The Harveian Oration

ON

"CLINICAL SCIENCE"

DELIVERED BEFORE THE ROYAL COLLEGE OF PHYSICIANS
OF LONDON ON OCTOBER 18th, 1933

BY

SIR THOMAS LEWIS, M.D., F.R.S., F.R.C.P.

PHYSICIAN IN CHARGE OF THE DEPARTMENT OF CLINICAL RESEARCH,
UNIVERSITY COLLEGE HOSPITAL

All in this College know that William Harvey discovered the circulation of the blood. But the movement of blood through the lungs had already been suggested by his predecessors. Harvey discovered the systemic circulation, and realized that this and the pulmonary circulation are but integral parts of one continuous movement. When it is asked what we owe to Harvey this forms the almost constant answer. Yet I venture to state that it is not the achievement which should chiefly be acclaimed, or that it should not be acclaimed in this form. There is little doubt that Harvey's discovery could not long have been delayed. Other workers had come very near to suspecting the fact; with the microscope once introduced it could not remain concealed. How and when the first clear statement would have come, had Harvey remained silent, would be a matter of profitless conjecture. It actually came from Harvey, and we are content to rest on that fact. Revolutionary as was his discovery in its time, far-reaching in its subsequent developments, yet the conclusion was not the best that Harvey gave us. The outstanding quality of Harvey's work lies in his statement of a case, in the lucid nature of his argument, and the finality of his proof. He presents to us a train of methodical and exact observation and experiment, carried forward hand in hand with close and finished reasoning, brilliant for its simplicity and for its power of conviction. His book is a romantic example of scientific exposition, unsurpassed at his time and since his time. *De Motu Cordis* holds its reader entranced, while each stretch of the path brings a surer promise of the approaching vista; and when the path ends it ends on the hill-top, and there is unfolded to our gaze a land that is ours with certainty, ours for all time. This culmination brings with it a sense of security and accomplishment that fills us with profound and lasting emotion; and we go forward to hold what he has given us with a great thankfulness to this pioneer, who has not only led us to a new country, but has inspired us and taught us how farther to explore.

Harvey has been termed the Father of Physiology: he was much more than that, for his child was Clinical Science, out of which physiology and pathology were afterwards born. Prompted and inspired by clinical observation and by dissections of the dead body, he proceeded farther by the method of experiment, using both man and animals, and harvesting and binding into one whole his abundant evidences. He bequeathed his method to us in his immortal book.

Since his time knowledge has grown apace, and where there was one science there have sprung up many. Clinicians in the age following Harvey became largely absorbed in the description of disease; in the hands of men like Sydenham this fascinating branch of knowledge, derived from observation, rapidly expanded. Though prosecuted sporadically in this country among physicians, Harvey's method fell amongst them into relative disuse; until during the last century, being relegated, it was seized upon enthusiastically by a small band of devotees

and shortly became the basis of the present science of physiology. The budding off of physiology is almost within memory. The process of disruption has continued. First physiology abandoned medicine, and in going took largely from medicine its function of studying the normal processes of the body; it also took something more important, for clinical medicine seemed to relax its claim to the use of the experimental method, which it had forged and which physiology, its offspring, now chose as its own chief weapon. Pathology has budded or is budding off, assuming for its part the study of the mechanism of disease, human or otherwise, and in almost all its aspects. This disruption of medicine, as it was originally constituted and as Harvey knew it, may be the inevitable outcome of its growth, may profit physiology, may profit general pathology, may even profit the medical sciences when these are viewed as one whole; but it is a process which can be carried too far, and it then becomes, is becoming, detrimental to the development of the clinical branches of work.

It is necessary for medicine, still the parent and still largely possessed of guiding authority, to call a check to this subdivision of her estate. It is necessary that steps should be retraced and that territory originally possessed should firmly be reclaimed, so that medicine should not be narrowly confined; it is requisite that medicine should renew its strength to wield its chief weapon, the experimental method. It is to the accomplishment of these ends that the establishment of Clinical Science in its full scope is to be regarded as so important. But if this science is to become established it must not be formed into a third unit, which shall presently detach itself and move off to a position of isolation; it must remain firmly within and develop as an integral part of the whole organization. And to secure this most desirable and permanent unity it must establish itself, not in laboratories of our medical schools, but actually within our hospitals, centring upon the wards and out-patient department, and using laboratories merely as adjuncts and storehouses of necessary equipment. Above all, we must guard ourselves against the obsession, tending to grow up in recent years, that useful discoveries are purely the prerogative of laboratories.

