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MEDICINE IN THE FRAMEWORK OF THE UNIVERSITY*

BY

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It is not for me, a stranger in this city and university, to tell you, who all know it, the full story of Arthur Hall's part in the development of your medical school and its embodiment in the university as a faculty of medicine. I believe it is a story without parallel in our time in the creating of a university school of medicine, and we surely may not let this occasion pass without giving at least the bare bones of what this remarkable man undertook and accomplished in connexion with it.

Hall's Versatility

Shortly after his appointment to the staff of the Sheffield Royal Hospital, and in addition to his clinical responsibilities, he became in succession demonstrator, lecturer, and then professor of physiology. He took the initiative in securing for the school the whole-time services as an anatomist of Christopher (later Lord) Addison. He then handed over the professorship of physiology to a whole-time professor and turned to the founding of a department of pathology, initiating a pathological museum and filling the role of professor of pathology, until, the time being ripe, he yielded this role also to a whole-time professor. Finally, in 1915 he put the capstone upon this versatile *curriculum vitae* by becoming your first university professor of medicine.

These are but the high-lights of years spent in the devoted and sagacious service of your school and university, and the creative role he played in so many vital departments suggests that the spirit that has given birth to the phenomenon of "working to rule" had not been thought of, or, at least, had made no appeal to Arthur Hall; a man urged onwards by altruistic motives.

This story has been more fully and better told by his colleague Dr. Gurney Yates and by Dr. Chapman in his history of the university, and, to my mind, not the least impressive element in it is that a man of such administrative gifts and constructive mind should have preserved as his first love the active practice and teaching of his profession of medicine and the pursuit of knowledge within it. It is not always so, for administration and the entry into the world of public affairs to which it may so easily lead seem to offer what for some are more attractive prizes and a wider field of action than does constancy to the vocation of medicine.

Yet Arthur Hall remained for all his working life a physician first, and it was to this end and that it might be possible for others in his native city to do likewise that he used his great administrative gifts, and who shall doubt that he chose therein the better part?

So it happened that, when at the end of the first world war the mysterious disease epidemic encephalitis appeared in this country and fell upon this city, he was fully prepared for the occasion, and made a deep and extensive study of the disease, embodying his observations and conclusions in a monograph that is a model of its kind and remains as a classic account of its subject. Nor was this by any means his only original contribution to medical knowledge.

It is not surprising, therefore, that you should wish to commemorate this good and gifted man who over a long life remained faithful to his city, to its university, and to his profession. A city does not command an allegiance of this order from its most distinguished sons without deserving it, and perhaps the occasion is a fitting one on which to salute those amongst Arthur Hall's collaborators in this great work who may be here with us, and whose names and deeds are known to you, and to recall those two most loyal collaborators, Christopher Addison and J. B. Leathes.

A Great Achievement

The theme I wish to put before you is one from which, perhaps, a more modest man might have refrained, yet it is one naturally suggested by the occasion of this lecture and by the achievements of the man whom it commemorates, for the elevation of the Sheffield Medical School into the Medical Faculty of your university was amongst the greatest of the achievements in which Arthur Hall was a leader, and to one which, I surmise, may have given him his deepest satisfaction.

From the Middle Ages onwards, medicine has been nourished in the bosom of the university, and indeed, historically, there is no older university faculty than that of medicine. If we were to name Salerno as the first of the universities in Europe, then medicine would be the oldest faculty, but if we take Bologna, Padua, and Montpellier as the forerunners of the university in Europe, then medicine and law stand as the two original faculties.

My theme, then, is that medicine owes a great debt to its age-old association with the university, and that there are in medicine, largely conceived, ethical and humanist elements that should enable it to repay some of this debt to the university of to-day which gradually, but progressively, seems

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to me to be approaching ever more closely to the idea of the polytechnic, and to be developing an intellectual climate not wholly favourable to that generality of understanding that is the essence of a civilized culture.

I should therefore like to convey to you a sense of the debt of medicine, first to the mediaeval university, and then to the post-Renaissance university of the seventeenth and later centuries.

That modern thought owes anything significant to the Middle Ages is an idea not now widely favoured, and medicine and physical science commonly are said to date their rise from the change in human thought and outlook that spread from Italy at the time of the fifteenth century Renaissance.

