removal of the amino acid, suggest that degradation takes place. If arginine merely prevents translation, normal functioning of the messenger would probably resume when it is removed. But if it is causing degradation, the effect could not be reversed by removing the arginine. There was progressively less translation after increasing periods of incubation with arginine, which implies that the arginine probably helps degradation of the messengers in some way.

Can this effect account for the control of the arginine system, or is it merely an adjunct to a transcriptional control mechanism? The latter type of situation seems to apply in the *E. coli* tryptophan system, which is controlled at transcription by interaction of its repressor protein with DNA, but in which the translation of messenger may also be affected by the presence of tryptophan. The usual objection to translational control as a major mechanism is that it would be wasteful because the cell must then expend energy in synthesizing RNA which it is not going to use.

There is no evidence to show whether transcriptional control applies in the arginine system, and it is tempting to speculate that some of the unusual features of the way in which its dispersed genes are controlled could be accounted for if control were at translation. This conclusion must at present remain premature, however, because McClellan and Vogel have shown that synthesis of two of the enzymes of the arginine system suffers translational control; it should be shown next that the other enzymes behave in a similar way. And, of course, it will be necessary to develop an assay for arginine mRNAs to discover whether or not their transcription is controlled. Perhaps following the fate of the messenger RNA of the locus which contains four genes, and therefore more resembles a conventional operon, would help to reveal the mechanisms involved.

NUCLEIC ACIDS

Scanning for Detail

from our Biological Chemistry Correspondent

SPECTROSCOPIC studies provided the focus for the meeting in Oxford on December 11 of the Chemical and Biochemical Societies' Nucleotide Group. The virtues of nuclear magnetic resonance as a conformational probe for nucleic acid components were extolled by Dr D. B. Davies (Birkbeck College, London), with particular reference to the use of heteronuclear spin-decoupling at 220 MHz for nucleotides. The interactions between phosphorus and the ribose protons imply a planar, W-conformation for the four bonds between phosphorus and the 4′ hydrogen in the 5′ nucleotides, and the behaviour of the ring hydrogens suggests the existence of a dynamic equilibrium between the 2′ endo and 3′ endo-ribose conformations.

Two investigations of differential absorption spectra were described by Drs E. G. Richards (King's College, London) and I. O. Walker (Oxford). The former asserted that the ultraviolet absorption of RNA, unlike that of DNA, is independent of the sequence of bases and deduced a figure of 60 per cent for the extent of base pairing in 5S RNA, though this figure leans heavily on assumptions concerning the minimum length for a helical section. In contrast, the latter attempted no quantitative data fitting exercises. His results on solvent perturbation studies of oligonucleotide, DNA, and ribosome absorption spectra seemed to convince everybody of the underlying complexity of transitions buried under circular dichroism curves. These are unlikely to be interpreted by any simple theory of solvent effects.

Finally, temperature-jump studies were highlighted by Dr R. J. H. Davies (Queen's University, Belfast) with an account of the kinetic and equilibrium studies on triple stranded complexes formed from two pyrimidine oligonucleotides associating with purine monomers. The data may fit a model which possesses several looped, helical segments which dissociate to completion in succession as the temperature rises through the melting range.

One strong conclusion emerged from the day's proceedings; it remains a great deal easier to achieve a phenomenological analysis of spectral data than to correlate it with reality.

PLASMA LIPIDS

Triglyceride Turnover

from a Correspondent

THE emphasis at the colloquium on regulation of plasma lipid metabolism organized by the Biochemical Society at the Royal Postgraduate Medical School in London on December 18 was on problems rather than solutions. Professor L. A. Carlson (Department of Geriatrics, University of Uppsala) pointed out the difficulties encountered in measuring plasma triglyceride turnover rates in man. In any given situation, it was difficult to know whether hypertriglyceridaemia was primarily the result of triglyceride overproduction by the liver or underutilization by the extrahepatic tissues. Dr B. Lewis (Department of Chemical Pathology, Royal Postgraduate Medical School, London) also stressed that the mechanisms of hypertriglyceridaemia are poorly understood and he pointed to the many hormonal and dietary factors which have to be taken into account.

Both Carlson and Lewis agreed, however, that a reduction in the efficiency of triglyceride removal from the plasma is probably a major feature of several hypertriglyceridaemic conditions. Such removal is now known to occur through hydrolysis of the triglycerides, which are carried in the plasma in chylomicrons and very low density lipoproteins, by the enzyme clearing factor lipase or lipoprotein lipase, and this enzyme was the subject of the contribution by Dr D. S. Robinson (Department of Biochemistry, University of Oxford). At least one problem seems to have been settled here. Thus, there is much evidence suggesting that the enzyme functions at the surface of the capillary endothelial cells of the extrahepatic tissues and that the chylomicrons and very low density lipoproteins are sequestered at this site where their constituent triglycerides are hydrolysed. The free fatty acids released are then taken up by the tissues. But there is also evidence that the enzyme exists at other sites in such tissues—for example, it is found in the fat cells of adipose tissue—and this dual localization of the enzyme has been difficult to explain. It now seems, however, that the fat cell enzyme in adipose tissue may be the precursor of the functional enzyme at the endothelial cell surface. Nevertheless, when one problem is solved another is posed and there remains the question of how the enzyme is carried from the one site to the other.

The activity of the clearing factor lipase of particular tissues can alter markedly in different physiological situations and these changes are probably responsible for corresponding changes in the pattern of triglyceride uptake by the tissues. Robinson presented evidence which suggested that, at least in adipose tissue, these changes in enzyme activity are under hormonal control and that this is exerted, directly or indirectly, through changes in the tissue cyclic AMP concentration.

The question of whether cyclic AMP effects on this and other aspects of adipose tissue metabolism—for example, protein synthesis—are direct or indirect was taken up by Dr B. Jeanrenaud (Institut de Biochimie Clinique, Sentier de la Roseraie, Geneva). In isolated fat cell systems, changes in cyclic AMP levels brought about by a variety of hormones are accompanied by changes in free fatty acid and ATP concentrations which could be the true effectors. But the relevance of such changes in *in vitro* systems to situations *in vivo* remains to be shown.

Finally, the importance of cholesterol in relation to atherosclerosis was not forgotten. Dr N. B. Myant (Medical Research Council Lipid Metabolism Unit, Hammersmith Hospital, London) pointed out the difficulty of measuring the fractional rate of turnover of the plasma cholesterol (and of the total body cholesterol), stressing the need for more adequate methods, if only to assess the effectiveness and mode of action of treatments designed to reduce the concentrations of plasma cholesterol.