

ACTA
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DE CORDIS SCIENTIA
CONVENTUS

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PARS PRIOR

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EXCERPTA MEDICA

PREFAZIONE

Nelle due precedenti riunioni della Società Europea di Cardiologia non è riuscito possibile pubblicare in estenso i rapporti e le comunicazioni in modo che rimanesse una documentazione durevole degli importanti contributi scientifici che hanno segnato il successo del I Congresso di Londra (1952) e del II di Stoccolma (1956).

Nell'assumere l'onorifico compito, benevolmente affidatomi dal Consiglio direttivo della Società, di organizzare il III Congresso a Roma mi sono proposto di realizzare la possibilità di offrire agli studiosi partecipanti alla manifestazione scientifica il testo delle conferenze, dei rapporti e delle comunicazioni prima dell'inizio dei lavori. Ciò soprattutto allo scopo di rendere possibile una più ponderata ed approfondita discussione sui problemi posti allo studio. Ho anche vagheggiato di pubblicare, oltre il testo integrale e il riassunto in più lingue, le figure illustrative delle conferenze, dei rapporti e delle comunicazioni in modo che i volumi degli atti venissero a costituire una antologia scientifica compiutamente curata dei contributi portati al Congresso e uno strumento di lavoro prezioso per gli studiosi.

E' stato possibile realizzare l'ambito programma mercé il generoso contributo di 50 milioni di lire che con legge di iniziativa parlamentare è stato erogato alla Società Italiana di Cardiologia per la organizzazione del III Congresso Europeo. Pertanto credo di interpretare i sentimenti dei cardiologi europei nel rivolgere anche a loro nome i sentimenti di vivissima gratitudine agli On. Presidenti del Senato e della Camera, agli illustri parlamentari che hanno presentato il progetto di legge e ai Presidenti e Membri delle Commissioni di Igiene e Sanità e delle Finanze del Senato e della Camera dei Deputati. I legislatori italiani hanno ancora una volta dimostrato la loro squisita sensibilità ai problemi dell'alta cultura e della salute pubblica.

La realizzazione pratica della pubblicazione tempestiva degli atti ci è stata resa possibile per la spontanea offerta della Excerpta Medica Foundation, che qui vivamente ringrazio nelle persone del Sig. J. Cauverien e E. van Tongeren, di mettere a nostro servizio la sua mirabile organizzazione editoriale. Mi sia consentito infine di rivolgere le più vive grazie ai miei impareggiabili collaboratori e soprattutto al Dr. A. Strano che ha curato il ponderoso lavoro della raccolta e della coordinazione del materiale scientifico.

Prima dell'inizio dei lavori delle sezioni, i Signori Congressisti verranno in possesso del I volume degli atti contenente il testo completo delle conferenze nelle quattro lingue ufficiali del Congresso e i rapporti dei diversi simposi e tavole rotonde nel testo integrale e nei riassunti in più lingue, del II volume contenente il testo integrale delle comunicazioni e di un fascicolo in cui sono raccolte le allocuzioni che verranno lette nella seduta inaugurale.

Le discussioni che si svolgeranno durante i lavori del Congresso saranno raccolte, coordinate e successivamente pubblicate in un terzo volume che sarà distribuito pochi mesi dopo il Congresso.

I volumi non saranno privi di pecche e manchevolezze e di ciò chiediamo venia anticipatamente al benevole lettore che ci vorrà assolvere per le nostre buone intenzioni.

Prof. Luigi Condorelli
Presidente del III Congresso
Europeo di Cardiologia

PREFACE

Lors des deux précédentes assemblées de la Société Européenne de Cardiologie, il n'a pas été possible de publier in extenso les rapports et les communications pouvant assurer une documentation durable au sujet des apports scientifiques importants qui ont été faits et qui ont assuré le succès du premier Congrès de Londres (1952) et du deuxième Congrès de Stockholm (1956).

Le Conseil de Direction de la Société m'a bénévolement offert d'organiser le troisième Congrès à Rome. J'ai accepté d'assumer cette tâche honorifique, en me proposant de faire tout ce qui est possible pour pouvoir remettre aux savants participant à cette manifestation scientifique, avant le début des travaux, le texte des conférences, des rapports et des communications. Ceci, principalement dans le but de leur permettre de se pénétrer des problèmes soumis à l'étude pour pouvoir en discuter d'une façon approfondie. Mon désir aussi était de publier, en plus du texte intégral et du résumé en plusieurs langues, les figures illustrant les points traités dans les conférences, dans les rapports et dans les communications, afin que les recueils de nos travaux constituent une anthologie scientifique complète des contributions apportées au Congrès et un instrument de travail précieux pour les savants.