An Untrue Picture

The picture we commonly receive of medicine in the Middle Ages is that of a subject struggling vainly to be free from the bonds of Galen's thousand-year-old teaching, from the restrictions of the Church, and from the scholastic disputations that frittered away the intellectual energies of the mediaeval university.

I believe that this notion is wanting in historical sense and does grave injustice to the Middle Ages, and, like so many ideas that are taken for granted, needs reconsideration.

Yet it is very widespread and finds expression even in Sir Charles Sherrington's life of Jean Fernel, the sixteenth-century Paris physician. Sherrington was the most fair-minded of men, yet he seems to dismiss the liberal arts, that were the basis of the mediaeval undergraduate's training and the necessary foundation of orderly thinking, as "mere lessons in memorizing maxims for divinity." Yet, even so, he did not claim that the arrival of humanism with the Renaissance was the signal for any immediate efflorescence of intellectual activity in medicine, for he admits that the Italian renaissance "changed a number of things, but brought no change to the *a priori* doctrine or outlook of medicine. . . . The renaissance with all its social enlightenment," he goes on to say, "bowed its head under pestilence and fever with hardly further protest than a prayer," and, again, "the renaissance round Fernel troubled little about this. Intellectually its interest did not lie in probing uncertainties about nature."

There was in fact more than a century-long lag between the heyday of the renaissance and the birth of the possibility of modern medicine and of physical science in the seventeenth century.

The reason for this long pause is indicated by Sherrington himself in the 'Life' to which I have referred. He says, "Essential to a great discoverer in any field of nature is an intuitive flair for raising the right question. . . . To ask something which the time is not yet ripe to answer is of small avail. There must be some means for the reply and enough collateral knowledge to make the answer worth while."

This assumes the coincidence in time of the man, the adequate intellectual method, and the keen interest in nature for its own sake. For medicine the man was William Harvey, the time the opening of the seventeenth century—the century of geniuses in science—the intellectual method derived from the Middle Ages, and the interest in nature for its own sake from the Renaissance. All these together first made possible the growth of medical science. One item remains to be added to this list—namely, the practical method, in this case that of direct and experimental observation. But these were known and had been lying unused for a thousand years since Galen's time. It was Harvey's signal merit to have resumed them.

Our Debt to the Middle Ages

In short, each epoch in history has its own contribution to make, and, so judged, the contribution of the university

in the Middle Ages is seen to have been a necessary step in the evolution of medicine and of science in general, and to have been of a nature characteristic of its time. I shall speak of this contribution as the intellectual method, and my reasons for doing so are perhaps best expressed in the words of a great modern mathematician and philosopher, Alfred North Whitehead (1926). This is what he says of our debt to the Middle Ages:

"The Middle Ages formed one long training of the intellect of Western Europe in the sense of order. There may have been some deficiency in respect of practice, but the idea never for a moment lost its grip. It was pre-eminently an epoch of orderly thought, rational through and through . . . the habit of definite exact thought was implanted in the European mind by the long dominance of scholastic logic and scholastic divinity. The habit remained after the philosophy had been repudiated.

"I do not think that I have even yet brought out the greatest contribution of mediaevalism to the formation of the scientific movement. I mean the inexpugnable belief that every detailed occurrence can be correlated with its antecedents in a perfectly definite manner, exemplifying general principles. Without this belief the incredible labours of scientists would be without hope. . . . Faith in the possibility of science . . . is an unconscious derivative of mediaeval theology."

How was this sense of order and the habit of orderly thought imparted to the medical student of the mediaeval university? By his training in the so-called liberal arts, in particular the three arts of the Trivium—grammar, rhetoric, and logic; and this reminds us that the student was already a Master of Arts before he entered upon the study of medicine.

It is by the use of these arts that the unordered phenomena of our observation at the bedside or in the laboratory are transmuted into ordered knowledge. First, the facts are recorded in a precise language, the grammar of medicine: that is, they are translated into a grammatical construction that now comes to stand for phenomena, in this they are classified and grouped into patterns and sequences. Thus grouped, they can be considered from different aspects—that is, in terms of language, they are rhetorically expanded and dealt with by analogy, and finally logically interpreted so that rational conclusions may be drawn from them. In the simplest terms, the liberal arts enable us to handle phenomena, to classify them, to contrast and to compare them, to discuss them from every aspect, and to formulate them as exemplifications of general principles.