THE GENERAL SCOPE OF CLINICAL SCIENCE

The proper practice of medicine has been built up, and continues to be built up, on a complex basis. The general mass of our knowledge rests upon a tripod, the three limbs of which are each essential to the stability of the superstructure; these limbs are:—studies of living men in health and disease; studies of dead men; and correlated studies undertaken upon the lower animals.

The full scope of Clinical Science, as the work of Harvey first defined it, embraces all these three. The central and unique studies of Clinical Science, most fundamental of all studies pertaining to the practice of medicine, are those which deal with living men. But these cannot be divorced either from anatomy or from experimental work on animals without embarrassing all three, and without seriously weakening the whole edifice.

It is quite necessary to the proper progress of the clinical branches of study that they should be most strongly linked with physiology, with morbid anatomy, and with what has been called experimental pathology. The linkage can be an enduring one only if Clinical Science continues to command opportunities of studying both dead bodies and living animals.

It is essential that those who have held charge of patients and have studied phenomena in the living should themselves, and not through skilled deputies, explore the tissue changes which may underlie disturbed function;

for while the skilled deputy may more accurately describe and name those changes in the tissues upon which he chances, he cannot enjoy either full opportunity or the full inspiration to correlate function and structure. It is by these correlations that the meanings of many manifestations during life are explained; it is by correlation rather than by simple study of the cadaver that the meaning of illness and the cause of death are often or usually to be explained.

It is essential that those who in studying human patients perceive opportunities of putting questions to the test of animal experimentation should themselves engage in such work; that correlation should not be left to the chance meeting and union of clinical and laboratory studies; that the spirit which moved the original inquiry should live, vitalizing and directing the whole work in its progress along a broad path towards a practical goal. To divide or attempt to divide medical research into ward research and laboratory research is narrow and mischievous; it is a profound error to believe that there is any essential difference in general method, however different may be the technique.

The physicians and surgeons of our great teaching hospitals become more and more dependent upon technical experts. How easy, as the problems suggest themselves at the bedside, to accept the view that it is fitting that these highly trained and fully equipped men should undertake the investigation. But the result, so often, is that from the first the research is forced into a narrow channel of technicality from which it fails to emerge, and the work ends in one of those reports which, scientific though they may be in their cold logic, unfold no story, and remain uninspiring and lifeless. The fascination and importance of the problem in its wider and practical implications have been concealed, the inspiration that should drive to its solution has been lost, because the problem is no longer seen in its full perspective, a problem primarily concerning the living, in part concerning the dead, and in part deriving from the laboratory. It is just this integration that is of so much consequence to the vitality of medical research; and this integration is, and always must remain, chiefly within the special province of Clinical Science. As there has been occasion to state previously,* knowledge that is applied usefully to the health of mankind will almost always come by a series of steps, the first of which is the recognition of the human need, the last of which is the application of a test directly to the human problem. It is therefore in the nature of things, however many steps may intervene, that the first and last shall be clinical. He who can see the source of the problem, who can appreciate the fittingness of its final solution, is uniquely fitted to guide the whole train of thought and of inquiry.

Harvey investigated the human body in health and disease, living and dead, and used animal experimentation to supplement his other studies. This is our birthright, derived from him, and we must not depute our proper tasks. A great need of the medical sciences in the present stage of their development and interrelation is a group of men, primarily clinicians, but fully accustomed by training and by daily experience to wrestle with scientific problems; men who, in place of relatively complete and accurate knowledge of some purely laboratory science, hold as the first part of their equipment intimate acquaintance with the relevant diseases as these are seen in living men, who have also acquired sufficient knowledge of related physiology and of general pathology, who have the aptitude to acquire quickly and well the necessary technical knowledge and skill, thus to enable them to grapple with the problem both in its detail and in its wide aspects, and to drive successfully to a practical goal.

