which have been used both in classical physics and in modern theory. If, as it is assumed at present, nuclear forces are due to emission and absorption of mesons by nuclear particles then it is probable that within the nucleus the classical concept of a field of forces must be abandoned. But it was brought out at the conference that even one of the oldest field theories—the theory of electromagnetic fields—is open to serious revision when investigated in small regions of space, particularly when applied in the immediate neighborhood of elementary particles. One of the most radical suggestions that was put forward would abandon completely the concept of a field and would reintroduce instead the idea of interaction of particles at a distance.

The question of artificial-meson production was discussed and here there seems to be some hope of practical results as soon as it becomes possible to bombard nuclei with protons of about 100 million volts. It was found that even at such high bombardment-energies the influence of binding-energies within the nucleus remains important. Artificial production of mesons would probably help very greatly in understanding the nature of elementary particles and of nuclear forces.

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SPECIAL ARTICLES

ON THE HORMONAL ACTIVITY OF A STEROID COMPOUND

EXPERIMENTS on immature adrenalectomized rats have shown that Δ^5-3-hydroxy-21-acetoxy-pregnene-20-one or acetoxy-pregnenolone (A.O.P.), an intermediary product in the Steiger and Reichstein[1] synthesis of desoxycorticosterone acetate (D.C.A.), possesses pronounced corticoid[2] activity. This finding was deemed worth recording, since up to the present no artificial steroid has been shown to possess corticoid potency and A.O.P.—though simpler to manufacture than D.C.A.—has not been assayed for any possible biological activity.

TABLE I

ACTION OF A.O.P. ON ADRENALECTOMIZED RAT*

Treatment	Hemoglobin in g/100 ml of blood	Glucose in mg/100 ml of blood	NaCl in mg/100 ml of blood	N.P.N. in mg/100 ml of blood	Deaths
Oil	14.1	68	410	142	4
A.O.P.	9.0	108	471	82	0
	P=0.02	P=0.02	P=<0.01	P=<0.01	

* All figures in the table represent averages of each group. The significance of the apparent differences between treated and untreated animals was evaluated by "Student's" method for small samples and is expressed in terms of probability estimated by graphic interpolation in Fisher's table of t.[3] It is generally agreed that differences may be regarded as significant if P is smaller than 0.05.

In our first experiment 5 male and 5 female immature albino rats (weighing 35 to 46 g) were treated once daily subcutaneously with 2 mg of A.O.P. in 0.1 ml of peanut oil on 4 consecutive days, their adrenals having been removed on the first day of treatment. They were killed 6 hours after the last injection simultaneously with 5 male and 5 female adrenalectomized controls (weighing 34 to 47 g) treated with 0.1 ml of peanut oil only. The results summarized in Table I clearly indicate that this treatment was beneficial as judged by its ability to maintain life, to prevent the hemoconcentration (detectable by the rise in blood hemoglobin determined with Evelyn's photoelectric colorimeter), the decrease in blood chlorides (expressed as NaCl determined by Van Slyke's method), the hypoglycemia (Schaffer-Hartmann-Somogyi method), and the rise in blood N.P.N. (Folin and Wu method modified for microdetermination with the Evelyn photoelectric colorimeter).

In order to gain quantitative data concerning the corticoid potency of A.O.P. the compound has been assayed in doses ranging down to 120 gamma per day given in two subcutaneous injections to adrenalectomized rats weighing 38 g on the average. It was found to be only slightly less active than D.C.A. as judged by the ability of this dose of the two compounds to maintain life and permit growth in the absence of the suprarenals. The only apparent qualitative difference between the action of the two steroids appears to be that, unlike D.C.A., A.O.P. caused no adrenal cortical atrophy in intact female rats weighing 100 g and receiving 15 mg of the compound subcutaneously on 20 subsequent days.

Similar experiments revealed that 1^5-3-hydroxy-pregnene-20-one likewise possesses corticoid activity.

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[1] M. Steiger and T. Reichstein, *Helvet. chim. Acta*, 20: 1164, 1937.

[2] The term "corticoid" is used here instead of the cumbersome designation "adrenal cortical hormone-like" in accordance with the recently proposed terminology of the steroid hormone actions (H. Selye, *Nature*, in press).

[3] R. A. Fisher, "Statistical Methods for Research Workers," 6th Edition, Edinburgh, 1936, p. 128.