Il a été possible de réaliser le programme conçu, grâce à une généreuse contribution de 50 millions de lires accordée, en application d'une loi votée à l'initiative du Parlement, en faveur de la Société Italienne de Cardiologie pour l'organisation du troisième Congrès européen. Je crois donc interpréter les sentiments des cardiologues européens en exprimant également en leur nom nos sentiments de très vive reconnaissance à Messieurs les Présidents du Sénat et de la Chambre, aux illustres Membres du Parlement qui ont soumis le projet de loi ainsi qu'aux Présidents et Membres des Commissions de l'Hygiène et de la Santé et des Finances du Sénat et de la Chambre des Députés. Les législateurs italiens ont, une fois de plus, montré leur délicate attention à l'égard des problèmes de la haute culture et de la santé publique.

S'il a été possible de publier à temps les travaux de notre congrès, c'est grâce à l'offre spontanée de la 'Excerpta Medica Foundation' que je remercie vivement ici, dans les personnes de MM. J. Cauverien et E. van Tongeren, d'avoir mis à notre service sa merveilleuse organisation d'édition.

Qu'il me soit permis enfin d'adresser mes plus vifs remerciements à mes incomparables collaborateurs, et surtout à M. le Dr. A. Strano, qui a pris à sa charge le lourd travail de réunir et de coordonner le matériel scientifique.

Avant que ne commencent les travaux des sections, Messieurs les Congressistes seront en possession du premier volume des travaux contenant le texte complet des Conférences dans les quatre langues officielles du Congrès ainsi que les rapports des divers symposiums et tables rondes dans le texte intégral et dans des résumés en plusieurs langues, du deuxième volume, contenant le texte intégral des communications, et d'une brochure dans laquelle sont recueillies les allocutions qui seront lues à la séance inaugurale.

Les discussions qui auront lieu pendant les travaux du Congrès seront réunies, coordonnées et publiées par la suite dans un troisième volume qui sera distribué quelques mois après le Congrès.

Les volumes ne seront pas exempts de fautes et d'imperfections, ce dont nous prions, à l'avance, le bienveillant lecteur de nous excuser, en voulant bien tenir compte de nos bonnes intentions.

Professeur Luigi Condorelli
Président du 3ème Congrès
Européen de Cardiologie

FOREWORD

It has not been possible to publish the complete reports and communications presented at the past two congresses of the European Society of Cardiology, and thereby provide a lasting documentation of the important scientific contributions which marked the success of both the First Congress, held in London (1952), and the Second Congress in Stockholm (1956).

When the Executive Council of the Society honoured me with the task of organizing the Third Congress in Rome, I proposed to make it possible that those attending the congress would receive the text of the conferences, reports and communications before these were delivered. This would have the important advantage of making possible a more circumspect and profound discussion of the problems in question. I further hoped to publish in addition to the complete texts and the summaries in several languages, the illustrative figures of the conferences, reports and communications, so that the volumes of the proceedings would constitute a scientific anthology, consisting exclusively of contributions delivered at the congress - a valuable document on cardiology. It proved possible to fulfil these desires, thanks to the generous contribution of 50 million lire, which was granted to the Italian Society of Cardiology, by Act of Parliament, to organize the Third European Congress. We believe, therefore, that we may speak on behalf of all European cardiologists in expressing our sincere gratitude to the Hon. President of the Senate and House, to the members who have presented the project and the presidents and members of the Committees on Hygiene, Health and Finance of the Senate and Chambers of Deputies. The Italian legislators have once more demonstrated that they have an open eye for the problems of our culture and public welfare. The timely publication of the proceedings has been realized by the spontaneous offer of the Excerpta Medica Foundation to put its admirable editorial organization at our disposal. In the persons of Messrs. J. Cauverien and E. van Tongeren, this Foundation, also, has our sincere gratitude.

