it may be for this reason that few changes can be tolerated in the sequences of histones.

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Histone Changes and Cell Division

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Four changes have so far been found to affect the microstructure of histones: acetylation, methylation, phosphorylation and oxidoreduction. In synchronized or partially synchronized cell systems, the first of these increases with the onset of new RNA synthesis (Pogo, Pogo, Allfrey & Mirsky, 1968), whereas the peak of methylation occurs just before mitosis, when DNA synthesis has declined (Tidwell, Allfrey & Mirsky, 1968).

Phosphorylation and oxidoreduction changes will be considered here. Phosphorylation may occur on all the histones so far described (Langan, 1969), but the increased phosphate content of histone F1 during DNA synthesis is the most firmly established. This increase has been found in regenerating liver, kidney (Ord & Stocken, 1968; Stevely & Stocken, 1968) and pancreas (P. J. Fitzgerald, M. G. Ord & L. A. Stocken, unpublished work), and conversely a decline in phosphate content occurs after birth in rat liver (Ord & Stocken, 1969) and during maturation of fish sperm (Ingles & Dixon, 1967).

Variations in phosphate content have been found for other histones remaining after the selective removal of histone F1. In regenerating rat liver an increase occurs during the first 2 hr. after partial hepatectomy, when new messenger RNA is being formed. The amount is even further increased during the period of DNA synthesis (Ord & Stocken, 1969). This process entails enzyme(s) different from that required for the phosphorylation of histone F1.

Oxidoreduction changes in the thiol groups of histones have been studied in fertilized sea-urchin eggs and in phytohaemagglutinin-stimulated lymphocyte cultures (M. E. Cross & M. G. Ord, unpublished work). Correlations between an increasing proportion of thiol to disulphide and increasing information transfer from DNA will be examined and also the importance of thiol histones in structural changes in cell nuclei. Possible enzyme changes leading to the alterations in histone micro-groups will be considered and the suggestion that alterations in micro-structure are required as permissive states for information transfer discussed.

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Formation and Processing of Ribonucleic Acid in Subnuclear Components of *Chironomus tentans*

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Recent progress in the field of intranuclear RNA metabolism (for a review see Darnell, 1968) has to a large extent been due to the successful development of methodology for isolation of nuclei and certain gross nuclear fractions like nucleoli and nucleoplasm. It would be highly desirable, however, to achieve more extensive separations. Nucleoli are often of different genetic origin and may in certain cases also fulfill different functions: nucleoplasm contains not only chromatin, functionally highly heterogeneous, but also nuclear sap, differing from the chromosomes in metabolic properties.

It may be easiest to obtain various subnuclear components if they can be identified under the microscope and individually isolated under control