The intellectual weapons essential to this task, which is the task of every scientific observer, were forged for us in the mediaeval university. To-day every first-rate written record of a contribution to original knowledge demands and exemplifies the adequate use of the liberal arts, and every slovenly paper in which the facts are chaotically recorded, or classified, or their significance illogically interpreted, or missed, is an example of our too-common weakness in the use of these arts.

Growth of Interest in Natural Phenomena

Yet the capacity for ordered thinking and expression we inherit from the mediaeval university was not of itself enough to initiate the development of observational science. This required, as we have seen, the growth of an eager interest in natural phenomena for their own sakes. This interest had its earliest manifestations in the late Middle Ages in the realm of sculpture and illuminated books: for example, in the free carvings of natural objects in the Gothic, such as we see in the lovely carvings in the chapter house of Southwell Minster and in other great Gothic churches all over Western Europe and on the misericords which adorn their choirs. With the Renaissance this interest deepened and widened, and in due time—namely, in the seventeenth century—it first became systematically devoted to the study of nature.

William Harvey stands as the classic figure for us in medicine in this movement. Scientific medicine had become possible, but to this possibility both the Middle Ages and the Renaissance had made their different but necessary contributions.

This brings me to Harvey's significant and explicit claim in his immortal work, *De Motu Cordis*—namely, that he had shown "by reason and experiment" the role of the heart in the circulation of the blood. These two elements symbolize, I suggest, the particular contributions, of the Middle Ages and the Renaissance respectively, to his achievement.

In one of his well-known addresses, Wilfred Trotter, that sage, philosopher, and surgeon, discussed the relative roles of reason and observation in medicine, and stressed the necessity of a due mixture of both and the evils of either when not balanced by its natural complement. To-day, perhaps, observation is in the saddle, but not always with both its feet in the stirrups of reason, and the frequent and misguided reiteration of John Hunter's famous question to the young Jenner, "Why think, why not try the experiment?" that we encounter in Hunterian addresses and articles on medical history, has become a foolish and tiresome cliché. We cannot think that Hunter wished to imply an antithesis between these two activities, yet some of the platitudinous quoters of his historic remark write as though they believed that to make an experiment would relieve Jenner from the obligation of thinking: from the iron necessity of sound intellectual method. Perhaps Harvey's brief comment upon his own labours, that they were the fruit of "reason and experiment," though now forgotten by us, was an aphorism far better worth preserving. The curious will note which of these pronouncements came from the physician and which from the surgeon, recalling that the latter did not enjoy for some centuries that close relation with the university which from the beginning was the advantage of the physician.

I trust I may be pardoned this momentary lapse from the gravity of my theme.

I have been careful to say that Harvey's discovery of the circulation of the blood was not the birth of scientific medicine, but the birth of the possibility of this. A very long gestation was to follow Harvey's resumption of the experimental method before a medicine or a surgery that we can look back upon without horror came to birth. For example, during the rest of Harvey's own century, the highly organized activity of witch-hunting and witch-burning represented the psychiatry and the geriatrics of the age, while surgery remained a fearful lottery until a hundred years ago. Although Harvey's older contemporary, Francis Bacon, had delivered himself of the aphorism that the whole art of medicine is in making observations (*ars medica tota in observationibus*), clinical examination as we now understand it had to wait until the stimulus provided by Laennec's discovery and use of the stethoscope in the opening years of the nineteenth century; that is, for two hundred years.

We must be realists, therefore, and recognize that the growth of medicine, and of the biological sciences in general, was painfully slow and did not compare with the remarkable efflorescence of the mathematical and physical sciences in the years following the Renaissance. This slow progress is mirrored in Dr. Maurice Davidson's admirable history of the school of medicine at Oxford.

Looking, then, over the centuries from the seventeenth back to the thirteenth, we see the paradox that, while the earlier centuries forged in the mediaeval university the intellectual weapons necessary to the refining and ordering of knowledge, yet the prevailing thought of the Middle Ages that truth could be arrived at by a metaphysical analysis of the nature of things in effect prevented the study of nature, and it needed the sixteenth-century revolt from this philosophy for the method to be available for adaptation to the experimental method with its corollary of inductive reasoning. Yet the intellectual method was, and remains, essential to scientific thinking.