Furthermore, I want to express my extreme gratitude to my incomparable collaborators and particularly to Dr. A. Strano, who has carried out the difficult job of collecting and coordinating the scientific material. Prior to the beginning of the sessions the participants of the congress will receive vol. 1 of the proceedings, containing the complete text of the lectures in the four official languages of the congress, the reports on the various symposia and round-table conferences, with complete text and summaries in several languages, and a small volume containing the addresses delivered in the opening session.

The discussions held in the course of the congress will be recorded, coordinated and subsequently published in a third volume which will be distributed a few months after the congress.

These volumes will not be free from errors and imperfections, and we should like to ask the readers, in advance, to excuse us and to consider our good intentions.

Prof. Luigi Condorelli
President of the Third European
Congress of Cardiology

VORWORT

Es ist nicht möglich gewesen, die anlässlich der letzten beiden Kongresse der Europäischen Gesellschaft für Kardiologie gebotenen Vorträge und Mitteilungen in ihrer vollständigen, unverkürzten Form zu veröffentlichen und dadurch eine dauernde Dokumentierung der wichtigen wissenschaftlichen Beiträge zu liefern, die den Erfolg des Ersten, 1952 in London abgehaltenen wie auch des Zweiten, 1956 in Stockholm abgehaltenen Kongresses gekennzeichnet haben.

Als der Exekutivrat der Gesellschaft mich mit der Aufgabe beehrte, den Dritten Kongress in Rom zu organisieren, machte ich den Vorschlag, die Kongressteilnehmer bereits vor der Abhaltung der Konferenzen, Vorträge und Mitteilungen in den Besitz des Textes der genannten Veranstaltungen zu stellen. Dies hätte den bedeutenden Vorteil, eine umsichtiger und eingehendere Diskussion des fraglichen Problems zu ermöglichen. Ich hoffte, weiterhin, zusätzlich zu den vollständigen Texten und Zusammenfassungen in mehreren Sprachen die bei den Konferenzen, Vorträgen und Mitteilungen verwendeten Illustrationen veröffentlichen zu können, so dass die schriftlich niedgelegten Verhandlungen des Kongresses eine wissenschaftliche Anthologie bilden würden, die ausschliesslich aus den anlässlich des Kongresses dargebotenen Beiträgen bestünde - ein wertvolles Dokument über Kardiologie. Es hat sich, dank der grosszügigen, durch einen Parlamentsakt der Italienischen Gesellschaft für Kardiologie zur Organisation des Dritten Europäischen Kongresses gewährten Spende, als möglich erwiesen, diese Wünsche zu erfüllen. Wir glauben daher im Namen aller europäischen Kardiologen sprechen zu dürfen, wenn wir dem geehrten Herrn Senatspräsidenten, den Mitgliedern, die das Projekt vorgestellt haben sowie den Vorsitzenden und Mitgliedern der Komitees für Hygiene, Gesundheit und Finanzen aus dem Senat und den Abgeordnetenkammern unsere aufrichtige Dankbarkeit bezeugen. Die Gesetzgeber Italiens haben wieder einmal bewiesen, dass sie ein offenes Ohr für die Probleme unserer Kultur und der Volkswohlfahrt haben. Die rechtzeitige Veröffentlichung der Abhandlungen ist durch das spontane Angebot der Excerpta Medica Foundation, uns ihre bewunderungswürdige Verlagsorganisation zur Verfügung zu stellen, zustande gekommen. Auch dieser Stiftung gilt in den Personen der Herren J. Cauverien und E. van Tongeren unser aufrichtiger Dank.

Weiterhin möchte ich meinen unvergleichlichen Mitarbeitern und insbesondere Dr. A. Strano, der die schwierige Aufgabe, das wissenschaftliche Material zu sammeln und zu ordnen übernommen hat, meinen innigsten Dank aussprechen.

Vor Beginn der Sitzungen werden die Kongressteilnehmer Band I der Verhandlungen, der den vollständigen Text der Vorlesungen in den vier offiziellen Sprachen des Kongresses, die Berichte der verschiedenen Symposia und Round-Table-Konferenzen mit vollständigem Text und Zusammenfassung in mehreren Sprachen enthält und einen kleinen Band mit den anlässlich der Eröffnungssitzung gehaltenen Ansprachen erhalten.

