It persists metastably at ambient pressure, however, when heated in air at 600° C for 65 h.

Recent studies of polymorphic pairs of oxides related by re-constructive transformations of first co-ordination have shown that the effect of an increase in cation co-ordination from 4 to 6 is to decrease the molar refraction by ~12 per cent and to shift the main infra-red absorption band ~23 per cent in the direction of increasing wave-length[7-9]. Applying these principles to the polymorphs of ZrP_2O_7, it is deduced from the small difference in molar refraction and the slight displacement toward longer wave-lengths of the main infra-red absorption bands at 8·8, 10·2 and 13·4μ (cf. Table 3 and Fig. 1) that there is no difference in the primary cation co-ordination of these polymorphs and that the increase in density is due to closer packing of the co-ordination polyhedra. The two structures probably differ in secondary co-ordination and may thus be related by a reconstructive transformation of higher co-ordination[10].

There is some indication that the refractive index of the cubic form increases with pressure; reagent preheated to 400° C has $n = 1{\cdot}661 \pm 0{\cdot}002$ (Na light) whereas the cubic form pressurized at 35k bars and 750° C has $n = 1{\cdot}666 \pm 0{\cdot}002$ (Na light). The infra-red spectrum of the cubic form is in agreement with that given by Steger and Leukroth[11].

It will be interesting to subject the other known members of this isostructural group to high pressures and temperatures to determine whether a group of pressure-dependent polymorphs isostructural with the high-pressure polymorph of ZrP_2O_7 can be synthesized.

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BIOCHEMISTRY

Nucleoprotein Synthesis in the New-born Mouse

The proceedings of the first World Conference on Histone Biology and Chemistry were summarized in a recent article by Bonner and Ts'o[1]. Part of the reported discussion dealt with the probable relationship between DNA replication and histone synthesis. It was pointed out that 5-fluorodeoxyuridine blocks DNA synthesis but allows the synthesis of histone to proceed in an essentially normal manner. This evidence was cited to support the view that DNA replication and histone synthesis are not necessarily coupled although they usually accompany one another. Similar conclusions have been reached by Plaut[2], who investigated the pattern of nucleoprotein synthesis in *Drosophila* polytene chromosomes by means of the pulse-labelling technique. He found that the labelling patterns resulting from brief exposures to tritiated precursors of DNA (H^3 thymidine) and protein (H^3 lysine, H^3 histidine) were distinctly different. In summary, DNA labelling was often restricted to certain sites along the chromosome, while protein labelling was found to be more or less continuous. The present report, based on the results of cytophotometric investigations, furnishes further evidence in support of the view that DNA replication and histone synthesis may not be coupled.

Table 1

	DNA–Feulgen	Histone–fast green
New-born liver	3·54 ± 0·19 (49)	1·96 ± 0·07 (52) 4·64 ± 0·17 (13)
New-born kidney	3·30 ± 0·04 (49)	1·93 ± 0·07 (34) 3·50 (6)

In the mouse, the onset of parturition appears to be accompanied by a virtual cessation of mitosis in fœtal tissues; significant restoration of mitotic activity does not occur until after suckling has begun[3]. Cytophotometric determinations of nuclear contents of DNA and histone were carried out as part of an attempt to elucidate the probable nature of this 'mitotic arrest'. Male animals were killed a few hours after birth and pieces of kidney and liver were fixed in 10 per cent neutral formalin. Following fixation and washing, the tissue samples were dehydrated, embedded, sectioned, and mounted together on the same slides (sections of liver from an adult male were used for comparative purposes). Slides were stained either by the Feulgen reaction for DNA[4], or by the alkaline fast green procedure for histone[5]. The cytophotometric procedures have been described previously[6,7]. The results are summarized in Table 1. The mean DNA–Feulgen and histone–fast green contents are given in arbitrary units (sample size is indicated in parentheses). The Feulgen data suggest the existence of only one nuclear class. The mean value is characteristic of normal diploid cells in the G_1 period of interphase. The fast green measurements, on the other hand, are indicative of a mixed population with some nuclei apparently containing the post-synthetic level of histone expected of cells in the G_2 period. From these results it may be concluded that synthesis of histone can precede DNA replication.

The results derived from three rather different analytical approaches are therefore in agreement and strongly suggest that DNA replication and histone synthesis are not invariably coupled.

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Possible Cause of Electrophoretic and Chromatographic Heterogeneity of Pituitary Hormones

There is evidence that pituitary hormones can exist in more than one biologically active form. Electrophoresis[1] or chromatography[2] of thyrotrophic hormone has been found to yield a number of active fractions. Several components with corticotrophic potency were obtained from adrenocorticotrophic hormone (ACTH) from various sources[3-5], while fractionation of ovine prolactin also revealed various active forms of the hormone[6,7]. Similar results have been obtained with preparations of sheep[8,9] and human[10] interstitial cell-stimulating hormone (ICSH), as well as with alkali-treated