In a second group of 118 children there were 80 who had no new cavities and 22 who showed slight evidences of dental disease consisting of 1 to 3 small cavities, none were extensive. The remaining 16 children had defects recorded as questionable caries only. Among the 80 children that had no new caries there were 57 who, at the first examination, had open cavities which were not filled during the year and which did not increase in size.

A group of children in a public school were given Hexylresorcinol as a mouth wash twice daily during a period of 9 months' school term, 5 days per week. No attempt was made to alter the regular home diet. At the end of 9 months it was found that among 104 children there were but 24 who had no caries. In 67 children, or 65%, there were marked evidences of active caries, some of which were quite extensive, the clinical picture being vastly different from that which was observed in the 2 other institutions in which both diet and Hexylresorcinol were used.

The data show that in 2 groups of children the activity of oral *B. acidophilus* was markedly reduced and that dental caries was almost completely arrested by the dietary and therapeutic measures employed. As far as we know, this is the first successful experiment in which dental caries has been so completely eliminated from so large a group of children. It appears that of the 2 methods employed, diet was by far the most active inhibitive force, but it will require other carefully controlled experiments to determine just what parts diet and therapeutic remedies severally play in the prevention of dental caries.

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Effect of Lutein Feeding on the Oestrus of the Guinea Pig.

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In a previous paper, Macht, Stickels and Seckinger described their experiments with injections of *corpus luteum* extracts on the oestrus cycle of guinea pigs, as studied by the vaginal smear method.[1] It was pointed out that injections of such extracts produced an inhibition of the oestrus and were accompanied by characteristic histo-

[1] Macht, Stickels and Seckinger, *Am. J. Physiol.*, 1929, lxxxviii, 65.

logical findings. Inasmuch as a great deal of the earlier work with ovarian endocrines was done by feeding glandular substance to animals and human beings, it seemed desirable to inquire as to whether or not such feeding experiments in the laboratory would be followed by results similar to those obtained with injections. In the present paper a report is made of the results obtained in a series of feeding experiments on guinea pigs performed in this laboratory for a period of about one year.

The method of experimentation was as follows: A series of guinea pigs was carefully studied to establish the duration of their normal oestrus cycle. This was done by microscopic examination of vaginal smears made daily over long periods of time. After determining the length of the oestrus cycle in each case, the guinea pigs were daily fed from 0.1 to 0.2 gm. of desiccated *corpus luteum* substance suspended in fresh cow's milk. Such a suspension can be easily administered to a guinea pig by means of a glass dropper or pipette. The *corpus luteum* substance used was obtained from the sow. Fresh glands were dried *in vacuo* under slightly diminished pressure at a temperature of from 80° to 85° Fahrenheit. The desiccated gland was then powdered and used, the powdered gland being equivalent by weight to about 20 per cent of the fresh gland. Some experiments were also made with the *corpus luteum* powder which was first extracted in a Sohxlet apparatus with ether. The residue thus obtained gave the same results as the original powder. Other animals were fed similar suspensions or solutions in milk of the follicular hormone, and still others were given milk alone. In addition to the daily feeding of the milk suspensions, all the animals received a plentiful supply of green vegetables. After such feedings for periods varying from four to eight weeks, a study of the vaginal smears obtained during that time was again made. The results obtained are exhibited in the subjoined table. In the large majority of cases, it was found that feeding of *corpus luteum* substance was followed by a definite inhibition of the oestrus, as shown by shortening of the oestrus and prolongation of the dioestral period. In the table are indicated the duration of the normal dioestrus, the kind of gland substance administered, and the resultant duration of the dioestrus after feeding it a given number of weeks. The first 5 experiments show normal controls which make it evident that when no ovarian substance was fed, no change in the oestrus cycle was produced. This held good for *all* the guinea pigs, not only in these 5 experiments but for all the figures given under the heading of "Normal Dioestrus." It will be noted further that a definite in-

hibition followed the feeding of lutein substance but that this effect did not manifest itself very rapidly. The first indications were noted after a feeding period of about 4 weeks and more marked inhibition was observed after administering the *corpus luteum* substance for 6 and 8 weeks. In Experiment 18, an abnormal animal was used, which showed a very frequent oestrus picture so that the dioestral period was of very short duration. In this case, also, feeding of lutein produced a definite inhibition. In Experiments 19 to 23 are shown the results obtained with feeding *corpus luteum* substance for 6 and 8 weeks, respectively, to the same animals.