Die im Laufe des Kongresses abgehaltenen Diskussionen werden aufgezeichnet, geordnet und in der Folge in einem dritten Bande, der einige Monate nach dem Kongress verteilt werden soll, publiziert.

Diese Bände werden nicht frei von Fehlern und Unzulänglichkeiten sein. Daher möchten wir unsere Leser im voraus um Entschuldigung und Berücksichtigung unserer guten Absichten bitten.

Prof. Luigi Condorelli
Präsident des Dritten Europäischen
Kongresses für Kardiologie

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NEW WAYS FOR OLD IN CARDIOLOGY

by

D. E. BEDFORD

London, England.

At the end of the last century, the diagnostic methods employed in cardiology comprised feeling the pulse, and inspection, palpation, percussion and auscultation of the heart. The sphygmograph, after enjoying a considerable vogue, had fallen into disfavour, and practical sphygmomanometers of the Riva-Rocci type had not yet come into general use, though Von Basch, Potain, and other pioneers were employing primitive pressure gauges in their clinics.

OLD WAYS

The oldest of these diagnostic methods is palpation of the pulse at the wrist, and according to legend, Chinese and Hindu sphygmology dates back into antiquity to long before the birth of Hippocratic medicine. In Europe, in spite of the sphygmograph, pulse doctrines changed little from Galen's time until the publication of Mackenzie's 'Study of the Pulse' in 1902.

Palpation of the heart was practised by Albertini of Bologna early in the 18th century, but was first taught and popularized by Corvisart in his clinic at the Charité Hospital in Paris. Corvisart was indeed the founder and first great teacher of clinical cardiology. He translated and annotated Auenbrugger's *Inventum Novum*, first published in Latin in 1761, and introduced percussion into practice. He was able to diagnose valvular disease by means of palpable vibrations, later called by Laennec *frémissement*, and by English contemporaries the purring thrill or tremor. Corvisart's famous *Essai sur les Maladies et les Lésions Organiques du Cœur et des gros Vaisseaux*, published in 1806 and translated into English in 1813, was not only the first text-book on clinical cardiology, but for long remained the most important one.

Direct auscultation of the heart was practised in Corvisart's clinic by his assistants, Bayle and Laennec, and it fell to the latter to introduce mediate auscultation with the stethoscope in 1819. Laennec's discovery of two sounds to each heart beat, and of valvular murmurs, must certainly rank as one of the greatest contributions of all time to cardiology, for it set in motion an intensive investigation of the clinical signs of heart disease. Early in the present century, Allbutt was at work with the sphygmomanometer and succeeded in separating hyperpiesia not only from Bright's disease but also from atherosclerosis. Mackenzie, Wenckebach, and Vaquez were occupied in investigating the arrhythmias by the polygraph, soon to be superseded by Einthoven's galvanometer, by means of which Thomas Lewis, and Winterberg and Rothberger identified auricular fibrillation in man. Moritz, Dietlen, and Assmann in Germany, and Vaquez and Bordet in France, were exploring the heart and great vessels by roentgen rays, and soon the radiological method was adopted as part of our routine clinical examination of the heart.

These new diagnostic tools, the sphygmomanometer, the polygraph, the electrocardiograph, and the fluoroscope or orthodiagraph, were applied by the physician himself directly to his patient, and the information they provided was incorporated into the clinical picture as a whole, and so assessed in proper perspective. In this way, these procedures, though instrumental, remained essentially clinical, that is appertaining to the bedside and the consulting room rather than to the laboratory.

NEW WAYS

The cardiologist of today has at his disposal an imposing array of new diagnostic weapons and some of the old ones have been improved. Electrocardiography employs twelve leads instead of three, and undoubtedly the use of unipolar leads has greatly increased its scope in diagnosis.

Vectorcardiography represents a new method of portraying the electrical forces generated by the heart. In theory, all electrocardiographic leads are derivatives of the spatial vectorcardiogram which represents the same electromotive forces but in a different way. Whatever the theoretical advantages of the vectorial method, it is no easy matter after half a century of speaking one language to change to another, but until it is decided which is the better for clinical purposes, we must continue to be bilingual and Dr. Robert Grant has taught us a simple method of translation.

Phonocardiography dates back about 50 years, but technical difficulties delayed its routine clinical use until Rappaport and Sprague clarified the physical laws which govern auscultation and graphic recording of the heart sounds. Pioneer work on the clinical applications of phonocardiography by Lian, Leatham and others has now so purified auscultation that we only need graphic records for special purposes.

