Summing up

WALTER H. ABELMANN

THE symposium was opened by *Drs Oakley and Olsen* with a review of the clinical, haemodynamic, and pathological spectrum of cardiomyopathy. The advances made since the last Ciba Symposium devoted to this topic 10 years ago were highlighted. The emphasis has shifted from classification to biological mechanisms and pathogenesis. Major areas of ignorance were identified. Although the technique of transvenous myocardial biopsy was introduced by Konno 10 years ago, it has not been taken full advantage of in the much needed attack on the unanswered questions.

The three following communications, by *Drs Richardson, Coltart and Harmjan* respectively presented the original Konno technique as well as their modifications and evaluations. It appears justifiable to conclude that, with care and experience, transvenous right ventricular biopsy, and perhaps even retrograde or transeptal biopsy of the left ventricle, may now be carried out without mortality and with acceptable morbidity.

Dr Olsen surveyed the histological, histochemical and ultrastructural analyses feasible with the small amount of tissue which can be retrieved. He presented evidence to the effect that clinically meaningful confirmatory or contradictory evidence could be furnished to the clinical cardiologist by this means in 59% of fifty-six patients so studied.

Dr Peters opened vistas into the future by presenting elegant techniques of analysis for marker enzymes of cell fractions (organelles) prepared from myocardial biopsy material.

Dr Brachfeld commented on the vagaries of the relationship between structure and function. His studies by means of perfusion techniques demonstrated that mannitol, which raises osmolality, may protect myocardium against ischaemic insult even though no biochemical effects are detectable.

In the afternoon, we were challenged by *Dr Burch* to consider acute damage by Coxsackie virus B₄ or by EMC virus to vascular endothelium as well as to myocardium as a possible precursor of cardiomyopathy, if not atherosclerosis.

Exciting new work was presented by *Drs Klein and*

Harmjan to the effect that ultramicroscopic changes in human ventricular myocardium may be observed after acute intravenous administration of ethanol, in amounts resulting in blood levels comparable to those found after social drinking. The significance of these findings was hotly debated.

Next *Dr Coltart* addressed himself to the clinically-observed poor response of patients with cardiomyopathy to digitalis glycosides. His study of distribution of labelled digoxin in different parts of the heart yielded evidence for a higher level of digoxin in microsomes of patients with cardiomyopathy, the mechanism and significance of which remain obscure.

Dr Rona introduced a new approach to the study of experimental myocardial damage using peroxidase and ferritin as tracers, and demonstrated an effect of blood pressure. This method promises to be useful in the detection of early damage to the membrane.

Dr Nayler presented her studies of a drug used in clinical medicine, which showed significant electromicroscopic alterations of the membrane, as an example of the biopsy approach to the study of drug action.

The papers presented at the symposium attest to the considerable advances made in recent years toward the elucidation of the pathogenesis of at least some cardiomyopathies, and point the way toward utilization of myocardial biopsy material in the further investigation of the still poorly understood diseases of heart muscle. Although clinical usefulness of myocardial biopsy may for some time to come have to take second place to scientific yield, further clinical applications are likely to develop.

Perhaps the most valuable part of the symposium was the free and extensive discussion ranging well beyond the topics covered in the formal presentations. Progress in the field of cardiomyopathies would appear to be well served not only by international and interdisciplinary communication, such as was exemplified in this symposium, but even more by multidisciplinary, international, collaborative research, as proposed at the last meeting of the Council on Cardiomyopathies in Singapore and re-emphasized at the present meeting by *Dr Oakley*.