But such work, it will be clear, requires not only ability, but it requires a man's full energy; it is not the type of work to which those busily engaged in practice can give themselves in leisure hours with full prospect of success. Physicians do not now live as Harvey did in times of easy clinical activity, but in days of much heavier and more complex routine. So if the purpose in mind is to be brought to accomplishment it will be necessary to set free men having aptitude for the work outlined, to form a phalanx of trained clinicians who shall bring Clinical Science to a new pitch of scientific efficiency and hold it there.

From this statement of the general scope of Clinical Science and its aspirations we pass on to survey, not exhaustively, but selectively, certain studies upon which Clinical Science may profitably engage.

DIRECTIONS OF INVESTIGATION

Studies of the Disease

Description and Definition of Disease.—Coming down to us in part from remote times, chiefly from the great clinicians of the seventeenth, and especially the eighteenth and nineteenth, centuries, is this tradition, the discovery of new disease, consisting of the separate description and naming of recognizable diseases. This recognition of separate diseases originally based itself upon close resemblance between manifestations of ill-health in separate people, with or without the additional evidence of a common morbid lesion. At first such discovery was a matter of relatively simple observation, as was the identification of biological species; but it would very naturally become less simple as those of most constant form were eliminated, and the number of those to be recognized consequently diminished. While requiring freshness of sight and mind, so that the opportunity might be seized when it occurred, nevertheless, progressive work of this kind has been and must continue to be a matter largely of good fortune, as when several patients of one type present themselves for examination in quick succession. To-day work along these lines could not be a planned investigation; it has become incidental to a long routine directed to other purposes. There may be many forms of disease yet to describe, but it is manifest that most diseases of simple types have been named; there is evidently work still to do in recognizing the less obvious types. Moreover, there is very important new work to do, if one may express the matter a little differently but more clearly, in *defining* conditions of disease. This defining, which is no more than accurate naming, is quite fundamental to many studies that must be undertaken in the future. The very attempt to define often fires a dormant spark of inquiry. This method of working towards precise definitions, and ultimately from them, is both instructive and prolific; it leads to the belief that diseases are named much too often upon a simple, and perhaps loose, grouping of symptoms, and that closer analysis of mechanism will lead in the future to much revision of terms. Definitions cannot be made satisfactorily in terms of grouped symptoms; definition brings us quickly to intimate questions of causation. When it comes ultimately, as it comes inevitably, to questions of causation, then it is found, as the history of medicine abundantly illustrates, that on the one hand distinct diseases have superficial resemblances, bringing them to be confused, and that on the other hand conditions thought to be quite unconnected have proved to have a common pathological basis. Instances of both kinds of reshuffling will no doubt often occur again. As our understanding of disease is incomplete, so, and in that measure, our classification remains artificial and lacking in finality. There are, in fact, few clear-cut discoveries

* *British Medical Journal*, December 10th, 1932.

relating to the mechanism of disease which have not called for some change of nomenclature; there are probably none that do not render close revision of parts of it advisable. While the progress of nomenclature directly and importantly affects investigation of mechanism, the latter often affects the former. There is an interplay between the two; they should move forward together; in investigation the nomenclature of disease, until based firmly on cause, should usually be regarded as unstable. Briefly, there are two points to realize. Firstly, that the useful nomenclature of disease is becoming less a matter of simple and casual observation, and more and more dependent upon a close understanding of the mechanism of disease, and therefore upon concentrated and intensive study. Secondly, that the attempt to reach accuracy of definition is itself a strong stimulus and powerful guide to investigational work.

Search for Cause.—There is no special method of investigating the cause of disease; knowledge of cause may be derived from one of many sources. The disease may prove to be hereditary; it may be acquired. The ultimate cause may become revealed after a characteristic group of symptoms is seen to be associated with some definite morbid change. It may be found to result from a specific bacterium or protozoon, from a fault in diet, from contagion, or from exposure to a poisonous environment. Causation has far more aspects than can be dealt with here. But one point of view peculiarly relevant to this discourse may be considered. Although it is manifest that the cause of disease may be found by bacteriological, protozoological, dietetic, or epidemiological study, it is also manifest that such studies depend for success upon relevant clinical discoveries. The cause of human disease never has been, and never can be, found purely within the walls of a laboratory; there must be at least some association, direct or indirect, with patients. This association has grown, especially in the case of bacteriology, to be too loose; it is quite necessary to the proper study of many diseases that the association should develop the intimacy which has proved so successful in investigation of tropical disease. Let us remember that Lister was his own bacteriologist. The solution is not usually to be found in what has been termed team work. Can it not be hoped that skilled clinicians will be found in this country who will devote their lives in studying the origin of disease, and who will fit themselves by special and appropriate training for this particular task; or is reliance still to be placed on casual contacts between pure clinicians and specialists in laboratory technique or pathological method?