Cardiac radiology has been amplified by kymography, and tomography, but the greatest advance has been the introduction of angiocardiology by Castellanos in 1938. This method is not without hazard to the patient but properly conducted it may be of great value in the diagnosis of congenital heart disease and also of aneurysm, pericardial effusion, and obstruction of the vena cava.

Ballistocardiography is a novel graphic method which, to the uninitiated, inscribes waves of a peculiar kind. An abnormal ballistocardiogram is common in all forms of heart disease, including coronary disease, and is not uncommon in apparently healthy subjects over 40, or after smoking. Basal conditions are therefore important and patients must be instructed to omit their benzedrine and to refrain from smoking prior to the test. The importance of basal conditions in testing the heart was of course recognized long ago, and Sage Kanad, a Hindu sphygmologist of antiquity, gave the following directions as to when to feel the pulse - 'in the morning when both physician and patient, after performing their respective morning duties, are comfortably settled, the former should feel the pulse of the latter'.

Cardiac catheterization represents the greatest advance in the diagnosis of heart disease since Einthoven invented the string galvanometer. A century ago, Chauveau, a veterinary surgeon of Lyons, in cooperation with Marey, successfully passed a catheter via the jugular vein into the right heart cavities of living and unanaesthetized horses, and thereby recorded the pressure in the lesser circulation. In 1928, Forssman, in a bold experiment on himself, did the same in living and unanaesthetized man. This paved the way for Cournand, McMichael, Lenègre, and many others to develop catheterization as a safe procedure. For the first time, this brought the pulmonary circulation within our reach and put pulmonary hypertension on the clinical map.

Lastly, but certainly not least in importance, I must refer to the great contributions which surgery has made to cardiology. Over 50 years ago, Allbutt sought to show that when medieval physicians came to regard surgery as unfit for scholars and gentlemen, medicine lost the main laboratory at her service, namely the laboratory of living processes, and he foresaw that out of the mouths of barbers and cutters rather than the pharisees of the colleges, medicine would breathe future messages to her children. In England, the contributions of surgeons to cardiology go back a long way. The first textbook on heart disease in English was written by Allan Burns, lecturer on anatomy and surgery at Glasgow, and the second text-book was also written by a surgeon, Joseph Hodgson of Birmingham, whose treatise on Diseases of the Arteries, published in 1815, was translated into both French and German, and even today the term 'maladie de Hodgson' is used in France. Adams of Adams-Stokes syndrome was surgeon to a hospital in Dublin. Modern surgeons have restored our laboratory of living processes so that we can now correlate

clinical and physiological with anatomical findings, and this has taught us much about valvular and congenital heart disease.

NEW WAYS FOR OLD

Some of the new diagnostic methods which I have mentioned, unlike those of yesterday, cannot readily be applied by the physician himself directly to his patient, for trained teams of technical workers are often required, and much time is consumed. They are indeed essentially laboratory rather than clinical procedures.

In the past, the advent of novel instrumental methods always aroused opposition. Laennec was ridiculed as a 'cylindromaniac', clinical diehards claimed that the erudite finger was the best pressure gauge, and championed percussion against radioscapy in estimating the size of the heart. Today as Paul Wood has written, we are in danger of losing our clinical heritage and of putting too much faith in figures thrown up by machines. Often we are tempted to use a diagnostic searchlight when a pocket torch would do as well or even better and prove less irksome to the patient. In this respect a warning note was sounded at our Paris Congress in 1950 by Samuel Levine who condemned indiscriminate and unnecessary laboratory investigations when simple bedside tests, properly interpreted, would provide the answer.

Today, the tempo of advancing knowledge gets ever faster compared with the past, when for 14 centuries to know Hippocrates and Galen was quite enough, yet even this was not too easy for genuine versions of their works were hard to come by and Anutius Foesius of Metz took 40 years in compiling his concordance of Hippocrates. Twelve years elapsed between Harvey's discovery of the circulation and the publication of *De Motu Cordis*. Osler said that Harvey knew too much to write, but today we do not suffer from any such handicap, and far more is written than we can know or comprehend.

The new climate in which we work is raising many problems for those in charge of patients, and responsible for teaching students and postgraduates.

