of compounds. This modification also produced variable effects on sodium retention. The 16α-methyl group did not consistently increase liver glycogenic or anti-inflammatory activities. Sodium retention effect of the corticoids was not increased by 16-methylation if parent compound did not possess mineralocorticoid activity. In examples where parent steroid was a sodium retainer, addition of 16α-methyl group caused reduction of this activity.

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Zn^{65} Uptake by Rat Dorsolateral Prostate as Indicator of I.C.S.H. Activity.* (25832)

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Previous investigations have shown that Zn^{65} uptake by dorsolateral prostate (DLP) of the mature rat reflects high natural zinc content of the gland(1). In contrast the ventral lobes of prostate, which are low in natural zinc content(2), do not take up Zn^{65} appreciably(1). It was also demonstrated that amount of Zn^{65} concentrated by DLP depended upon androgen level. Zn^{65} uptake was low in DLP of immature rats and did not reach maximum levels until animals were 14-16 weeks of age (3). This also paralleled other reports on increase in natural zinc content of the rat DLP with age(4). Further experimentation showed that Zn^{65} uptake in DLP of the mature rat was lowered by castration, but could be maintained at control levels by administration of suitable doses of testosterone propionate(3,5). Even more striking fall in Zn^{65} uptake was noted following hypophysectomy, but Zn^{65} uptake levels could be maintained by administration of appropriate doses of either chorionic gonadotrophin or testosterone propionate(5,6). One biological indicator of I.C.S.H. activity frequently used is based on enlargement of the ventral prostate in hypophysectomized rats(7). In view of availability of purified I.C.S.H.† experiments

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† Generous supplies of I.C.S.H. (L.H.) were furnished by Endocrinology Study Section, Nat. Inst. Health.

were set up to determine (a) to what extent this hormone would enhance the capacity of DLP to concentrate Zn^{65} above hypophysectomized levels, and (b) which of the following measurements would be the most sensitive indicator of I.C.S.H. activity in hypophysectomized rats, *i.e.*, ventral prostate weight, DLP weight, Zn^{65} uptake/mg DLP, or total Zn^{65} uptake by DLP.

Methods. Hypophysectomized male Wistar rats (16 weeks of age, weighing 300 to 350 g) were purchased from Charles River Breeding Labs, Brookline, Mass. On 5th day post-surgery I.C.S.H. was administered to 20 hypophysectomized rats at 0.2 mg/rat. Injections were made intramuscularly in 0.2 ml physiological saline. Daily injections were continued for 6 days. Ten hypophysectomized rats administered 0.2 ml physiological saline daily served as controls. On 6th day of injections, Zn^{65} was administered intracardially at 0.04 μc/g as outlined previously(8). Twenty-four hours later the animals were sacrificed and ventral prostates removed. At the same time DLPs were dissected by technics described previously(9). After drying overnight at 110°C ventral prostates and DLPs were weighed. Zn^{65} uptake in DLP was determined in well-type scintillation counter as outlined earlier(8). The following measurements were made: (a) ventral prostate weight, expressed as mg dry weight; (b) DLP weight, expressed as mg dry weight; (c) Zn^{65} uptake/mg DLP, expressed as counts/minute/mg tissue; and (d) total Zn^{65} uptake in DLP, expressed as total counts/minute. All rats used were inspected grossly for completeness of hypophysectomy. None showed any pituitary remnants. The animals were housed under constant conditions of temperature, humidity and lighting (12-hour light, 12-hour darkness cycle). Experiments were conducted during March and April, 1960(5,8).

Results. Fig. 1 shows that daily administration of 0.2 mg of I.C.S.H. (a) increases the weight of ventral prostate 2.3-fold over the hypophysectomized control ($P<0.001$), (b) increases the weight of DLP 2.7-fold over the hypophysectomized control ($P<0.0001$),