Studying the Course of Disease.—Apart from those diseases which run short courses to death or to recovery, work of this kind can be undertaken satisfactorily only by those in long-continued contact with given patients; it is essentially work for the co-operation of the family doctor. Whether the course of the disease studied is modified by treatment or not, these investigations are fundamental to prognosis. Sound prognosis bases itself wholly and inevitably upon experience, a statement which needs emphasis. Much further information than we possess has still to be obtained, even in so far as relatively simple conditions of disease are concerned. Where close definition of disease is impossible, where in arriving at a prognosis several factors must be considered, the precise significance of the different factors has usually been insufficiently analysed. It is often work of a most tedious kind, and involves highly critical and sound statistical treatment. A most notable, I would say unique, example of such work is that carried out over a ten-year period upon 1,000 cases of chronic heart disease by Dr. Ronald Grant. His contribution will form the basis of sound prognosis in cases of this kind for very many

years to come; I point to it for this reason, but especially because it is an illustration of scientific method in establishing prognosis.

Therapeutics.—The basis of all new treatment is, and always will be, critical experiment. Therapeutics is a purely experimental science, and its methods should, but unhappily do not, always correspond. There are a few drugs such as thyroxine and insulin, mercury and iron, digitoxin and morphine, the beneficial effects of which, when given to appropriate patients, are so rapid and so obvious that they are universally acclaimed as sovereign remedies. For the rest, a large proportion of the drugs in daily use are without scientific sanction, and no attempt has been made or is being made to obtain this sanction for them. There are many forms of treatment—electrical, balneological, and I would also add surgical—to which the last statement equally applies. Let me not be misunderstood. I do not mean that they are unsupported by a train of academic reasoning. There is in my view only one good reason why a remedy should continue to be used—namely, that it has been found to be of service; this standpoint is empirical, but that does not prevent it being fully scientific. Neither do I mean, in saying that many remedies are without scientific sanction, that they are useless, but that there is no properly recorded evidence of their usefulness. One of the more obvious tasks of clinical science is to compile clean and readily available records of properly controlled observations proving the effects of such remedies. It seems unbelievable that the profession can long continue tolerant of a system under which drugs and other remedial measures are vaunted on an inadequate basis of recorded experience, or that doctors should be almost forced by popular clamour to give and to transfer allegiance, an allegiance stimulated by report or advertisement and not by proved worth, temporarily to this remedy or to that. It is not through easy, but often fallacious, general impressions that full progress is to be expected, but mainly through deliberate, unbiased, and untiring study of the reactions of patients to given remedies. It is the duty of clinical science, in this branch of its activity, to maintain close linkage with pharmacology; but it is equally its duty clearly to recognize that, in so far as both manner and intensity are concerned, the action of a drug on man is not necessarily the same as the action on an animal, and that the action on the diseased is not necessarily the same as on the healthy man. The proof or disproof of a drug's efficacy rests finally on the test in patients.

We have been dealing with methods in which the disease itself is the focal point of study; the isolation and recognition of entities, the inquiry into the cause, course, and treatment of disease. There are other important forms of investigation.

Study of Special Manifestations of Disease

A very profitable line of study is that which inquires into separate but various manifestations of disease, whether these are subjective or objective.

