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THE VALUE OF THE HISTORY OF MEDICINE IN MEDICAL EDUCATION

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Among the several reasons that have concurred towards my choice of subject for this St. Luke's Lecture are, firstly, a personal inclination to the study of the History of Medicine of several years' standing and, secondly, a potent reinforcement of this interest by way of a very recent archaeological tour of Greece and the Levant which took me to several sites that St. Luke, in the company of St. Paul, must have visited before that eventful day when a propitious Gregale blew them to our shores — a happening which, among other effects, has resulted in this celebration of St. Luke's Day by us doctors in Malta.

Of St. Luke as a Physician we know little or nothing by way of direct evidence. Even legend has nothing to say of him in this respect, unlike its proliferation as regards his prowess as a painter, whereby hundreds of churches in Europe have made attribution to him of hundreds of their Byzantine or even more recent ikons! That he was a physician cannot be denied, since he is given that specific title by St. Paul himself, and there is much internal evidence besides this in his Gospel and in the Acts of the Apostles. Nor can it be doubted that it was both as physician and as

companion that he went with St. Paul to Cos, Rhodes, Athens, Pergamum and other places that have this summer been the route of my own historical pilgrimage.

The Asklepeia of Cos, Pergamum, Epidaurus, Athens and Corinth were medical shrines of the ancient world which naturally held great interest for me and which St. Luke must surely have visited. Asklepios, if not of divine origin, certainly became in time the Greeks' God of Medicine as Imhotep was to the Egyptians. Homer's testimony would make of him a historical, and not just a legendary personage and his sons Podalirius and Machaon figure as surgeons at the siege of Troy; and who, since Schliemann's excavation of Troy and Mycenae, would doubt the factual historical basis of most of Homer's epic? Every one of the temples of Asklepios was a marvellous combination of holy precinct and medical centre, beautifully sited, offering all the amenities and healing aids that we seek in our spas. There the sick in body and mind congregated not only to be attended by the temple priest-doctors, but also to submit at the incubation to the nocturnal visit of the god in the shape of his sacred serpents; and thence went the healed, loud in their praises, leaving behind them tokens of gratitude in the shape of the "ex voto" that now lie on the shelves of the museums.

I stepped on Cos to stand in the shade of the ancient plane tree sacred to Hippocrates, Father of Medicine. He belongs to History, with records vouched for by Plato, and a fairly reliable birthdate of 460 B.C. His title he well deserves even if only because of Celsus's tribute that he "first separated medicine from philosophy", that is, made personal observations and drew inferences free of preconceptions. The famous Hippocratic Oath in the form that we know it dates only from the 3rd century A.D., but something more than pious belief must have gone to its attribution to Hippocrates. So also the great corpus of 70 to 100 treatises that form the Hippocratic collection is undoubtedly the fruit of various authors at very various dates, but much of it bears the unmistake-

able imprint of one great mind, to whom we must owe the striking Aphorisms, the descriptions of operative technique and, most remarkable of all, the vivid clinical records of actual cases.

Pergamum of the lofty Acropolis and elegant Asklepeion was the birthplace of Galen, and therefore a highlight of my pilgrimage. His was the figure that loomed gigantically in the medical field for many centuries after his practice in Rome about 180 A.D. A hundred works of his became the unimpeachable Bible of medicine, and they were the product of his remarkable activity as the first experimental physiologist and one of the first practical anatomists. He created medical science. For good and for ill, because, naturally, his writings contained fundamental errors as well as much sound truth, his enormous influence on all medical thought and teaching lasted right up to the Renaissance; and it is his blind followers rather than himself who must be blamed for perverting the authority of Galen into a stifling authoritarianism.

Nearer to us in time and place, and of particular relevance to the Maltese doctor, is Rhodes where the Knights Hospitallers of St. John have left us a Holy Infirmary, a smaller but no less interesting prototype of the great Infirmary that made Malta the envy of Europe's hospitals 300 years ago. The Infirmary at Rhodes is well-preserved and functions as a most interesting museum, in contrast to the battle-scarred and derelict state of our former proud edifice, which yet awaits reconstruction as its old clinical records yet await rediscovery and publication.

The value of the History of Medicine in medical Education is my theme, but I could just as well have chosen as a subject, and made out a good case for, the utility of the history of medicine in medical teaching. The differences entailed by my choice of words are real enough and not just terminological, and I must in the first place stress the cultural before I pass to the utilitarian aspect.

No branch of knowledge stamps a firmer or more authentic hall-mark on the cultured and educated man than does His-

tory. History, like everything else, has had its detractors and even its debunkers, and these not only among industrial tycoons; such superficial evaluators of it need not detain us. In as much as medical education rightly claims to be a liberal education, or even an education at all, it must entail a study of the history of medicine. On a reciprocal basis, the history of medicine contributes to the study of general social history in no small measure. Instances abound of how the course of history has been altered by disease. Even as but a part of the wider history of science, the history of medicine teaches general history and therefore represents essential culture.

