Specific Optical Rotation of Nucleic Acid

One well-known type of optical rotation (e.g., quartz) arises from a helical arrangement of atoms in the crystal. I suppose it is technically too difficult to observe this in nucleic acid fibres, although it should be quite feasible in sheets. In fact it has already been observed in gelatin films by Robinson and Bott (Nature, 168, 325, 1951). An interesting point is that specific rotation in many substances is very high near an absorption band. Thus the optical rotation of a film of nucleic acid could be observed photographically (this is a standard technique) near λ2500 where the nucleotides absorb and the effect of moisture content and stress could also be studied. (The law is very similar to that of the Sellmeier dispersion formula).

The method has possibilities in solution as a means of correlation with light-scattering work. I doubt if it is theoretically possible to correlate the rotation with helical structure only since it can arise from asymmetric carbon atoms, but it might be a very useful method in showing changes of configuration arising from changes of pH etc.

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J.T. Randall