The study of subjective symptoms has a unique practical value in that it relates to manifestations directly affecting the patient's welfare; these manifestations of ill-health must be dealt with whether we know the cause of the disease producing them or not. But the study of subjective symptoms and other phenomena has a much wider importance, because it frequently throws a flood of light upon the processes and nature of disease, leading up to closer definition and to more intimate understanding. It was inquiry into the meaning of the symptom "palpitation" and to a closely related phenomenon common to many different diseases—namely, irregular heart action—which led to the volume of productive work upon the mechanism of the heart beat. And it is to be particularly

emphasized that that work comprised not only studies of the disordered heart beat, but of the normal heart beat as well. Since symptoms, using the word in its broad sense, may usually be regarded in terms of disturbed function, the study of symptoms necessitates very close consideration of the relevant mechanism of the body while this is working naturally. The study of symptoms, therefore, is the branch of Clinical Science which links it most closely with physiology and stimulates physiology to many of its most important new ventures. For the study of symptoms, when productive, always expands the corresponding branch of physiology. It is a notable fact that, in beginning to study a symptom, physiological information sufficiently complete to form a proper basis for the analysis of that symptom is very rarely available; often it is extraordinarily meagre. It must be sought in part or in whole before the symptoms can be studied. These preliminary studies fall usually to the clinician himself, for he alone is likely to realize the precise information required and also the importance of acquiring it. No one can work rationally upon the mechanism of symptoms who is not primarily a clinician, and who does not become in his chosen field a physiologist also. There is no branch of medicine, if we class disease anatomically, which does not profusely illustrate this fact. The work of neurologists and their fundamental contributions to our knowledge of the normal function of the central nervous system is no isolated instance, but it will spring at once to the minds of all.

Transient Phenomena.—It is frequent for a patient to complain of some symptom, or for some phenomenon to be observed in him, that is not continuous, but transient. Such phenomena cannot be studied too closely; they are most instructive and their investigation most fruitful. The transient phenomenon may consist originally of some relatively simple change, followed, maybe, by profound secondary disturbances. A very notable example of this kind is the paroxysm of tachycardia, a sudden increase in the rate of the heart beat to perhaps double, or more than double, its original level. These paroxysms come and go, and they allow us to study to perfection the effects of change in the rate of its beating upon the heart, normal or afflicted by disease. It is almost as though we were able to turn a rapid series of rhythmic shocks suddenly into the auricle and to study the result at will; but it is actually done for us in the unanaesthetized subject, and without disturbance of chest wall or other structure. Sometimes the effects are profound. Within a brief period of the onset the subject presents the full signs of heart failure with congestion; a few hours later he presents none, the heart often returning at once to its normal size. In such cases the unique and recurring opportunity is presented of studying in its many aspects the manner in which heart failure develops. It is perhaps the most important experiment upon the heart which nature repeats before our eyes. You may study heart failure by comparing normal subjects with those who show failure. It is not the same thing; it is the chance of minutely comparing the normal and abnormal states of circulation *in one and the same subject* that is so important: here is the perfect control. You compare the one and the other state within a short time period; you can repeat and check your observations or modify your method of observation.

Provocation of Symptoms.—Symptoms are often transient, occurring under particular conditions that are related by the patient. From the standpoint of investigation it does not suffice to accept these statements; the patients should come under observation while the symptom is being provoked. In instances where the symptom is transient and oft recurring it is justifiable to ask the subject of it to undertake such an act as ordinarily

provokes the symptom; but when this is done it must be under carefully controlled conditions, with a view to discovering any phenomena that are simultaneously displayed by the patient, and how these associated manifestations and the symptom itself are changed by varying the conditions of observation. There could be no better illustration of this highly valuable method of clinical work than recent observations upon intermittent claudication and angina pectoris. The two conditions have a closely allied pathology. For nearly a century and a half attacks of angina have been recorded; but it is only recently that we are really beginning to understand them. And this understanding comes from careful study of actual changes of pulse rate and blood pressure occurring during the attacks, and from studying by controlling them the factors involved in producing the attack, and correlating these with the corresponding observations on claudication. Many recent instances of productive work of this kind, enjoying as it does the full advantages of the experimental method, might be cited. It promises to develop into a fertile branch of Clinical Science; for while bringing us into much closer contact with disturbed mechanisms, it has the power to unveil essential factors relating to the cause of the disease studied.

Systematic Observation.—This very important method of work has still a great future. In its simplest form it investigates all the circumstances in which a given phenomenon appears, and endeavours to find an invariable correlating factor. In the case of a symptom, such as headache, it leads to clearer definition of the immediate cause of that symptom. In other instances it displays unmistakably the effects of a manifestation, such as high blood pressure, common to several diseases. It may also teach how a given phenomenon is affected when circumstances vary spontaneously, then acquiring much of the power of the experimental method.