SOME LESSONS FROM HISTORY

A wise man judges present by past events, for to neglect the past in science means that it must be recommenced every day. History shows that cardiology has advanced along three main pathways. First, the Hippocratic method of clinical observation and experience; secondly, the experimental method of Harvey; and thirdly, the anatomico-clinical method founded by Morgagni and proverbially perfected by Skoda and Rokitsansky. Dissect in anatomy, experiment in physiology, follow the disease and make the necropsy in medicine was the spirit of the age. Though the method of Skoda and Rokitsansky was overdone, we must not underestimate its great contribution to cardiology. Thanks to Laennec's stethoscope, and the correlation of physical signs with post-mortem findings, clinical cardiology advanced as never before in the first half of the 19th century. Even in these days, necropsy control constitutes a hall-mark not to be despised, and Cabot's book, *Facts on the Heart*, will never become out of date.

The next stage of our progress was a reaction from conceptions of heart disease based on dead-house pathology towards conceptions based on function. Just as Virchow rebelled against purely anatomical thinking in pathology, so Mackenzie was the first to do so in cardiology, when he switched our attention from signs to symptoms, from structure to function, and from the valves to the myocardium as the key to heart failure.

Some confusion of thought has arisen as to what the experimental method implies. It has quite wrongly become identified with the laboratory and with instrumentation, yet Harvey and Stephen Hales had no laboratories, and Withering's work was conducted outside hospital in his practice, yet his clinical experiment with digitalis laid the foundation stone of cardiac therapeutics. The experimental method means the testing out of an hypothesis,

and admittedly this is more easily done under controlled conditions in the laboratory than in the wards, yet whether we use the method or not depends on our attitude of mind rather than on our environment. A few examples from history will illustrate how these different methods of investigation have all contributed to our progress.

The pulse

The pulse was much studied in Galen's time, and what the finger felt was recorded, classified, and correlated with the clinical course of such diseases as were then recognized. But without Harvey's discovery, rational interpretation of the pulse was impossible, so that clinical observation ran riot and sphygmology became grotesque.

With the advent of auscultation, the pulse soon fell into disrepute, and Laennec held that it had little value as a guide to the circulation. Next comes the sphygmograph, and at once a new scientific method of investigating the heart is acclaimed. Yet all that happened was that the classical pulses of Galen were replaced by a profusion of sphygmograms, one for every disease under the sun from cholera to jaundice, even including one for mercurial poisoning. So, in 1898, Gibson wrote of the sphygmograph as follows: 'It is unnecessary in diagnosis and useless in prognosis, and it is therefore of no value in the treatment of disease'. This was probably true at the time yet within a few years Mackenzie's Study of the Pulse appeared, and once more, graphic records of the arterial and venous pulses became a decisive guide to cardiac function. As the polygraph was replaced by the electrocardiograph, so the pulse tracing again disappeared from the clinic. Today, the arterial pressure tracing is back again in favour, and is proving, as in Mackenzie's day, a good means of timing events in the cardiac cycle, and of value in assessing the degree of aortic stenosis.

At the bedside, however, and armed with the knowledge derived from physiological experiment, we can still employ with profit Galen's method of feeling the pulse at the wrist, and we still teach our students to recognize some of the very pulses described by him.

Auscultation

Let us glance back at auscultation. When Laennec made the fundamental discovery that there were two heart sounds to each beat, he also made a fundamental error in attributing the first sound to the ventricles and the second to the auricles, a mistake he need not have made had he been familiar with Harvey's work. Within a short space of time, a galaxy of theories, some of them quite grotesque, were postulated to explain the heart sounds, and this controversy was only settled by the animal experiments of Hope and Williams who correctly correlated the sounds with events in the cardiac cycle, and identified the murmurs of valvular incompetence and obstruction.

Next, Hope and others enunciated what Forget called the law of retro-dilatation or back-pressure to explain the clinical manifestations of heart failure, and much solid evidence was accumulated to support this view. However, Mackenzie, dissatisfied with murmurs as a guide to prognosis and treatment, and impressed by the importance of auricular fibrillation as a cause of heart failure, rejected the idea of back-pressure in favour of the so-called forward failure theory, based largely on hypothesis. Modern techniques of investigating the circulation have shown that the back-pressure theory provides a good working explanation of many of the clinical signs and symptoms of heart failure, and certainly the benefit resulting from mitral valvotomy has shown beyond all doubt that the mechanical effects of valvular obstruction are far more important than Mackenzie believed. Nevertheless we now know that impaired renal function with sodium retention is due to forward failure, and so Mackenzie's clinical hypothesis has been vindicated, but his outright condemnation of the older view proved wrong.

