pteridine (6-formylpteridine), although non-carcinostatic by itself, augmented the carcinostatic action of 8-azaguanine against a mammary adenocarcinoma. This effect was found to be dependent upon a time interval between the injection of 6-formylpteridine and 8-azaguanine. 2. 6-Formylpteridine inhibited the *in vitro* deamination of 8-azaguanine by tumor extracts. Pre-incubation of enzyme with inhibitor was found to be essential for maximal inhibition. 3. It was postulated that the enhanced carcinostatic effect observed *in vivo* could be due to inhibition of 8-azaguanine deamination by 6-formylpteridine, since the deaminated product (8-azaxanthine) is non-carcinostatic.

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## Influence of Cortisone on Nucleic Acids and Protein Content of the Chick Embryo. (19963)

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It has been demonstrated by Karnofsky *et al.*(1) that cortisone inhibits both the somatic development and the growth of the chick embryo. In view of the relationship existing between nucleic acid metabolism, protein synthesis and growth, it seemed interesting to study whether this inhibitory effect of cortisone on growth is associated with some change in the ribonucleic (RNA), desoxyribonucleic (DNA) acids and in the protein nitrogen (N) content of the chick embryo.

*Methods.* Fertile White Leghorn eggs purchased on the market were incubated at 38°C and 75% relative humidity. At 8 days of development, the chorioallantoic membrane was injected with 1.25 mg of cortisone acetate (Merck) per egg; controls were similarly treated with the saline suspension alone. The surviving embryos were sacrificed starting from the 11th to the 18th day of incubation, *i.e.,* from 3 to 10 days after the treatment, 4 embryos per group per day. They were weighed after freezing, then transferred to a Waring Blendor. The homogenate was analyzed for protein N content (precipitation with 14% trichloracetic acid and micro-Kjeldahl determination) and for DNA and RNA content by the method of Schmidt-Thannhauser(2).

*Results.* In the cortisone-treated embryos, growth and somatic differentiation were clearly inhibited starting from the third day after hormone injection; the effect being more evident in the following days. Fig. 1 presents the mean body weight and the analytical data in control and cortisone treated embryos; the protein N and the DNA and RNA values are plotted as mg of N and as $\mu$g of P, respectively. It appears that corti-

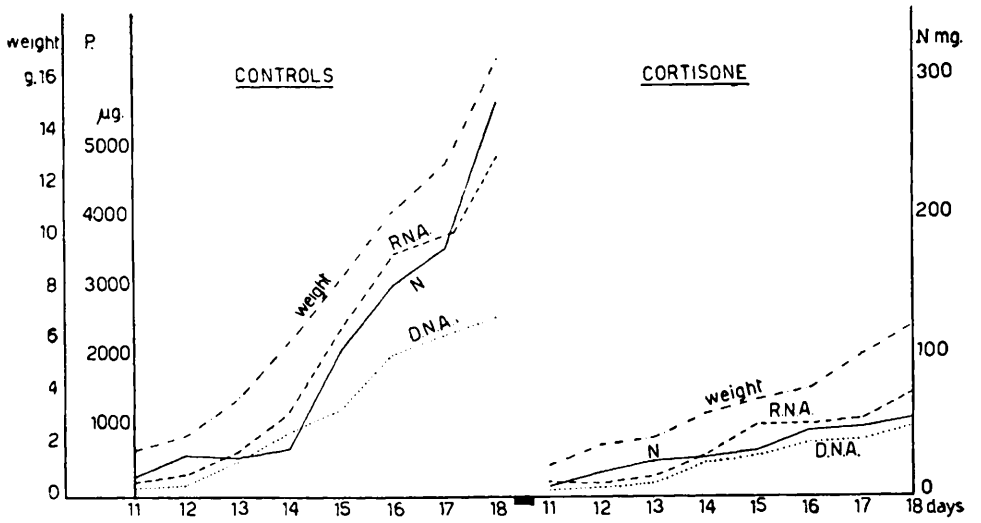


FIG. 1. Effect of cortisone treatment on wt and some biochemical constituents of the whole chick embryo.

sone definitely inhibited the growth and lowered the protein and nucleic acid content of the whole chick embryo. In order to investigate further the phenomenon, the mean analytical values of the embryos over the entire period of study have been calculated and referred to 100 g of wet weight (Table I). Cortisone treatment produced a significant percentage decrease in protein and RNA, while the DNA percentage was practically unchanged.