That Medicine is a science is a self-evident truth which in our day is apt to be over-emphasised rather than the reverse. That Medicine is also an art is no less true, and to the art of medicine the history of medicine can contribute vitally. "A subject that loses its traditions is like to lose its soul", and the traditions of medicine are enshrined in its fascinating history.

Utility, pure and unashamed, also calls in the powerful aid of the history of medicine in the teaching and learning of the facts of medical science. Many a lecturer has gratefully resorted to the more dramatic and even some of the romantic highlights from medical history to re-awaken the flagging interest of a class of bored students! The anecdote which if not strictly "*vera, è ben trovata*" is a great stand-by, and to this category belongs the account of Edward Jenner's appreciation of the pretty milk-and-roses complexions of his dairy-maids and his inferences that they might have owed them to their protection by cowpox from the ravages of smallpox; and again the story of how Halsted came to introduce surgical rubber gloves to protect the hands of his favourite theatre-sister from strong disinfectants!

If medical history, like all history, tends to repeat itself, then a study of the errors that have bedevilled medical progress through the centuries should be a powerful preventive of the repetition of those old errors. It has been said that "the energies of the scientific worker are em-

ployed in correcting the mistakes of his predecessors, and in making new ones of his own". At any rate, making new mistakes is more excusable than repeating known old ones.

Hence it is that eminently practical men who have shaped the curriculum at many famous medical schools have inserted some amount of study of medical history as an obligatory subject, while at many other schools the courses in medical history are voluntary but none the less highly appreciated. At several schools the history of the various medical branches is taught separately by the various teachers, while at others there has been wise acceptance of Osler's insistence that the History of Medicine constitutes an integral entity of the highest grade, fully deserving departmental status with its own staff engaged in both teaching and research.

It is obviously outside my compass to survey medical history generally or exhaustively, or to limit my observations to but one aspect. I think I can best illustrate my view on the value of the history of medicine by some examples from the various branches of medicine that will indicate how the achievements of modern medicine can be traced back to their roots in history, or how certain basic medical principles are illuminated by reference to their historical development.

Anatomy offers itself as the prime and fundamental subject whose origins fade into the mists of time, while yet presenting to-day new facets of an ultra-modern character. The whole subject is redolent of history. Eponymous nomenclature, though now unjustly fallen into disfavour and disuse, is a continuous record through thousands of years of those "magna et minora sidera" who have shone in the anatomical firmament. To be sure, Vesalius deserves infinitely greater remembrance than is accorded to him by an inconstant cranial foramen and tarsal bone, while Poupart probably does not deserve at all that the inguinal ligament should bear his name; so also the uncouth student has been known to attribute the tendo Achillis to anatomical discovery rather than to mythology!! Yet the con-

noisseur will see in eponymy an admirable historical memorial and also a way of following the injunction in Ecclesiastes: "Let us now praise famous men".

The explosive expansion of anatomical knowledge at the Renaissance is as remarkable as the exuberant flourish shown by every other science and art at that climacteric, and is attributable to much the same reasons. Of special significance, however, was the revolutionary concept that authority, even that of Galen, had to be dethroned and replaced by the undeniable evidence of direct personal observation. Right up to the time of Sylvius, the Galenical teaching was quite literally placed on a high pedestal from which the professor expounded it, while far below him the humble and often untutored demonstrator did the actual dissection and tried to make what he found agree with what Galen had described, even when this was quite fanciful or erroneous or based on the dissection of animals. It was Vesalius who first had the temerity to do all his own dissecting almost free of Galenical preconceptions, even to cast grave doubts on the correctness of the sacred texts. The printing press and the artistic genius of Calcar, his illustrator, then gave the world the Anatomy of the new and the true dispensation.

From the history of anatomical discoveries the student can hardly fail to be impressed by the enormous amount of fine and correct detail that was determined by the old anatomists hundreds of year ago with equipment of the most primitive kind, aided only by an insatiable avidity for knowledge and brilliant powers of observation. Surely this should spur the student to a serious attempt at rediscovering for himself the wonders of structure. This is one reason why we so wisely insist on the student learning his anatomy by doing so much dissecting himself.

The fascinating history of dissection has been well documented. It ranges from the blind fumbling of the Egyptian embalmer to the meticulous analysis of the seventeenth century anatomists. Recording the difficulties that have always attended the provision of adequate material,

should serve to impress the student with a proper and grateful regard for the privilege accorded him in dissecting the human body.