In 19th century text-books on the heart, much space was devoted to mitral regurgitation and students were taught to distinguish organic from functional mitral systolic murmurs. Graham Steell was the first to cast doubt on the diagnosis of mitral incompetence and Mackenzie and Lewis, with a strong support from Cabot, succeeded in virtually banishing it from

English text-books. Cabot, in *Facts on the Heart*, discusses mitral regurgitation under two headings, namely 'Does it exist?' and 'Can it be diagnosed in life?' and concludes that if it probably exists as a great rarity, it is not a clinical entity for it cannot be recognized in life. Today mitral regurgitation has been resurrected, the surgeon can vouch for it, new techniques are devised to detect it, and new operations to cure it. I must state that outside English-speaking countries, mitral incompetence always received better treatment. In his bias against murmurs, Mackenzie even suggested that the stethoscope had hampered progress, but with the development of cardiac surgery, auscultation has become more and more important. Not in vain did Potain spend a lifetime at the bedside studying the heart sounds, for today his 'opening snap' is one of our most valuable signs of a pliant and therefore operable mitral valve.

Congenital Heart Disease

Lastly, let us take a glance back at congenital heart disease in which field amazing advances have been made in the last 20 years. In 1899, Bard and Curtillet observed the late onset of cyanosis in a patient found at necropsy to have a patent foramen ovale, and they correctly postulated a reversal of the atrial shunt to explain this. Maude Abbott saw the significance of this hypothesis which she incorporated in her classification of congenital heart disease (1924), and Moschowitz (1927) predicted pulmonary hypertension as the cause of reversed shunts and cyanose tardive. Gradually, by anatomico-clinical correlations, and with the help of radiology, the clinical picture of atrial septal defect was established, and a left to right shunt was correctly presumed. Finally cardiac catheterization has confirmed the direction of the shunt and its occasional reversal by pulmonary hypertension. Once a means of certain diagnosis had been achieved, surgical closure of atrial septal defects could be envisaged, and today this is a standard procedure in cardiac surgery. It was soon realized, however, that some anatomical types of atrial septal defect could not safely be closed under hypothermia, so we were stimulated by surgical needs to greater accuracy in diagnosis, and now we can recognize the main anatomical types of atrial septal defect with fair certainty by clinical means.

Dr. Helen Taussig, using the Hippocratic method of clinical observation, noticed the deterioration which occurred in certain cyanosed babies when the ductus arteriosus closed. She not only noticed it, but saw its therapeutic implications, hence the Blalock operation was conceived. The success of this operation, first performed in 1944, gave a tremendous impetus to cardiac surgery. The dramatic restoration of gravely disabled blue children to reasonable comfort and activity not only emboldened surgeons to extend their field, but raised new hope for patients with heart disease, and encouraged them to face the hazards of surgery. As Bailey has justly said, but for the success of the Blalock operation, intracardiac surgery might have been delayed in its advance for many years. So we see how a chance clinical observation befalling a receptive mind can even today set the machinery of research in motion, and pave the way to immense progress in treatment.

These examples from history suffice to show how, in the forward surge of knowledge, opinion is never static, and how sound ideas come in and out of fashion. We also see how the working hypothesis of the clinic may anticipate the later results of physiological investigation. The advent of novel diagnostic tools, and of new ideas, is not ipso facto a good reason for throwing our old ones overboard, but rather a reason for reassessing their usefulness and defining their proper scope.

THE CLINICAL METHOD

The Hippocratic method of clinical observation has served us well in the past and may be just as scientific as laboratory methods but it is much more difficult and, moreover, needs constantly keeping up to date. In the past, our clinical conceptions of heart disease were shaped in anatomical moulds to which, later, radiology lent support. Now the time has come to incorporate

new physiological knowledge into our clinical patterns of heart disease. To take a simple example, where we used to think of aneurysmal dilatation of the pulmonary artery we now think in terms of increased flow, increased pressure, and high or low vascular resistance. Unfortunately, while anatomical patterns can be simply expressed and understood, physiological patterns are apt to be expressed in terms of complicated mathematical formulation.

