TABLE III. Influence of Insulin, Glucose, and Pituitary Powder on Oxygen Consumption (ml/g/day) on 5 Alligators.

Body wt, g	Control	Insulin	Glucose	Pituitary powder
114	1.08	1.29	1.32	1.33
107	.96	1.11	1.18	1.24
170	1.49	1.31	.94	1.22
92	1.37	1.41	1.38	1.54
73	1.90	1.88	1.97	2.56
Avg 111	1.36	1.40	1.36	1.58

TABLE IV. Influence of Prolonged Administration of Desiccated Thyroid and Pituitary Powder on Oxygen Consumption.

	No. alligators	Avg body wt	Ml O_2/g/day, avg and range
Control	5	42	1.73 (1.26–2.00)
Thyroid	10	42	1.83 (1.06–2.38)
Pit. powder	5	45	2.20 (1.83–2.70)

as controls. Unfortunately the pituitary powder was toxic enough to kill 5 of the 10 in that series before the oxygen studies were conducted. At the conclusion of the periods of injection oxygen consumption was measured on each of the alligators for 3 successive days. To make the experiment more nearly comparable to the one presented in Table III the lowest oxygen consumption of the first 2 runs was used to compute the averages shown in Table IV. Again it appears that pituitary powder produces an increase in metabolism in the alligator. It is questionable whether thyroid powder in the quantity injected is instrumental in producing much change in the metabolic rate in spite of the fact that the dosage employed is several times that required to produce an effect in a mammal.

Summary. Although alligators are quite active in the winter if the temperature is high they have a pronounced hypoglycemia and no appetite. There is no seasonal change in metabolic rate in either the alligator or caiman. The caiman does not hibernate. Pituitary powder produces prolonged hyperglycemia and increases the metabolic rate. Desiccated thyroid powder has no effect on blood sugar. Neither glucose nor insulin had any effect on metabolic rate.

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Effect of Parahydroxypropiophenone on Experimental Ovarian Tumors in Rats.* (19303)

DONALD E. BERNSTEIN AND GERSON R. BISKIND.
From the Department of Pathology, Mount Zion Hospital, San Francisco, Calif.

Experimental gonadal tumors have been developed in this laboratory by transplantation of a gonad into the spleen of castrated animals(1,2). Since it is postulated that the pituitary of such an animal is subjected to decreased gonadotrophin inhibition, it would follow that excessive or uninhibited pituitary gonadotrophin production is probably a factor of prime importance in the formation of these tumors. The fact that exogenous gonadotrophins will accelerate such tumor formation(3), lends credence to the validity of this hypothesis.

The present work was undertaken to investigate the property of non-estrogenic pituitary inhibition(4,5) attributed to parahydroxypro-

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TABLE I. Twelve Female Castrate Rats With an Ovary Transplanted to the Spleen Fed 100 mg Parahydroxypropiophenone Daily.*

Days	Wt (g) Initial	Wt (g) Final	Size of transplant, mm
13	139	135	2 × 1
20	142	149	1
42	139	151	1
50	158	184	—
91	232	225	4
101	192	184	5 × 3
125	175	200	2 × 1
130	157	183	1 × 2
140	196	210	2 × ½
160	186	190	5 × 3
183	177	190	2 × 2
200	192	240	1

* All rats showed uterus with hyperplasia and/or squamous metaplasia of endometrium, and vagina showed cornification.

TABLE II. Five Female Castrate Rats With an Ovary Transplanted to the Spleen Fed 100 mg Parahydroxypropiophenone and 18 mg Thyroid Daily. See footnote Table I.

Days	Wt (g) Initial	Wt (g) Final	Size of transplant, mm
10	134	152	1
20	170	172	2 × 3
30	177	193	3 × 3
52	141	—	2
80	152	144	1

piophenone† since it was felt that such a substance should suppress the formation of the experimental ovarian tumors by inhibiting the production of pituitary gonadotrophins.

Method. Twenty-seven young adult female rats of the Long-Evans strain were given 100 mg daily of parahydroxypropiophenone in their diet, which consisted of Purina chow and water *ad libitum*. They were divided into 4 groups: (A) 12 castrated animals in which one ovary was transplanted to the spleen; (B) 5 castrated animals with one ovary transplanted to the spleen, which, in addition, received 18 mg daily of thyroid extract in their diet; (C) 6 castrated animals; and (D) 4 intact animals. Since previous reports claimed that parahydroxypropiophenone inhibited thyrotrophin(4), Group B was included to negate any changes that could be attributed to thyroid deficiency. The rats were sacrificed at intervals varying from 13 to 200 days, and complete autopsies were performed. In addition to the animals listed in Tables I and II there were 11 other animals in which adhesions developed from the spleen to the systemic circulation and these served as controls.