*Discussion.* The inhibition by cortisone of the growth of the chick embryo parallels the similar effect of the hormone on the growing and adult rat, first demonstrated by Wells and Kendall(3) and recently emphasized by Cavallero *et al.*(4). Moreover, from the present data it appears that inhibition of growth is associated with a definite decrease of protein and RNA content of the body, but not of the DNA. Since this decrease is evident when the values are referred to unit weight, it appears to be independent of the inhibition of weight.

Baker and Ingle(5) and Lowe *et al.*(6) have shown that under the influence of ACTH or cortisone, the ribonucleic acid and protein nitrogen concentrations of liver cells are diminished, and Kass and Kendrick(7) have made similar observations on the lymph nodes of rats treated with cortisone. From the above, it seems likely that cortisone influences the RNA metabolism and the protein synthesis of the cells; therefore the inhibition of the growing organism by cortisone appears to be related to some disturbance of protein synthesis and is closely correlated with a decrease of the RNA content of the organism.

TABLE I. Mean Values per 100 g Wet Body Weight of Controls and Cortisone-Treated Chick Embryos.

| | Controls | | | Cortisone | | |
|---|---|---|---|---|---|---|
| | N, g | DNA, mg P | RNA, mg P | N, g | DNA, mg P | RNA, mg P |
| Mean | 1.19 | 13.9 | 23.4 | .95 | 12.9 | 18.51 |
| ± S.E.* | .08 | .83 | .96 | .07 | .91 | 1.33 |
| P† | | | | <.05 | × | <.01 |

* Stand. error $= \sqrt{\frac{\Sigma \cdot d^2}{n(n-1)}}$.

† Calculated according to the test of Student.

*Summary.* Cortisone inhibited the growth and concurrently reduced the protein, the DNA and the RNA content of the whole chick embryo; when referred to the unit weight, only the protein and the RNA showed significant decreases. It is suggested that the growth inhibiting effect of the hormone is closely connected with a decrease of protein

and RNA synthesis.

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## Poliomyelitis and Coxsackie Viruses Isolated from Normal Infants in Egypt.* (19964)

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In Egypt, poliomyelitis is most unusual in native adults and has been rarely reported at any age. Yet, as Paul(1,2) has pointed out, the endemic paralytic attack rate for this disease in Egyptian infants is appreciable. Furthermore, a serological survey carried out on "normal" sera collected in Egypt in 1950, revealed that neutralizing antibodies to all three types of poliomyelitis virus are also acquired at an early age among native Egyptians. For type 2, more than 50% of infants have antibodies before they are 2 years of age, and for all 3 types 75 per cent or more before they are 4 years old. Complement fixing antibodies, which are transient in poliomyelitis, were also measured in this population(3), and the results supported the view that in Egypt infection with poliomyelitis virus must be widespread in the early years of life.

To extend these studies, 36 rectal swabs were collected in Egypt‡ from normal babies between 6 and 12 months of age, *i.e.,* at a time in life when the studies referred to above indicated maximum prevalence of infection. The purpose here was to determine how frequently one might detect poliomyelitis virus (and other viruses) in the intestinal tract of normal infants. The samples were collected by Dr. Robert Ward, while in Egypt carrying out a study of the occurrence of poliomyelitis virus in flies(4), and were generously supplied to us. The swabs were tested not only for poliomyelitis virus, but for Coxsackie (C) viruses as well, and both viruses were found.

*Collection of specimens.* Specimens were collected only from well children between 6 and 12 months of age, who were inhabitants of villages in the neighborhood of Cairo, representing an area under study by the International Health Division of the Rockefeller Foundation. It was in this same district that specimens for the serological studies mentioned above(2,3) had been collected. The swabs were placed in 1 ml of sterile water and frozen on dry ice. They were transported in the frozen state to New Haven where the laboratory studies were carried out. Sera from the children were also obtained, frozen soon after collection, and also transported on dry ice.

*Methods.* After thawing, the fluid contained in each swab was expressed by placing the swab in the barrel of a 1 ml syringe and forcefully squeezing it with the piston. The expressed fluid was added to the fluid in which the swab had been soaked, a total of about

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