The Appeal to Lower Animals

In a brief survey it is unnecessary to do more than touch upon the obvious opportunities presented by studying the effects of simple injuries, especially of wounds. The historical example of the wound in St. Martin's stomach of which Surgeon Beaumont brilliantly took advantage is a sufficient illustration of its fertility. In the same connexion may be mentioned the equally fertile opportunities provided by studying the effects of certain surgical interventions, as in the well-known instance of the thyroid gland. I will not dwell upon the special opportunities for observation that present themselves to surgeons during the progress of operations; such investigations as those concerning referred pain largely depend on this method, which, however, must remain purely incidental, and must always be conducted within strictly prudent bounds. Deliberate interference, other than trivial interference or interference undertaken wholly in the interest of the patient, is not to be considered. It is for this reason of humanity that we appeal to the lower animals, and on this question there is still something to be said.

The use of animals for experiment is the chief, and rightly the most valued, method of the physiologist; it is equally indispensable to several branches of pathology and to pharmacology. But here the use of animals will be discussed from a very limited point of view—namely, its direct application to Clinical Science. A method of studying human disease, advocated since Claude Bernard's time, is first to reproduce such disease in a lower animal, and then to proceed to investigate it in that animal. In theory ideal, in practice this is rarely possible of full accomplishment. Strictly speaking you cannot by cutting or tying operations reproduce any human disease other than one arising out of injury. It is possible to produce

disease closely akin to that seen in man by introducing into animals the original agent of the human disease, bacterial or otherwise, or by withdrawing some essential from the diet; but, because the animal and its reactions are different, the disease is not accurately reproduced. The great value of animal experimentation in Clinical Science—putting on one side the indirect and great contributions of physiological experimentation—lies in a different direction. Disease destroys certain organs or interferes with the functions of certain structures, giving rise to specific manifestations; these *manifestations* of disease may often be reproduced in animals. If we can be sure of accurate reproduction then their meaning and consequences in man may often be elucidated by further study. If by some interference we can occasion high blood pressure in a dog, we have not reproduced the disease “essential hypertension,” and there may be no justification for supposing that the two states have anything in common beyond high pressure; we can learn much, however, of the effects of high blood pressure by this method. To entertain the belief that disease has been reproduced because one of its manifestations has been caused to appear is to fall into an easy but serious fallacy. A little thought will show the full significance of this statement and will bring the supreme importance of clinical research fully into view. When we investigate clinically some disease, or some manifestation of it, we may be seriously handicapped by circumstance; but we are possessed of the certain knowledge that what we study is precisely what we set out to study. That is a tremendous asset. The complete assurance is never enjoyed in studying an artificial phenomenon.

STATUS OF CLINICAL SCIENCE

Clinical Science should lead the medical sciences of the future as it led in the past. It can do so by waking to full consciousness of its powers and responsibilities. There are many directions in which physiology and animal pathology are fundamental to the study of human pathology; Clinical Science, which includes human pathology, is fundamental to the proper pursuit of the healing arts. In this direction it has direct powers of which the remaining medical sciences very rarely become possessed. Because of its immediate and constant bearings upon the health of the people it is the most responsible medical science. But it will be clear that if it is to take its rightful place in our community, then it must acquire full opportunities, so that it may be conducted, as are the other sciences, with the freedom of movement essential to vitality, being unhampered by collateral preoccupations and opportunisms. It must be conducted with that rigid adherence to truth that takes no heed of consequences. It must seek knowledge for its own sake, and be allowed to develop its own lines of progress. It must be judged, and its devotees must be rewarded, upon a new basis—namely, the weight of contribution to actual knowledge and to philosophic thought, without reference to the immediate practical result. This high status cannot be won for Clinical Science by the efforts of practising physicians and surgeons, however brilliant and unselfish their efforts may be; for these can be no more than occasional acts intermingled with very different activities, and the movement to be successful calls for concentrated purpose and sustained work over periods of many years. I am profoundly convinced that a movement such as is outlined is essential to the future safety of medical science, and am equally convinced that it can be accomplished without unusual difficulty by young and able men who can see the opportunities presented to their generation and are prepared to give themselves whole-heartedly to the fulfilment of this great purpose.

