displacement to be recorded.

Schematic representation of a complete 4-channel recording system is shown in Fig. 2A. It utilizes 8 autosyns, 4 of which drive the recording pens, the remaining 4 of which serve as motion take-off devices. The recording autosyns are mounted beneath the top of the paper puller with their shafts extending vertically upward through holes in the top plate to connect with the pens.

A typical record showing carotid blood pressure, respiration, knee jerk, and cortically evoked forelimb movement is shown in Fig. 2B. The blood pressure record was obtained by coupling a take-off autosyn to a float riding the column of mercury in the manometer. From such a record, pulse rate and respiratory variations of blood pressure and pulse are also obtainable. Respiration was obtained by strapping a cork on the animal's chest or abdomen and placing the autosyn shaft in a slot in the cork. Knee jerk and forelimb movement were obtained by slipping the shaft of the pickup unit beneath several turns of rubber band wrapped around the extremity.

In our experience it has been possible to prepare a typical mammalian experiment more satisfactorily with the autosyn recorder than with the standard ink-writing kymograph and routine physiological recording levers, tambours, etc. We attribute this to several factors: (1) The apparatus obviates complicated mechanical, pneumatic, and hydraulic couplings between the source of the displacement and the recording system. (2) The recording system can be physically separated from the source of the movement, thus avoiding crowding around the animal table. (3) The motion pickup autosyns are easily adjusted to fit the direction of the movement. (4) The sensitivity of the autosyns makes small displacements recordable. (5) The fixed mounting of the recording pens avoids the necessity of lining up pens, or obtaining simultaneous ordinates, and facilitates the reading of the records. (6) The autosyns are simple to operate and require practically no maintenance.

Summary. An apparatus has been described which employs autosyns for the recording of displacements produced by physiological activity. The apparatus appears to have certain advantages over the kymographs customarily used for such recordings.

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Effect of Adrenocorticotropin on Thyroidal Collection of I_{131} in the Adrenalectomized and Intact Rat.* (18625)

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This report is concerned with the effect of the administration of adrenocorticotropin on the collection of I_{131} by the thyroid gland of both adrenalectomized and intact rats.

Methods. Male rats of the Wistar strain (Carworth Farms) were placed on a low-iodine minimally goitrogenic (Steenbock) diet for a period of 2 weeks(2). They were then weighed and divided into 4 groups: Group 1, control intact; Group 2, adrenocorticotropin treated intact; Group 3, control adrenalectomized; and Group 4, adrenocorticotropin treated adrenalectomized. Bilateral adrenalectomy was carried out in the usual fashion employing a dorsal approach. In addition to

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TABLE I.

Group	No. of animals	Initial body wt (g)	Final body wt (g)	Thyroid wt (mg)	Thyroidal uptake of I_{131}, %
1. Control-Intact	20	130.1 ± 2.4	146.2 ± 2.7	12.5 ± 0.4	33.2 ± 2.1
2. Intact-ACTH	19	126.9 ± 3.1	134.9 ± 4.5	12.0 ± 0.4	20.9 ± 1.8
3. Control-Adrenalectomy	11	128.4 ± 3.0	126.5 ± 3.8	10.7 ± 1.1	31.2 ± 2.3
4. Adrenalectomy-ACTH	7	129.7 ± 3.1	138.3 ± 4.7	11.3 ± 0.7	18.0 ± 0.9

$$S.E. = \sqrt{\frac{\Sigma d^2}{(n)\,(n-1)}}.$$

3 cc of 5% glucose in normal saline administered subcutaneously at the time of operation, the adrenalectomized animals were given 0.5 mg of desoxycorticosterone acetate daily by intramuscular injection. Beginning on the fifth post-operative day, 5 mg of adrenocorticotropin was administered subcutaneously daily in three divided doses for a period of 4 days to Groups 2 and 4. On the fourth day of adrenocorticotropin therapy all 4 groups of animals were given approximately 1 microcurie of I_{131} intraperitoneally. Twenty-four hours later the animals were killed rapidly en masse with ether anesthesia. The thyroid glands were dissected away carefully, weighed on a torsion balance, digested in sodium hydroxide, and analyzed for I_{131} as described previously(2).

Results. The collection of I_{131} by the thyroid gland was reduced following the administration of adrenocorticotropin in both the adrenalectomized and the intact rats. The thyroidal uptake of the radioactive isotope was the same in the control intact and adrenalectomized groups. Similarly, no difference in uptake was noted between the adrenocorticotropin treated intact and adrenalectomized animals.