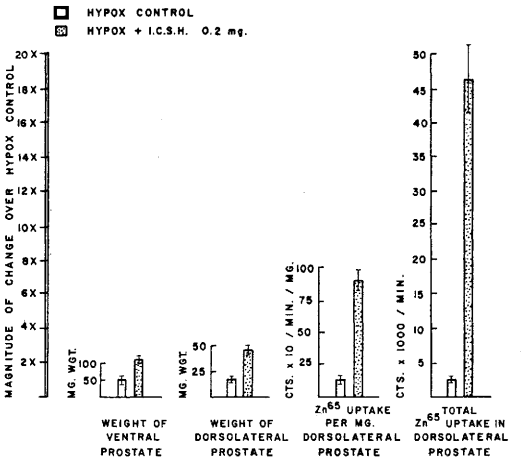

FIG. 1. Effect of daily administration of 0.2 mg of I.C.S.H. to hypophysectomized rats on (a) ventral prostate wt, (b) DLP wt, (c) Zn^{65} uptake/mg DLP, and (d) total Zn^{65} uptake in DLP. S.E. of mean are shown.

(c) increases Zn^{65} uptake/mg DLP 6.7-fold over the hypophysectomized control ($P<0.0001$), and (d) increases total Zn^{65} uptake by DLP 18.4-fold over the hypophysectomized control ($P<0.0001$).

Summary. Our purpose was to determine which of the following measurements would be the most sensitive indicator of I.C.S.H. activity in hypophysectomized rats, *i.e.*, weight studies of ventral prostate and of DLP, or functional studies of capacity of DLP to concentrate administered Zn^{65}. 0.2 mg of I.C.S.H. daily increased ventral prostate weight and DLP weight 2.3-fold and 2.7-fold, respectively, over hypophysectomized control values. Measurement of functional capacity of DLP to concentrate Zn^{65} was a much more sensitive indicator of I.C.S.H. activity as indicated by the following: 0.2 mg I.C.S.H. increased Zn^{65} uptake/mg DLP 6.7-fold over hypophysectomized control value, and increased total Zn^{65} taken up by the DLP 18.4-fold over hypophysectomized control value.

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In vitro and *in vivo* Radioautography in Recognition and Localization of Gastric Cancer.* (25833)

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Malignant neoplasms have been shown to take up a greater amount of radioactive phosphorus than does normal tissue(1,2). Initial studies with *in vitro* radioautography provided the basis for extending the use of this property of radioactive phosphorus to clinical detection of occult gastric malignancy by a method of *in vivo* radioautography. *In vitro* radioautographs were obtained of 25 resected gastrointestinal specimens following intravenous administration of 500 μc P32, 12 to 24 hours prior to surgery in patients with suspected carcinoma of the gastrointestinal tract. The excised organ, directly following removal, was opened in its long axis and the mucosal surface was washed with saline solution. In a dark room, the excised tissue was then placed on an 8 by 10″ x-ray film with the mucosal surface down and separated from the film by a piece of Saranwrap to prevent moisture from the specimen affecting the photographic emulsion. Care was necessary to smooth out all mucosal folds so that only a single thickness of the mucosa was exposed to the x-ray film. The film and specimen were then placed in a black lined box and retained in the refrigerator for 12 to 16 hours, following which the x-ray film was developed. Malignant neoplasms consistently produced a black area signifying increased radioactivity (Fig. 2). Confirmation of the black areas as owing to the malignant lesion was obtained by super-imposing each specimen on the developed film. Benign ulcers demonstrated a lighter area than normal mucosa, thus suggesting a lower P32 uptake of that lesion than in adjacent healthy tissue (Fig. 1). Correct positives were noted in all 18 gastric, colonic, or rectal cancers and correct negatives in the remaining 7 cases. There were no false positive or false negative results except for area of early polypoid hyperplasia adjacent to gastric carcinoma which presented a false positive (see arrow, Fig. 2).

Methods and materials of in vivo *radioautography.* Patients with suspected gastric malignancy or with precursor conditions, such as pernicious anemia or achlorhydria, were given 500 μc of radioactive phosphorus in the form of sodium phosphate orally, 12 hours prior to study. A thin latex balloon (condom) coated on the inside surface with a highly sensitive photographic emulsion† on an elastic latex-base and attached to a No. 14 French nasogastric tube was then passed into the stomachs of these patients, inflated with air to about 600 ml, left in place for 6 hours, then removed and developed. A blackened area on the balloon denoted proximity of the photo-sensitive coated balloon to an area which had an increased uptake of radioactive phosphorus, indicating probable presence of a malignant tumor (Fig. 3).

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† Eastman Kodak Co., Rochester, N. Y.