DNA synthesis after treatment with cortisol is not the result of a direct interference with a biosynthetic pathway, but is simply a result of the reduction in the number of cells able to incorporate thymidine. Other effects of cortisol on lymphatic tissue, such as decreased glucose utilization and decreased protein synthesis, also may be the result of this phenomenon.

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BIOLOGY

Nucleoside Synthesis under Potentially Prebiotic Conditions

IT is widely believed that the "prebiotic" formation of polynucleotides was a key step in the evolution of life. One of the least understood steps in this synthesis is the formation of nucleosides. Sugars, purines and pyrimidines can be made in relatively high yields from simple materials, and nucleosides can be converted to nucleotides under reasonably plausible "prebiotic" conditions[1], but the yield of nucleosides reported in most prebiotic syntheses is poor. We have therefore investigated certain aspects of prebiotic nucleoside synthesis.

We found that well defined adducts of deoxyribose or ribose with adenine, cytosine or guanine are formed when the dry bases and sugar are heated together at temperatures in the range 130°–170° C for a few minutes. Three compounds were obtained from adenine and deoxyribose, one of which, obtained in good yield, had an ultraviolet spectrum almost identical with that of deoxyadenosine and behaved identically on chromatography in aqueous ammonia (*p*H 10) and other solvent systems. It is not deoxyadenosine, however, because it hydrolyses much too rapidly in alkaline solution. Whereas deoxyadenosine withstands heating to 100° C at *p*H 13 for an hour with very little hydrolysis, the thermal adducts are all hydrolysed almost completely within 15 min. Carbon[2] has reported two diastereoisomeric compounds formed from deoxyribose and adenine in hot aqueous solution and tentatively identified them as 2,3-dideoxy-(9-purinyl)-pentoses. Two of our products are very similar to these in spectra and stability and may be the same.

In view of these findings, our two laboratories have separately investigated the photochemical reaction between adenine and deoxyribose in the presence of cyanide. We confirm the original finding that material with the same R_F as deoxyadenosine is formed[3]. This important product is not deoxyadenosine, however, because it is much less stable to 0·1 molar alkali than is the natural nucleoside.

Thus adenosine cannot be present among the photoproducts in greater than 0·4 per cent yield and further investigation will show whether the indications that deoxyadenosine is indeed formed in small amounts are correct.

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Gastrulation in *Papilio polytes* L.

GASTRULATION has often been observed and described in the Lepidoptera, but it remains a controversial topic. Differences of opinion concern chiefly two points: (*a*) how does gastrulation take place; and (*b*) does the process take place in the same way along the whole embryo or differently in different parts of the embryo ?

Schwartze[1] stated that gastrulation in Lepidoptera proceeds forwards from the back. This is to a large extent the opposite to what I have observed in our studies of *Papilio polytes* (Papilionidae, Lepidoptera) and is the exact opposite of the observations of Eastham[2] and Drummond[3]. Furthermore, Schwartze maintained that in Lepidoptera gastrulation is brought about by: (*a*) invagination to form a tube; (*b*) cell proliferation; and (*c*) overgrowth; and that these different processes can occur in different regions of the same embryo. Toyoma[4] and Schwangart[5] confirmed this suggestion.

According to Eastham[2] gastrulation takes place in the same way throughout the length of the embryo, and the germ band undergoes the following sequence of changes. (*a*) Proliferation of cells along the middle line followed by differentiation of this region as the middle plate; (*b*) an invagination of the middle plate; and (*c*) overgrowth of the middle plate by the lateral plates.

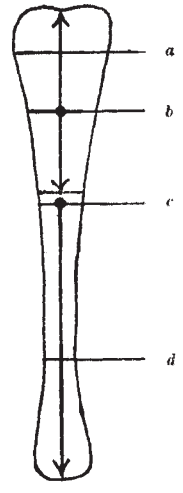

Fig. 1. Diagrammatic representation of the scheme of gastrulation. The process commences independently at level *b* anteriorly and at level *c* posteriorly and then continues in the directions indicated by arrows.