Discussion. We have previously reported that the thyroidal collection of I_{131} is reduced following the injection of epinephrine and of cortisone(1,2). These studies have since been confirmed by other observers who demonstrated a decrease in the uptake of I_{131} by the thyroid following other forms of stress and following the injection of adrenocorticotropin as well as of cortisone to the intact animal (3-5). More recently we have demonstrated (6) that the thyroid hyperplasia induced by the feeding of propylthiouracil can be inhibited by the administration of adrenocorticotropin. Under the conditions of this latter experiment, cortisone, however, induced no demonstrable change.

The experimental studies now reported demonstrate that adrenocorticotropin reduces the collection of I_{131} by the thyroid gland even in the absence of the adrenal cortex. This would suggest that this is mediated by means of a direct inhibitory effect of adrenocorticotropin on the adenohypophyseal secretion of thyrotropin. It is unlikely that the action of adrenocorticotropin is on the thyroid gland, since recently reported experiments indicate that adrenocorticotropin does not prevent the action of thyrotropin on the thyroid gland(7).

These observations may explain the seemingly paradoxical results reported in patients with Addison's disease treated with cortisone (7). In these subjects there is frequently observed a temporary increase in the thyroidal I_{131} accumulation gradient followed by a decrease to values below that noted in the untreated state. It is possible that the ad-

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ministration of cortisone may first result in a decrease of adrenocorticotropin secretion and a consequent removal of the inhibiting effect of this hypophyseal fraction on thyrotropin secretion. Subsequently the direct inhibiting effect of cortisone on thyrotropin secretion comes into play.

The results of the studies reported from this laboratory would suggest that the phenomenon of stress is characterized by a discharge of adrenocorticotropin and thyrotropin from the adenohypophysis, and that the subsequent secretion of thyrotropin is inhibited both by adrenocorticotropin and by certain fractions of the adrenal cortex.

Summary. The administration of adrenocorticotropin results in a decreased collection of I_{131} by the thyroid gland of both the intact and adrenalectomized rat, suggesting that adrenocorticotropin inhibits the adenohypophyseal secretion of thyrotropin.

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Pathological Changes in Rabbits from Repeated Intravenous Injections of Periston (Polyvinyl Pyrrolidone) or Dextran. (18626)

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The paucity of information in the American literature on the histopathological changes resulting from intravenous injections of periston (polyvinyl pyrrolidone), a blood plasma substitute, prompts the presentation of this report. In addition to clinical experience with periston, the histological changes in animals and in a few infants have been reported(1). Dextran, another plasma substitute, has been stated to cause no morphological changes in animals injected repeatedly(2).

We have administered to rabbits, over a 2 month period, 16 intravenous injections of 10 cc/kg of 6% dextran* in distilled water, or 3½% peristont in distilled water, or 10% dextrose in physiological saline solution (Table I). The ear veins were used, and each injection took about 10 minutes. No systemic effects, even of a minor nature, were observed during the experimental period. One male rabbit on dextrose died from dysentery 2 weeks after the start of the experiment; this death could not be attributed to dextrose. No blood counts or blood chemical studies were done on these animals.

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* Pharmacia "Macrodex", lot 153.

† General Aniline and Film Corp., lot 1687-202.

Gross pathology. In the animals given dextran there were no gross abnormalities that could be attributed to that agent. In the group given periston, the spleen showed definite slight enlargement (Table I). Except for the increase in size, there was no difference in the appearance of the spleen. The periston animals had an average of 0.70 g of spleen per kg animal, while the values for dextran and dextrose were 0.40 and 0.41 respectively. In the dextrose group, there was possibly slight renal enlargement (Table I). With respect to "spontaneous" lesions and parasitism, the rabbits on the whole were very free from these conditions.

Microscopic pathology. The one outstanding lesion of the entire experiment was a foam cell storage phenomenon in the periston animals; this was seen best in the spleen, and in lesser degree but sometimes prominently in several other structures. In the *spleen* the foam cells made up an estimated ⅓ to ½ of the volume of the organ. The foam cells had reticular type nuclei, basophilic and markedly vacuolated cytoplasm, and were from 15 to 100 (usually 20-25) μ in diameter, the larger ones generally being multinucleated. The foam cells and especially their vacuoles contained periston or some near derivative, the