TABLE I.

Experiment Number	Normal Dioestrus	Feeding	Resultant Dioestrus	Time
	days		days	
1	7	No ovary	8	After 4 weeks
2	9	" "	9	" 4 "
3	8	" "	9	" 4 "
4	10	" "	10	" 4 "
5	12	" "	11	" 4 "
6	8	Lutein	10	" 4 "
7	6	"	11	" 4 "
8	8	"	8	" 4 "
9	10	"	15	" 5 "
10	7	"	10	" 5 "
11	14	"	14	" 5 "
12	11	"	11	" 5 "
13	9	"	12	" 5 "
14	6	"	12	" 6 "
15	8	"	12	" 6 "
16	8	"	12	" 6 "
17	9	"	13	" 6 "
18	2	"	8	" 6 "
19	6	"	15-20	After 6 and 8 weeks
20	9	"	16-35	" 6 " 8 "
21	8	"	16-18	" 6 " 8 "
22	8	"	19-22	" 6 " 8 "
23	8	"	16-19	" 6 " 8 "
24	8	Follicin (C)	3	After 4 weeks
25	9	" (A)	5.5	" 4 "
26	8	" (D)	4.5	" 4 "
27	8	" (B)	2	" 4 "
28	9	" (F)	6	" 4 "
29	12	" (F)	4	" 4 "
30	13	" (E)	14	" 4 "
31	10	" (E)	10	" 4 "
32	8	" (F)	3	" 4 "

In addition to the feeding experiments with *corpus luteum* substance, a number of experiments were made with feeding of the follicular hormone. Some of these preparations were made in this

laboratory. Other preparations of follicular hormone were obtained from the drug market. It was found that administration of the follicular hormone, instead of inhibiting the oestrus, tended to shorten the oestrus cycle.

The results of the research make it quite evident that feeding *corpus luteum* extracts and other ovarian hormones is followed by definite physiological effects, as indicated by a study of the vaginal smears in the guinea pig. When such feeding was discontinued, the animals tended to resume their normal oestrus cycle.

It is interesting to observe that, in a very recent publication, Hisaw noted an experimental relaxation of the pelvic ligaments of the guinea pig by the *corpus luteum*. Such relaxation was produced also by giving large doses of that hormone by mouth.[2]

The findings of the present writers agree also with other experimental work performed by certain investigators on the effect of feeding ovarian substances to animals. Thus, Löwy and Richter (in 1899) found a definite change in the metabolism produced by feeding ovarian substance to castrated female dogs[3] and very recently, Kochmann, employing the vaginal smear method on mice and rats, described definite changes noted after peroral administration of a number of commercial ovarian products.[4] The evidence furnished by the experiments of Hisaw, Löwy, Richter and Kochmann, as well as by the present authors, is in agreement with numerous therapeutic experiences reported by such eminent gynecologists as Burnam,[5] Leighton,[6] and others. We must, therefore, conclude that the hormones of the ovary, like those of the thyroid gland, belong to those endocrines which are capable of exerting their physiological effects not only after injection but also after oral administration.

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[2] Hisaw, *Physiol. Zool.*, 1929, ii, 59.

[3] Löwy and Richter, *Archiv. f. Anat. u. Physiol.*, 1899, Supp. Vol., 194.

[4] Kochmann, *Archiv. f. exp. Path. u. Pharmakol.*, 1929, cxliii, 57.

[5] Burnam, *J. Am. Med. Assn.*, 1912, lxix, 698.

[6] Leighton, *Trans. Am. Assn. Obstetricians and Gynecologists*, 1915, lxxii, 878.