The history of Physiology and that of Anatomy are as indissolubly linked as Function to Structure. In fact, History has no more valuable lesson to give us than that wild hypotheses of function divorced from correct observations of structure have been the source of most medical errors through the centuries. Erasistratus and Galen established the theory of the Pneumata, whereby the "natural spirits" were conceived as passing from the liver into the veins, the "animal spirits" from the brain along the nerves, and the "vital spirits" from the heart into the arteries. Galen did demonstrate correctly that the arteries contained blood and not air; however he fell into the fundamental error of postulating invisible perforations in the cardiac septa, to suit his physiological hypothesis even in the face of lack of anatomical proof. For centuries this prevented any approach to the true concept of a circulation of the blood until Harvey's discovery of it in 1620, based at least in part on correct observation of the structure of the valves in veins as demonstrated by Fabricius in Padova in 1603.

Much may be learned from a study of how modern Physiology has developed historically with and from progress in experimental chemistry and physics. The ancients conceived the burning of a substance as being due to its losing "phlogiston". Joseph Black showed that the exact reverse was the case, combustion involving combination with some substance in air. Boyle and Hooke showed that air is essential to most forms of life, and Mayow in 1670 showed that "some constituent of air necessary to life enters into the blood in the act of breathing". The discovery of Oxygen by Priestley came in 1774, and then the stage was set for the exact elucidation by Lavoisier of respiration as a vital function. So again the development of the physics of electricity from Galvani's experiments with frogs' legs led rapidly to significant physiological advances.

Instances abound of how random and disconnected physiological observations accumulate through the years until some genius realises their collective import and integrates them into a great discovery. Of this nature is the story of the discovery of the vitamins. The British Navy in the days of Captain Cook learned empirically that lime juice protected its sailors from scurvy. Dimly realised was the connection of malnutrition and lack of sunshine with rickets, when this condition was so common in English children that it was termed the "English disease". My audience will be specially interested in the well-authenticated observation that the starving French garrison of Valletta in 1799 found its sentries incapacitated by night-blindness. Many years later came the discovery that Chinese coolies who preferred polished rice to the whole grain for their staple diet went down with beri-beri. These four instances contain the kernels of the vital information that could have led to a precocious discovery of vitamins A, B, C and D!

Among all the medical disciplines Pathology stands out, fundamental and pre-eminent. Its history reveals how the postmortem room qualifies as the foundation of the whole medical edifice, or, to change similes, as the great Temple of Minerva Medica herself. Morgagni at Padova performed thousands of autopsies, resulting in 1761 in the publication of his monumental "On the Seats and Causes of Diseases" containing full clinical case-histories with the relevant post-mortem findings. Thus he introduced and established the anatomical basis of disease processes. Not long after him, John Hunter in England made Pathology the basis of the practice of Surgery, creating his fantastically rich museum which not only served as teaching material for countless generations of students till this very day but became a model for pathological museums throughout the civilised world.

Medicine as an art and as a science is learned and practised at the bedside as the very word "kline", Greek for bed, denotes in clinical medicine. As such it is based essentially on practical observation

of the patient. At its origins, however, it was more a matter of theorising on fanciful hypotheses. According to the Aristotelian and Hippocratic canons, there were in the world four qualities: the hot, the cold, the wet and the dry which in binary combination gave rise to the four elements of earth, air, fire and water. From the elements derived the four humours — blood, phlegm, black bile and yellow bile which manifested themselves in man as the sanguine, phlegmatic, melancholic and choleric temperaments. Disease was a matter of disturbance of temperament and medicine observed these changes and sought to correct them, within the narrow limits of these preconceived theories into which all medicine had to be fitted. It was Sydenham (1624-1689) who classified and described numerous distinct clinical syndromes and diseases on a rational basis, with a specific insistence "Go to the bedside; there alone you can learn disease". The great Dutch school particularly under Boerhaave gave an impetus to this new process of distinguishing an infinite variety of diseases. A notable advance at Leyden was that its doctors were the first to obtain their qualifying degree on their examination of actual cases and not on disputation of theses.

The story of Hygiene and preventive medicine teaches how the life and happiness not of individuals but of whole nations has lain at the mercy of disease, and still more of ignorance of disease. It is medical advance in the march of time that has given us not only a greatly increased span of life but a world fit to live it in. In basic terms civilisation can almost be equated with sanitation, and the greatest of Rome's contributions to medicine were abundant water supplies, baths and efficient drains. Moreover, the beneficent spread of Roman colonialism throughout the ancient world, like its British counterpart in our time, saw to it that the mother country fostered similar progress in its dependencies.