Ancestry of the Natural Sciences

It was during these centuries that the seeds of the natural sciences were wafted from the ancestral soil of the medical faculty of the mediaeval university to take root in alien soil and to be cultivated in separate laboratories. Many of our current terms indicate this ancestry of the natural sciences: for instance, the modern word "physics" derives from "physic," the ancient name of medicine (Scott Buchanan, 1938).

This is how we come to claim that medicine was the mother and the nurse of science, and to remember the prestige which the faculty of medicine enjoyed in the universities of the past. Yet we have also to admit that the university background of medicine kept alive the intellectual tradition, and tended to prevent its debasement by the technical arts.

Perhaps to-day the faculty of medicine does not hold quite the pride of place it once did. Her daughter sciences may seem to have out-stripped her and she is no longer a mother science.

Indeed, we hear it argued that medicine is predominantly a matter of empirical procedures and arts, with a vast and increasing borrowing and application of other sciences. This matter of the structure of medicine amongst the sciences I have sought to clarify elsewhere, and I will not go over the ground again, but draw your attention to another aspect of medicine—the unchanging face of medicine—which gives it a lustre and a virtue transcending those of all the natural sciences.

Practical Wisdom

If I dare quote Aristotle's *Ethics*, and yet be deemed to be talking seriously to a modern audience—an achievement not always possible in the world of medicine, alas!—I would remind you that over two thousand years ago he pointed out that science deals with universals and things that are of necessity, but not with the particular or with the affairs of men. It is prudence, or, as it has been translated, practical wisdom, that deals with these; and prudence, Aristotle tells us, is neither science nor art, but a virtue of the soul.

I hope I am not being obscure when I introduce the notion of the virtue of prudence, which I shall henceforth call practical wisdom, for it must be clear to anyone who considers the role of the doctor that ultimately he applies both his art and his science to the individual human person to the end that he may achieve the greatest good of that person. This is something over and above the pursuit and application of science, for practical wisdom implies not only the fruit of experience but also the ethical element that enters inescapably into the practice of medicine.

The physical scientist who designs a weapon of war, or the propellant or explosive that its employment requires, does not hold himself in any degree responsible for the proper tactical use of the weapon in the changing circumstances of warfare, nor as having any ethical responsibility for its use or for the consequences of this.

The only ethical demand upon the scientist *qua* scientist is that of intellectual integrity in his work, and practical wisdom is no essential element in this. Indeed, if he be an experimental scientist, he so devises his experiment as to leave the least possible role for judgment, intuition, or practical wisdom. In fact, the more exact a science, the less experience and practical wisdom it demands. The Greeks held that mathematics should be taught first and before natural philosophy, for the precise reason that it demanded no experience.

Medicine, on the other hand, is a compound of applied science and practical arts, making large demands upon these human faculties that the good experiment seeks to exclude, and in addition is governed by the requirements of practical wisdom with its ethical content.

Here is an aspect of medicine that does not wholly derive from the university, but from the very origins of medicine,

where we find it embodied in the Hippocratic Oath—the first professional code of ethics in history. Nevertheless, the spirit of the oath still continues to inform the training of the doctor, perhaps by example more than by explicit precept, and in the final clinical years of this training rather than in the preclinical years, and there are still some universities where some form of the oath is administered to the new medical graduate.

We find, then, that the role of the university faculty of medicine is the maintenance and the inculcation of a discipline which, over and above its strictly intellectual content and its special methods, seeks to fit its disciples in the exercise of practical wisdom as an integral element in their future activities and ways of thought—that is, in the ethical sanction which requires that they should seek the greatest good of their patients, and in the application of general principles to particular cases.

Medicine has a changing and an unchanging face: prudence in its practice is its unchanging face, and thus this dual nature of the role of the medical faculty makes it unique amongst the faculties.