Briefly, Clinical Science to develop fully must become possessed of the traditional intellectual liberty of other sciences. It requires only that the simplicity and truthfulness of this ideal should be understood and its implications realized for Clinical Science to come soon into its own. Appointments to full-time service in medicine must be based neither on professional experience, nor upon capacity in teaching, nor upon simple erudition, but primarily upon distinction in the organization and accomplishment of work in Clinical Science. The focus of academic medicine must not be allowed to become the teaching of masses of students for professional objects; the focus must be the fostering of pure learning; and the main work of the day must consist of search and research, of the sifting of sound views from unsound views, of an impartial weighing and recording of evidence. Academic medicine must not be driven to a merely technical end-point, but must assume the full dignities and responsibilities that belong to a great and progressive branch of knowledge.

There are questions which concern the elucidation of disease and its processes in man which are among the hardest that human intelligence and endeavour have to answer. Clinical Science especially requires, for the solution of its many and varied problems, men of first-rate ability. To the younger generation the opportunities now offering, the security that is assured, are of a kind undreamt of a few years ago. The days are passing when a worker was inevitably forced away from the work of his choice to find his livelihood in practice. The time is approaching very nearly to us when it will be impossible for men spending long years in the successful solution of problems in Clinical Science to fail to draw around them at least a few eager young workers from their own teaching institutions; when it will be impossible for them to remain isolated intellectually, and surrounded only by students preoccupied by more directly practical pursuits and interests.

Here and earlier it has been urged that the work of Clinical Science requires for its highest development men who devote their thoughts and labours to the investigation of human disease as a life-work. To bring into existence a group of such workers is the need, and in my view the opportunity, of to-day. But while impelled at the moment to this advocacy, I am not unmindful of the great work of practising physicians and surgeons in the past, or of the contributions of young able men whose ultimate destination is practice. Upon such work the growth of Clinical Science has till now depended and must continue largely to depend. The contention is that such work is not by itself adequate to keep Clinical Science abreast in the team of allied medical sciences.

THE RECENT GROWTH OF OPPORTUNITY

Medicine, like the world generally, is passing through times of change, of critical readjustment to the spirit of our age. In the days before the war no man could pursue Clinical Science as his sole aim and live. There were a very few scholarships to help an occasional student to linger for a few years, but no more, before taking the plunge into practice. There were a very few sources from which small grants might be obtained to cover barely, or in part, expenses incurred in work. The first sign of real change came from a generous and far-seeing private donor, Sir Otto Beit, who in the year 1909 endowed a Trust of nearly a quarter of a million pounds for the maintenance of a large group of three-year Fellowships. The Fellows first appointed had barely completed their term of work when the movement for the encouragement of research in medicine became greatly enhanced by the allotment of public funds under the control of the

Medical Research Committee (now the Medical Research Council). This council has the power, and has repeatedly stated its eagerness, to establish units of clinical research in this country, paying adequate salaries and defraying all reasonable expenses. Since its inauguration it has gladly welcomed the chance to finance all reasonably promising schemes of clinical research submitted to it. Its influence upon medicine in this country has been an ever-growing one, not only because of the increasing importance and volume of the work done under its guidance, not only because its resources, financial and otherwise, have increased, but for a further reason which is perhaps the most important of all. Within a short time of its institution, and remarkably, it established in the minds of those working under it a feeling of security that they were free to pursue their work without other cares. Workers under this council have enjoyed an unusual measure of freedom from direction and from restraint, and a sense that both their present and their future interests are closely guarded for them. When the war was over the educational authorities began to take a part in this progressive movement, and there became established in London alone a number of professorial chairs in medicine, surgery, and gynaecology, with establishments that now provide full-time work for a much larger number of junior workers. Other benefactors have begun to found additional senior posts specifically intended for the prosecution of research in Clinical Science within the wards and laboratories of hospitals. One of the first of these was the permanent endowment by the Rockefeller Foundation of such a post at University College Hospital. It is being followed by the creation of a similar post by the Beit Memorial Trust. The Medical Research Council has established a neurological unit of a similar kind at the National Hospital, Queen Square. I would ask you not to forget that two Foulerton professorships have been established by the Royal Society in recent years, under a bequest "for original research in medicine for the discovery of disease, the causes of it, and the relief therefrom of human suffering," stipulations which clearly open these posts to purely clinical candidates, possessing appropriate qualities. The instances given are by no means exhaustive; but enough has been said to show how profoundly the position has changed within the space of a few years and how rapidly the movement is gathering force. It is most encouraging to see this College possessed of its own special research funds for the direct help of progressive work. The formation of a Science Committee within this College is another and important sign of a general trend of events and of the awareness of the College of the spirit of these times. Apart from their potential importance such innovations can hardly fail to form important and necessary links between the more purely academic and the practical activities of our profession. It would be gratuitous for me, in speaking before this College, to dwell upon the importance of such linkage. Every pathway between those who have new knowledge to impart and those who can apply it must be maintained; and though it is necessary that investigators should enjoy that measure of seclusion which is necessary to the full development of their powers, it is vital to our profession that there should be no sharp distinctions, no subdivisions into a camp of investigators and a camp of doctors.

