With the European Society of Cardiology reaching its 50th birthday it is appropriate that we reflect on the last 50 years and view the future from this unique vantage point. The Nobel Prize for Medicine and Physiology has been in the last century the highest award that can be bestowed on a researcher. The discoveries that have led to our better understanding of the mechanism and consequently treatment of disease have played a unique part in alleviating morbidity and mortality. We felt that it would be appropriate at this time to try and discover the person who has contributed the most to the practice of cardiology in recent years. We therefore asked those who have already been acclaimed for their work, the living Nobel Prize Winners of Medicine and Physiology whose work relates to cardiology, this simple question. They were not permitted to nominate themselves or their collaborators, but were allowed to nominate anyone else. There were many worthy suggestions but there was one person who was elected by everyone and that was Professor Eugene Braunwald of Harvard Medical School.

Eugene Braunwald’s contribution has, and continues to be, on all fronts. He is first and foremost an outstanding doctor. His research contributions in the field of heart failure, ischaemic heart disease and more recently clinical trials have been unique. However, it may well be that his principal contribution is in the world of teaching. His text book *Heart Disease* has been an inspiration for doctors learning the importance of the science of cardiology and a unique source of knowledge and reference in the field. It is therefore a great honour for me to ask Eugene Braunwald to reflect on 50 years of cardiology and the challenges ahead.

KIM FOX
Editor in Chief

Fifty years of cardiology:
Brief reflections on the past and a look into the future

When I began my training in cardiology, as a medical student in New York in 1950, there were a number of major challenges in the field. For example the prevention of rheumatic heart disease had been made possible by the then newly available penicillin, but there were many logistical obstacles to a widespread preventive strategy. Heart failure was usually a pre-terminal condition, which occurred predominantly in patients with hypertension and valvular heart disease. Myocardial infarction was also a serious problem. It usually developed unexpectedly, like a bolt out of the blue, striking down previously asymptomatic persons, largely men, in the prime of life; treatment was symptomatic and both the early and later mortality rates were very high. Angina pectoris was difficult to manage and associated with a poor prognosis.

Now half a century later, in North America and Western Europe the prevalence of rheumatic heart disease is greatly reduced and overt congestive heart failure due to hypertension is rare. While sudden unexpected cardiac death remains a major problem, the outlook for patients with all other forms of ischaemic heart disease has improved dramatically. Clinical disability resulting from angina pectoris has been greatly reduced and although the total death toll of ischaemic heart disease remains high, on average, deaths due to this condition have been deferred by more than a decade.
and as a consequence lifespan has been extended dramatically.

This remarkable transformation in cardiology is surely one of the greatest success stories of twentieth century medicine. The principal advances responsible for this success have occurred in five major areas:

1. Procedural cardiology, notably cardiac catheterization, coronary angiography, electrophysiological studies, open heart surgery and most recently percutaneous coronary interventions; these procedures have revolutionized cardiovascular diagnosis and treatment;

2. The development and refinement of a variety of devices and instruments, including continuous electrocardiographic monitoring which serves as the basis for the modern coronary care unit; prosthetic cardiac valves, cardiac pacemakers, and both external and internal cardioverter–defibrillators;

3. Potent new pharmaceuticals, including the thiazide and loop diuretics, beta-blockers, angiotensin converting enzyme inhibitors, HmG-CoA reductase inhibitors and thrombolytics as well as a new appreciation of the value of an old drug — aspirin — and its use in all forms of ischaemic heart disease;

4. Non-invasive imaging techniques such as echocardiography and nuclear scanning for establishing precise anatomical diagnosis and physiological assessment of the circulation; and

5. The concept of coronary risk factors, which enables identification of persons at high risk of developing future coronary events, and the reduction of such events by the treatment of these risk factors.

I see several key challenges and opportunities for cardiology during the next few decades:

1. The need to enhance greatly the application of existing knowledge and to improve compliance with therapeutic and preventive regimens known to be effective. For example, the fraction of the hypertensive and hypercholesterolaemic populations that now achieve target ranges and must be increased while ‘unhealthy behaviours’ reduced. This challenge is analogous to that of disseminating prophylactic penicillin for rheumatic fever a half century ago.

2. Further improvement in the management of heart failure and arrhythmias. While we now deal far more effectively with these disorders than we did in 1950, they still represent major challenges, and in the case of heart failure, a rapidly growing problem. The development of reliable, simpler, less expensive and safer long-term ventricular assist devices as well as xenotransplantation are certain to improve outcome in heart failure.

3. The implications of the sequencing of the human genome on cardiovascular health. I believe that this represents the most important opportunity for cardiovascular medicine. This crowning achievement of modern biology, now imminent, should make it possible to identify, in children or even before birth, persons likely to develop individual risk factors in later life. It will then be possible to target prevention in quite a specific manner and to apply preventive strategies much earlier than is now possible. The molecular bases of disorders as diverse as congenital cardiac malformations, premature myocyte death, endothelial dysfunction, pro-coagulant states and sodium retention will be elucidated, paving the way to more effective molecular therapies of a broad range of cardiovascular disorders.

These three groups of advances, will together reduce profoundly the cardiovascular pandemic in developed nations and prevent its impending occurrence in the developing world.

It has been an exhilarating experience to have observed and participated in some of the spectacular developments in cardiology during the past half century. It is awesome now to contemplate how the next wave of progress in this field will influence all aspects of life in the new Millennium.

EUGENE BRAUNWALD