The suggestion that all that this implies can be imparted to the medical student may be regarded as fanciful to the point of absurdity. It is of course true that you cannot teach wisdom by a series of lectures, not even if it be that panacea a course in psychology; but since it is one of the functions of a medical school to set an example of practice, I do believe that the student can by example be introduced to the spirit of the Hippocratic Oath, and by both example and precept led to understand those particular aptitudes and exercises of judgment vital to the practice of medicine, and without which, with all the information in the world, he may still go astray.

If, then, I am right in thinking that medicine, viewed as a whole, has in it these elements of science, art, humanism, and practical wisdom, where better than in a university faculty can it be duly and worthily fostered?

The ideal may seem unattainable in some circumstances: either because no one can be induced to hold it with conviction, or because in so large a centre of medical education as London, for example, with its dozen or more of separate medical schools, the university can mean no more than a remote examining and administrative body: creating no corporate sense, and stirring no man's pulse the faster, unless he be moved by the merely gigantic.

Concept of a Medical Faculty

But how different it can be in such a university as yours, where the sense of corporate unity and pride is so easy to develop and to maintain, where relatively few teachers can leave the whole and create the atmosphere of a faculty where the science and art of medicine are given their proper place in the larger framework of medicine as I have tried to picture it. I dare to hope that you may not find it unfitting, upon this occasion of our paying homage to the memory and the achievement of Arthur Hall, that such a concept of a medical faculty should be reformulated, for what other or lesser concept can have moved him to the labours out of which your medical faculty was born?

It is surely possible, without the paraphernalia of special lectures, to give the student upon his entry into the faculty some sketch of the many and different elements out of which has grown the ancient discipline to which, in its modern form, he is about to submit himself: some glimpse of the total pattern of his activities and their end, so that his mind is formed to medicine as early as possible.

And if the dimensions and geographical unity of the faculty make such a design possible, it is furthered yet more by the wisdom with which, in my humble submission, you have in this university filled your chairs of anatomy and physiology with medical graduates, rather than by non-medical specialists in some particular field of these sciences.

Whatever their distinction as researchers and teachers, the latter cannot really have any insight into or feeling for those supra- and non-scientific modes of thought and action that go to the making of the good doctor, nor take their due share in the formation of the student's mind. Some may say that to do this is not the role of the preclinical teachers. Yet, if the education of the doctor is to be a coherent sequence of studies leading to an end, it must be the role of all his teachers to contemplate this end, and this involves something more than the necessary attempt to make anatomy and physiology seem relevant to clinical science: an attempt which, it is only fair to admit, most preclinical professors now already make.

What I am leading up to is that a university faculty of medicine, where a worthy concept of medicine obtains and informs teachers and students, cannot fail to retain its rightful place amongst the faculties in virtue of what it represents: namely, a discipline that strives to unite science and wisdom into a greater whole.

Such an idea is as old as medicine. Hippocrates has rightly been called the father of medicine, and this is what Dr. Charles Singer, our great historian of medicine, says of him: "Hippocrates will ever remain the type of the perfect physician. Learned, observant, humane, with a profound reverence for the claims of his patients, but an overmastering desire that his experiences shall be of benefit to others, orderly and calm, disturbed by anxiety only to record his knowledge for the use of his brother physicians, and for the relief of suffering. . . . He is a figure of character and virtue which has had an ethical value to medical men of all ages."

This is the ancient tradition, this the ideal, of the university faculty of medicine since such faculties existed, and in so far as we can strengthen this spirit and these aims in the modern faculty of medicine, we shall be giving back to the university of our day something of the spirit which informed the mediaeval university and the university of Newman's thought. We shall also be contributing to the main business of a university—namely, to pass on from one generation to another the tradition of a civilized culture, which is more than the sum of the curricula of its various faculties.

This is how I would wish to see medicine in its university framework, and I venture to believe that Arthur Hall's concept of medicine was neither remote from, nor alien to, this view. Indeed, nothing but the driving force of a high ideal could have made it possible for him to sustain the labours he undertook over so many years that this school of medicine and this university should grow and prosper.

He was a man cast in the true Hippocratic mould, so that the man was even more than what he did: a man not afraid to think highly of his profession and of his duties and of his place within it; and with this example and its harvest around them, his successors surely need not fear to cherish high aims for their university, and especially for its faculty of medicine, in this somewhat mercenary and disillusioned age when medicine is rather more often presented to us in an economic than in an ethical and academic framework.

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