But of all the developments happening in recent times none is so important as the lively awakening and steadily growing interest among young and able men in the clinical field. This change in spirit and in intention has now been in progress for a sufficient time for us to be assured that it is not transient, but has behind it a fixed and deep enthusiasm based on gathered courage and confidence, which now can hardly fail to carry the movement

forward to ultimate success. The activity and fruitful work of many new recruits has enabled the formation of a new society, now in the fourth year of its vigorous growth. The gatherings of the society, formed around a nucleus of full-time workers, but closely linked with the practising profession, are already notable for the original quality of the communications which it welcomes and informally but thoroughly discusses. Simultaneously, among those men, and they are now many, who are steadily pressing this movement forward, there has developed a spirit of mutual interest, help, and encouragement, founded upon a common purpose in work; there has come to clinical workers in the great schools a far closer community of feeling and of sympathy, not only with each other, but with workers in physiological, pathological, and other fields of scientific endeavour, connecting links of the utmost promise for the future. Clinical workers are beginning to acquire their share of that subtle atmosphere which is common to university life, and is well recognized to exercise profound influences upon the spirit and method of work and of thought.

CONCLUDING REMARKS

A little more than three hundred years ago the clinician Harvey, inspired by the desire to understand the motion of the heart, set himself to discover its meaning. He did not concentrate upon such of its motions as he might see in his patients; but starting from these, in his wisdom, let his gaze roam. He searched widely, gathering with his own hands and with his own brain all such information as he might find pertinent to the furtherance of his studies. It was because he possessed breadth of vision that he brought these studies to a conclusion that has proved fundamental to all medical science. In doing so he gave us an exposition of method of unique force and significance. He established for us a tradition, a tradition that Clinical Science shall not be confined narrowly or by artificial boundaries, but shall be free to search how and where it will: a tradition which will not countenance attempts to separate the study of health from that of disease, or the study of animals from that of man, or work at the bedside from that of laboratories. These are among the lessons of *De Motu Cordis*, and this is Harvey's leadership. As your chosen Orator to his memory to-day I recall to you as Fellows and Members of this College his exhortation to search and study out the secrets of nature by way of experiment. I am moved to ask here and in his name that this College should allow its gaze to rest with earnest pride on this gift of Harvey's, the Clinical Science which he founded; that, visualizing the special needs of this science under the strain of modern conditions, the College may offer full encouragement and sympathy to its appropriate development: I ask that it should couple Harvey's name particularly with this science so that it may stand to him in this College for his most lasting monument, and that it may form a bond within this College between those who live to gather knowledge and those who live to apply it to the needs of the sick, a bond bringing mutual affection and respect.

To you, Mr. President, I desire to express my humble thanks that you have afforded me opportunity of promulgating these ideas, at this time, in this place, and on this occasion. For in respect of time, the signs of its ripeness are abundant; in respect of place, this great College has for centuries formed a chief centre, not only within Great Britain, but in the world at large, of progressive clinical thought; and in respect of occasion, we are here to offer tribute to the most illustrious son of this house, to him who gave us his noble example of the Science of a Clinician.