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Failure to Transmit Carcinogenic Agents from the Pregnant Mouse Embryos in utero.

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Several investigators have reported transmission in mice of carcinogenic agents from mother to embryo. One group of such investigators believes that a mash of embryos which have developed in the body of a cancerous mother, can transmit cancer on transplantation in other mice. A diagram of this type of relationship is given in Fig. 1.

It is evident that if a highly specific and effective degree of carcinogenic activity were transmitted in the way described it would be definite proof of the existence of such an agent smaller than and separable from the cell. Since the larger mass of evidence in rodent tumors argues against the probability that such a condition exists, it seemed worth while to make certain experiments along this line.

As far as possible the technique described by Tesauro[1] was followed.

In any mice which showed masses at the site of transplanted embryonic tissue, observations by palpation were made at frequent intervals. The size of masses was indicated by an outline of their approximate area recorded on a chart kept for each animal. In each case histological preparations were made of the masses which persisted. Study of these preparations showed the masses were either teratoid or inflammatory in nature. In no case did a mass resemble the original tumor employed. Similar inflammatory or teratoid growths were obtained in many control animals inoculated with an emulsion of embryo from non-cancerous mothers. The results of the various experiments are given, in a condensed form in Table I. In no case was a malignant tumor obtained in either experimental or control animals, as a result of inoculation with embryonic tissue.

Although negative results are never entirely satisfactory it seemed worth while to record the fact that the results obtained by Tesauro are not universally applicable and that the principle which is involved remains, in so far as our experience is concerned, unestablished.

In this connection it is of interest to note that where a tumor was used, the mice receiving transplants of the embryonic mash were

[1] Tesauro, G., *Z. f. Krebsforsch.*, 1931, **35**, 109; *Boll. d. Soc. ital. di biol. spec.*, 1932, **7**, 332; *Arch. di Sc. biol.*, 1932, **17**, 48.

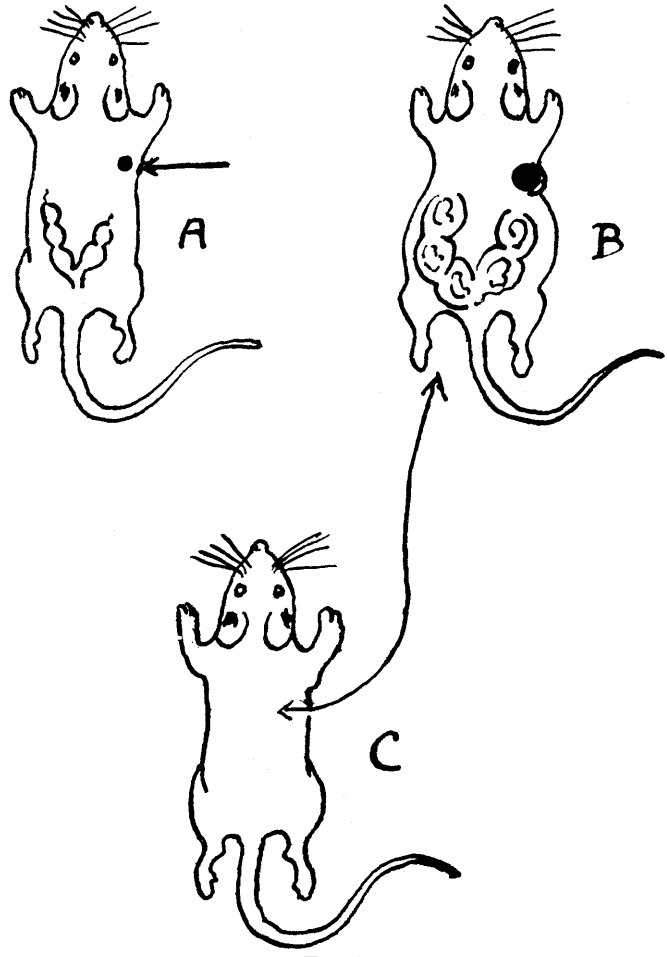

FIG. 1.

