and the opening of treatment centres, and there was much discussion.

Could so much concentration on drug dependence actually intensify the very problems it is trying to solve ? To solve problems one has to understand them : drugs can, at the very least, be powerful short-cuts to wanted effects, and to discover the balance between these and unwanted ones is surely proper for science.

Collagen Meeting

from a Correspondent

THE third meeting of the Collagen Club, attended by about 70 people, took place on April 10 in the Department of Chemistry, University of Leeds. The morning was devoted to the topic of ribosomal biosynthesis of structural proteins introduced by Dr P. T. Speakman of the University of Leeds. Elucidation of coding mechanisms in the cell by which complex proteins are built up from their individual amino-acids has given impetus to this type of study, he said, and there was now a picture of the successive stages in the manufacture of haemoglobin by reticulocytes. But collagen biosynthesis is a little-explored field, and Dr Speakman reviewed his and others' experiments designed to demonstrate polysomes in collagen-synthesizing systems. So far, the results have not led to clear-cut conclusions. For instance, it has been shown that hydroxyproline-labelled polysomes from ^{14}C-proline-labelled chick embryo, though probably attached to cell membrane, had probably aggregated together by non-specific interactions between newly formed collagen chains. In other experiments very concentrated sucrose gradients (up to 60 per cent) had been used in the ultracentrifuge to search for collagen-synthesizing polysomes and, although hydroxyproline-labelled protein had been found on the gradients, sucrose of such a high concentration would prevent an accurate estimate of average polysome size or range of sizes. Dr Speakman thought that in most experimental work, large non-specific inter-polysomal aggregates were being examined and it is therefore impossible to infer from their size whether these polysomes are making a tropocollagen macromolecule, an α-chain or some sub-unit of an α-chain. It was clear from Dr Speakman's survey and the subsequent discussion that this type of study bristles with difficulties and presents a challenge to ingenuity.

In the afternoon, Dr Rosmus of the Central Institute for Food Research, Prague, spoke about cross-links in collagen. He dealt mainly with covalent cross-links formed between two adjacent polypeptide chains. He discussed in some detail those types of cross-linkage which can now be considered to be fairly well established. These include β-aspartyl ester and imide, aldol, Schiff base, glycosidic and metal cross-links. The recent demonstration of very small amounts of cystine in collagen suggests the presence of disulphide cross-links. No doubt others will be discovered but the best evidence for the existence of any particular cross-link would be derived from sequence studies. Of special interest was the likelihood that DOPA quinone (formed from oxidation of tyrosine) probably entered into cross-linking mechanisms. If an enzyme was responsible for the oxidation stage, it would, because of its size, only be able to approach and oxidize tyrosine residues before the macromolecules were formed. Dr Rosmus's audience included a number of people who were actively engaged in the study of collagen cross-links so his talk and the subsequent discussion comprised an authoritative and up to date survey of the subject.

Using Lasers

from a Correspondent

A ONE-DAY meeting on optical methods in atomic physics was held by the Optical Group of the Institute of Physics and the Physical Society on April 10 at the Culham Laboratory of the AEA. Five of the contributions dealt with applications of giant-pulse ruby lasers with output powers in the range 10^8 to 10^9 watt. These are now being used more or less as a routine for the measurement of electron temperatures and, often, electron densities from high temperature plasmas. The technique involves the analysis of the light scattered when such a laser beam passes through a plasma. Because Thomson scattering by free electrons is the important process, the Doppler width of the scattered line profile gives the electron temperature and its intensity yields the electron density. For temperatures of the order 200 eV, it is now possible to consider temperature measurement to an accuracy of 5 per cent to 10 per cent, and this has revived interest in the techniques of measuring collisional rate coefficients from plasmas. Such techniques depend on the coronal excitation equilibrium in which impact excitation is balanced by radiative decay. The total photon emission rate from a state is then given by the impact excitation rate to that state. The improved accuracy of plasma diagnostics implies that more meaningful comparisons with theoretical predictions are now possible. Departures from coronal equilibrium, attributable, for example, to metastable levels, can also be studied and give information on the rates of stepwise processes.

Under some conditions of electron density and scattering angle, the scattered laser light from electrons in a plasma undergoes co-operative interference and the spectrum can then give information on wave motions in the plasma—for example, ion acoustic or electron plasma waves. An interesting discussion at the meeting described a first observation by this technique of the enhanced wave motion occurring in the dissipation front of a collision-free shock wave.

Another use of high-powered lasers when focused on to solid surfaces is for the production of very dense plasmas, either for basic studies or for the generation of shock waves. Temperatures of 100 eV at electron densities of 10^{19} cm^{-3} can readily be obtained in this way.

Three further contributions dealt with other aspects of collision studies. The measurement of the degree of polarization of radiation emitted from electron-beam excited atoms poses a number of interesting optical problems, and some new methods were proposed. These studies require good energy resolution in the electron beam, since rapid changes of polarization with energy occur near the threshold. On the other hand, electron beam excitation carried out at much higher energies gives not only the excitation cross-section but also the f-value for the transition. Moreover, it is also possible to extract f-values by such means for optically forbidden transitions.