Editorial

Cardiology Divided

NOT more than 20 years ago, cardiology was exclusively a branch of internal medicine. As such, it relied on the general tools and methods accessible to clinical medicine of that period. Diseases of the heart were classified, their symptoms were catalogued, and their natural history was described. These efforts have borne valuable fruit: the signs and symptoms of coronary thrombosis have been described, the natural history of rheumatic heart disease has been outlined, and congenital diseases of the heart were classified. During this phase investigations on the heart and circulation, not directly connected with clinical facts, were carried out primarily in the physiologic laboratory. There was occasional cooperation between the physiologists and the clinical cardiologists. In the main, however, investigative efforts of the clinicians were directed toward exploiting a new tool, the electrocardiogram, and toward establishing its validity as a diagnostic aid.

The second phase began with the development of new tools and technics. The study of circulatory dynamics emerged from the physiologic laboratory and invaded the medical and even the surgical wards. Catheterization of the heart, angiocardiography, electrokymography, and ballistocardiography became instruments around which "cardio-respiratory" laboratories were formed in almost all teaching hospitals in the nation. In the beginning of this era, only 15 years ago, this was a virgin field. The progress since then has been so rapid, that scientific personnel to head and staff these laboratories has become scarce, and untrained clinicians are often recruited to fill the breach that should be occupied by physicians carefully trained in the physiologic technics. The rapid rise in the interest in circulatory dynamics is no coincidence. Catheterization of the heart and angiocardiography and, to a lesser extent, ballistocardiography and electrokymography, have become diagnostic tools. For better or for worse, they have become essential in the diagnosis of congenital heart disease, and left-heart catheterization promises to be of value in recognition and evaluation of lesions in the left side of the heart. Despite the overwhelming use of these technics for diagnostic purposes, their importance for physiologic studies on the circulation has not come to an end. Undoubtedly there is still much room for well trained and resourceful workers, as long as the technics are not used only as handmaidens of the clinician.

Within recent years cardiologists have come to the realization that in addition to the clinical cardiologist and the clinical investigator, workers in the fundamental sciences of biochemistry and biophysics can make considerable contributions to their discipline. Enzyme chemistry and biochemistry on a molecular level have furnished technics and, more important, ideas for the investigation of heart failure, myocardial anoxia, and myocardial metabolism in general. Energy production of the heart has been studied in tissue slices, or homogenates of normal and abnormal heart muscle, and in the whole heart in vitro and in vivo. Energy utilization of the heart has been

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investigated by a study of the contractile proteins of the heart muscle. These investigations have led to important findings: i.e., that the human heart utilizes primarily noncarbohydrate substrates; that myocardial failure seems to be the result of changes in contractile proteins; and that ischemia of heart muscle may lead to prolonged and reversible glycolytic changes in the myocardial metabolism.

It is clear that no one individual possesses either the training or the techniques available to master all 3 divisions of cardiology. As a result, workers in these divisions, as in the building of the tower of Babel, speak in different tongues and do not comprehend the aims of their fellow workers. There is the clinical cardiologist, interested in the physical signs of heart disease and usually well informed on electrocardiography and vectorcardiography. His is usually the responsibility for patient care. There is the clinical physiologist, who emphasizes dynamic alterations without much regard for physical signs, history, or treatment. And finally, there is the biochemist or biophysicist whose pursuits are even more academic and more remote.

A divergence of interests is as it should be. Without it individual progress is not possible. A lack of mutual understanding, however, is not conducive to medical progress. This does not imply that there should be centralization of all clinical and scientific labors. A cardiologist with a purely clinical orientation makes a poor director of a laboratory concerned with circulatory and biochemical studies, and a biochemist or physiologist is not likely to show much clinical judgment. How, then, can we avoid the growing schism of physicians and scientists interested in diseases of the heart?

The solution may well lie in the training of physicians interested in cardiology. Without falling into the pitfall of trying to learn everything and ending by knowing nothing, a young physician interested in cardiology should undergo clinical, physical, biochemical and biophysical training. One of these should later be his major pursuit according to his ability and inclination. But he should be made aware of the others through personal contact and through proximity in space. The space factor is often neglected, either through lack of facilities or, more often, through lack of understanding. Frequently one finds that the heart station, concerned with reading and mounting of electrocardiograms and the study of vectorcardiography, is far removed from the catheterization laboratory; this in turn often contains only the fluoroscope and some accessories, while the laboratory for gas analysis is housed either in a routine hospital laboratory or in a department of physiology. Finally, work on fundamental biochemical problems related to the heart is often being pursued across the street in a department of biochemistry. Whenever space permits, these units should be housed in close proximity.

The advance in clinical and fundamental cardiology within the last 10 years has been spectacular. Diversion and specialization have been the price. Efforts should now be made to bring individual branches of a great discipline back under one roof, both in an intellectual and a physical sense.

Richard J. Bing

These things then are as it were the parts, and the footsteps of the passage, and Circulation of the blood; to wit, from the right ear into the ventricle, out of the ventricle through the lungs into the left ear, then into the left ventricle, into the aorta, and into all the arteries from the heart, by the porosities of the parts into the veins, and by the veins into the Basis of the heart, the blood returns most speedily.—William Harvey De Circulatione Sanguinis, 1649.
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