A. Early pregnant mouse inoculated with cancer as indicated by arrow.
B. Same mouse later. Tumor has grown. Embryos, with head, tail and limbs removed, are made into emulsion and inoculated into mouse C.
C. Non-pregnant, non-cancerous mouse which receives implant of embryonic emulsion in the site indicated by arrow. This mouse is supposed to grow a tumor of original type (A) at the site of implantation.

of the proper constitution to grow the tumor had the stimulus been provided.

It is also important to point out that sarcoma M 37 was the same tumor used by Tesauro in several of his experiments. It is therefore clear that this tumor does not, under various conditions, behave in the same way as regards the experimental technique under investigation.

TABLE I.

Exper.	Tumor	Pregnant ♀ receiving tumor	Date 1934	Killed and emulsion made	No. receiving crushed embryo	Growing masses	End of experiment	Duration of exper. days
A	Sarc. 15091a	No. 3934	2-16	2-23	1	0	3-25	37
B	"	No. 4012	2-16	2-24	3	3	3-25	37
C	Carc. F_1 R_4*	No. 3763	2-26	2-26	4	4	3-25	27
D	Carc. d Br B	No. 3933	2-16	2-26	9	9	3-25	37
E	"	No. 4276	2-16	2-27	6	5	3-25	37
F	Control	No. 3860	3-12	3-12	5	5a	3-25	13
G	"	No. 4398	3-12	3-12	4	4a	3-25	13
H	Sarc. M37	No. 3877	3-14	3-20	12	3	5-4	51
I	"	No. 4710	8-27	9-6	6	1	10-11	35
J	"	No. 5456	8-27	9-6	6	0	10-11	35

* Spontaneous tumor observed in pregnant ♀.

a The masses in the controls were as large or larger than those in the experimental animals and were histologically indistinguishable from them.

Conclusion. In view of the negative results herein reported it would seem that a larger series of tumors with more detailed and more enlarged photographs of the induced tumors should be available before the principle of transference from mother to embryo of a cancer-producing agent can be considered as established.

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Effect of Poliomyelitis Virus in Baby Monkeys Previously Given Paratyphoid Colon Filtrate and Vaccine.*

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The addition of paratyphoid colon bacillus filtrate (previously termed enteric toxin) to poliomyelitis virus accelerated the production of the disease.[1] What would happen if monkeys *(Macacus rhesus)* were injected with this filtrate as well as with a vaccine made from the organisms that produced it? Adult monkeys have shown some agglutinins for the typho-paratypho-colon group, therefore, young monkeys were chosen for this experiment, since their blood serums contained little or no agglutinins for this group of organisms.[2]

Paratyphoid and colon bacilli were grown in 0.5% glucose broth and after 10 days the media were centrifuged, the organisms combined, autoclaved, and were called the vaccine; the supernatant fluid was passed through a mandler N and W filter and called the P.C.B. filtrate (enteric toxin). Massive doses of the filtrate and vaccine were injected subcutaneously into 3 of 6 baby monkeys within from 2 to 3 months after they had been weaned. The animals, weighing from 890 to 1104 gm., were obtained in September of 1933 and were injected as follows: 10-6-33, 0.25 cc. vaccine; 10-10-33, 0.5 cc. vaccine; 10-17-33, 1.0 cc. vaccine; 10-20-33, 1.0 cc. vaccine; 10-24-33, 1.5 cc. vaccine; 10-30-33, 1.75 cc. vaccine; 11-3-33, 2.0 cc. vaccine; 11-11-33, 2.0 cc. vaccine; 11-20-33, 2.0 cc. filtrate; 11-28-33, 2.0 cc. filtrate; 12-6-33, 3.0 cc. filtrate; 12-13-33, 2 cc. vaccine;

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1 Toomey, John A., PROC. SOC. EXP. BIOL. AND MED., 1934, **31**, 1015.

2 Toomey, John A., *J. Inf. Dis.*, 1934, **54**, 74.