Results. In the intact animals vaginal smears showed that they entered into an estrus phase in 5 days and remained in that state for the experimental 90-day period. In all the animals in this experiment histologic examination of the uterus and vagina showed estrogenic stimulation characterized by hyperplasia and squamous metaplasia of the endometrium of the uterus, or severe vaginal epithelial cornification. (See Tables I-III). The ovarian transplants were dwarfed in size, none grew larger than 5 x 3 mm, and they were composed of small clusters of developing follicles with an occasional corpus luteum. There was no evidence of proliferation of the corpora lutea and no suggestion of a luteoma. This description applies to both Groups A and B. The 16 unlisted animals with splenic adhesions showed inhibited growth of the transplant and estrogenic stimulation of the uterus and vagina as described previously(2). Histologic examination of the thyroid gland showed a normal structure in each of the 5 groups.

Discussion. From previous reports(1,2) it has been shown that when an ovary is transplanted to the spleen of a castrated rat a series of proliferative changes occur characterized by the formation of corpora lutea which do not involute but proceed to form a luteoma and eventually a granulosa cell tumor. Such changes may be inhibited either by the addition of exogenous estrogen(6), or when adhesions occur that would circumvent the liver and hence allow estrogen to circulate systemically. In the present experiment the

TABLE III. Female Castrate Rats Fed 100 mg Parahydroxypropiophenone Daily. See footnote Table I.

Days	Wt (g) Initial	Wt (g) Final
17	196	189
55	195	160
55	228	160
62	212	205
70	171	180
76	173	185

† Parahydroxypropiophenone was generously supplied by White Laboratories.

transplanted ovary resembled in size and histologic pattern that seen in those castrate animals that develop adhesions or receive estrogen. As noted in our experiments, not only did the transplants behave as if they were under estrogenic stimulation, but also the uterus and vagina in the castrated Group C had the histologic pattern that results from estrogenic stimulation, which indicates that parahydroxypropiophenone apparently exerted its influence by its estrogenic activity. Group B with added thyroid behaved identically to Group A.

Conclusion. Parahydroxypropiophenone, when fed to castrate animals at a level of 100 mg a day, behaved like an estrogen by producing cornification of the vagina and hyperplasia and metaplasia of the uterine endometrium. Exogenous thyroid had no added effect other than that produced by parahydroxypropiophenone alone. The evolution of experimental ovarian tumors obtained by transplantation of an ovary to the spleen of a castrated rat was inhibited by parahydroxypropiophenone similarly to that reported when estrogens were given or when splenic adhesions circumventing the portal circulation were present.

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Resistance Induced by Alien Strain Mouse Lymphoid Tissue to Lymphosarcoma 6-C3H-ED in C3H Mice. (19304)

E. J. FOLEY. (Introduced by R. Tislow.)
From The Biological Research Laboratories, Schering Corporation, Bloomfield, N. J.

The growth of transplanted tumors as influenced by the previous implantation of tumor cells or other tissues from alien strains of mice or rats has been the subject of much investigation. The literature up to 1929 has been reviewed by Woglom(1). Eisen and Woglom(2) reported protection of rats of strain 990 against the August carcinoma by implantations of embryo tissue from August strain rats, and Sturm(3) showed protection of Wistar rats against transplantable lymphatic leukemia by implantation of embryo or injection of blood from Wistar rats or embryo from Rockefeller Institute hooded rats. Protection of pure strain mice against growth of strain specific tumors (with the exception of certain leukemias) by such procedures has not been reported. Lewis(4) has shown that spindle cell sarcomas arising in inbred mice would grow progressively and kill when implanted in mice of the strain in which they originated. However, when transplanted in mice of alien genetic constitution the tumors regressed after initial growth. The sojourn of such tumors in alien strain mice conferred immunity against subsequent implantation of the same tumor. Implantation of various organs of alien strain mice had no inhibiting effect on the growth of the strain specific tumors. Data of similar significance were presented by Barrett(5). However, MacDowell, *et al.*(6) by prior implantation of embryo tissue from foreign strain mice, found that C58 mice were protected against strain specific transplantable leukemia, and Rhoads and Miller(7) similarly found that AR mice are protected against transplantable leukemia by courses of injections of emulsions of spleen and lymph node cells from the Rockefeller Institute strain of mice given prior to tumor cell implantation.

It was found during the course of studies on the progressive growth of lymphosarcoma 6-C3H-ED in CF1 mice treated with cortisone