Lewis, despite a lifetime spent mainly in the laboratory, always insisted on the need for simplicity of thought and language in the wards, and he sought to translate the knowledge derived from experiment into simple laws applicable to clinical work. Lewis never despised the clinical method, but he strove to purify it. We must constantly incorporate the lessons of haemodynamics, of phonocardiography, and of biochemistry into our clinical concepts and teaching, and we must translate these lessons into simple clinical language. In this respect Lewis was a master, and no better example of it can be given than his small book, *Clinical Disorders of the Heart Beat*, in which he showed how the knowledge derived from graphic methods could be applied quite simply at the bedside.

Amidst the avalanche of advancing knowledge we need to orientate ourselves correctly. We must not allow enthusiasm for things which seem new to deflect us from making full and proper use of existing knowledge and of proven diagnostic tests. All new and elaborate methods of investigation draw heavily on skilled medical man-power, and add to the cost of illness and its treatment. In England, this cost now falls mainly on the State, which means on the taxpayer, and one might have imagined that he would favour economic methods but he does not. On the contrary, State medicine has led to an incessant and increasing demand by the British public for hospital and laboratory investigation of every sort of complaint, not to mention an increasing thirst for expensive medicines.

Investigation must start from the history and clinical examination, and if the first step goes wrong, the next is likely to follow, so that we become side-tracked into fruitless tests and valuable time is lost. One sees this happening day after day in practice. A great responsibility falls on those of us who are responsible for teaching students. Surrounded by enthusiastic assistants, each preoccupied with some special research project, and with our laboratory colleagues near at hand, it is easy to wander from the straight and narrow path which should lead from clinical examination, via essential tests, to diagnosis and treatment, and to become acquiescent in investigations which are neither necessary nor helpful. The testing out of a new diagnostic procedure involves its widespread use at the start for research purposes, but the student may fail to distinguish between research and practice, and so he gets the idea that diagnosis consists in ordering a series of tests and awaiting the results. For example, pulmonary hypertension is readily recognized by its clinical signs, radiograph, and electrocardiogram, and if we find this evidence of it in a case of mitral stenosis, the indications for surgical treatment may be quite clear cut. If we undertake catheterization in such a case we should emphasize why, otherwise the student comes to believe that catheterization is necessary in every case of mitral stenosis before the question of surgical treatment can be decided. If we set a good example, students will follow it, and therefore we should try to preserve a meticulous bedside technique in which, after clinical examination, we size up the situation in proper perspective and plan our further investigations in logical sequence, each one having some purpose which should be made clear.

In making a plea for preservation of the clinical method of investigation, and in emphasizing its contribution to cardiology in the past, I do not underestimate the great contributions of physiological research and of laboratory investigations such as we have at our disposal today, but I hold that these two methods are complementary and need close integration. Here in Europe, where we have inherited our clinical traditions from many great masters of cardiology in the past, I have no fear that my remarks will be misunderstood.

Up to recent times, cardiology has belonged to clinical medicine, and has been largely in the hands of physicians with long training at the bedside. The advent of the electrocardiograph and the fluoroscope did not seriously

affect its clinical status, but today there is a danger of severing cardiology from medicine and already the term 'cardiovascular laboratory' is in common use. Yet however elaborate and decisive our laboratory tests may seem, it is unlikely that they can ever become a substitute for diligent clinical observation and for wisdom gained by long experience at the bedside. In an editorial entitled 'Cardiology Divided', Professor Richard Bing pleaded the need to bring the various branches of cardiology back under one roof, both in a physical and an intellectual sense, and we must certainly guard against dividing ourselves into a camp of doctors and a camp of investigators.

By personal investigation and experiment, Harvey worked out the essential physiology of the circulation single-handed, but today some division of labour has been forced upon us. Yet however we divide our forces, and whatever new tools we may employ, there is only one road to Science, as Harvey stated, that to wit by which we pass from things more known to things less known. Future progress along this road will much depend on how effectively we organize our cardiological man-power. We need to build up a united team inspired by a common purpose, namely to seek out the secrets of nature by way of experiment, as Harvey exhorted us to do, and to apply the fruits of our labours as expeditiously as possible to the benefit of our patients.