden,[4] however, feel that histamine is fatal in small doses because of absence of the medulla and that intraperitoneal injections of epinephrine can protect against fatal doses of histamine. Nevertheless, cortical extracts are much more effective than epinephrine in this rôle (Marmorston-Gottesman and Perla[5]). Likewise cortical extracts are capable of protection in adrenalectomized animals against fatal doses of typhoid vaccine (Scott and Bradford,[6] Perla and Marmorston-Gottesman[5]).

The sensitivity of adrenalectomized animals to histamine seems a very significant relationship inasmuch as many common serious clinical conditions are assumed to be the result of histamine poisoning. It has been generally accepted from the work of Cannon,[7]

[1] Dale, H. H., *Brit. J. Exp. Path.*, 1920, **1**, 103.

[2] Scott, W. J. M., *J. Exp. Med.*, 1923, **38**, 543; 1924, **39**, 457.

[3] Lewis, J. T., *Am. J. Phys.*, 1923, **64**, 506.

[4] Wyman, L. C., Tum Suden, C., *Am. J. Phys.*, 1932, **99**, 285.

[5] Marmorston-Gottesman, J., and Perla, D., PROC. SOC. EXP. BIOL. AND MED., 1931, **28**, 1022.

[6] Scott, W. J., and Bradford, W. L., PROC. SOC. EXP. BIOL. AND MED., 1931, **28**, 428.

[7] Cannon, W. B., *Compte rend. Soc. Biol.*, 1918, **81**, 850.