Immeasurable and invaluable have been the effects of Jenner's introduction in 1796 of vaccination against smallpox, the classic from which stems all modern

immunology. Epidemiology has its roots in John Snow's demonstration in 1894 that cholera is a waterborne infection and William Budd's discovery in 1873 of the contagious nature of typhoid, in the period when Edwin Chadwick created public health organisation. Malta's one luminous contribution in this field came with Zammit's discovery in 1905 that goat's milk was the agent in spreading undulant fever.

War and disease have been aptly termed the fatal partners. So often in the history of mankind have they collaborated in decimation, that the long record of the great pestilences often runs parallel with that of the great campaigns. Yet the exigencies of war, which have often advanced science, have also led perforce to medical progress. One example I would cite here is Florence Nightingale's work in the Crimea which led to her creation of modern nursing and of modern army medical services.

Bacteriology supplies the best instance of how in medicine, as in war, the critical break-through opens up vast new fields when all advance has seemed to be halted. The discovery of the bacterial cause of so many of the most important diseases must rank as an event of shattering import. As far back as 1546 Fraffastoro gives indications of dim glimmerings of the truth with his "contagium vivum", but it was van Leeuwenhoek who, in 1675, through lenses he had made himself first saw bacteria. Other tentative and ineffectual gropings in the dark are made till the great sun of Pasteur's discovery shoots upon the horizon in 1860. Surely guided by Destiny he works from research on yeast to fermentation in wine and then to disease in silkworms until he can prove that putrefaction is caused by living germs. Destiny now produces the other "man of the hour" in Lister who seizes immediately on Pasteur's theory for the principle he required in controlling wound sepsis by chemical disinfection. Yet wonders will never cease and high drama operates in our own prosaic days when a mould from the murky London air contaminates a bacterial culture in the laboratory of St. Mary's Hospital, and Fleming

observes, acts, infers, records — and makes more medical history.

The dramatic irruption of Surgery into the dynamic, vital, and progressive art and science of the last hundred years from the crude status of mere manual dexterity and craftsmanship of all the centuries before, we owe to the discovery and development of the essential ancillaries of anaesthesia and antiseptics. Before this, surgery was shackled and handicapped. Traumatic and emergency conditions supplied practically all the indications, or rather the excuses, for surgery; hardly ever was it elective or deliberate. Surgery was all too often the counsel of despair, the last resort, "desperate remedy" indeed. It is not altogether surprising that to this very day residual fears and prejudices linger in the folk-memory of the uneducated. Horrors of excruciating pain accompanied the surgery of the bad old days, and the final disappointment of death from infection all too often followed the patient's submission to the torture. Until about a hundred years ago surgery was, in more than one sense, at a dead end.

Anaesthesia was the first step forward. In the early 1800's Humphrey Davy and Faraday suggested "laughing gas" and ether respectively as possible pain killers during surgical operations. It was "from the New World" that the practical application came, in 1842 with Long's use of ether and in 1846 with Horace Wells' use of gas, initially for tooth extraction, followed in the same year by Morton's use of ether for excision of a tumour in the neck at Massachusetts General Hospital. On this historic occasion, the surgeon paid his pithy but eloquent tribute with the words "Gentlemen, this is no humbug!" Within the year, Dr. Oliver Wendell Holmes gave the world the term "anaesthetic" and in London Robert Liston having amputated a leg under ether turned to his admiring audience saying "This Yankee dodge beats mesmerism hollow!" So fast did the glad tidings spread that within 3 months, in March 1847, Spencer Wells was using ether at Bighi Hospital, Malta.

For as long as the world shall last,

the history of Surgery will be divided into two eras, "Before Lister" and "after Lister". Anaesthesia made surgery endurable; antiseptics made its results durable, by saving the lives of those who had formerly run risks from infection no less serious than those of the operation itself. Before Lister, disastrous infection could follow the simplest surgery, so that a king who was gratefully surprised at the happy outcome of the excision of his sebaceous cyst rewarded his surgeon with a knighthood. The surgeon operating in an old frock-coat encrusted with the blood and filth from hundreds of previous operations, pulling his ligatures out of the buttonhole where he had threaded them at the start of the day, picking his scalpel from the dirty floor, could see no connection between these conditions and the "hospital fever" which carried away his patients days after the operation. He welcomed the suppuration of his operation wound with "pus bonum and laudabile", knowing only vaguely by tradition and experience that this indicated a localised and non-invasive infection. Contamination and infection were indeed quite meaningless terms until Pasteur revealed the essential role of bacteria in these processes. The genius of Lister lay in his appreciation of the significance of Pasteur's discovery, and still more in his practical application of chemical methods of destroying bacteria i.e. antiseptics, soon to be followed by the sounder principle of asepsis. Thus did he earn in 1865 the incontestable title of Father of Modern Surgery. Thus did Surgery at last attain the therapeutic ideal of "cito, tuto et jucunde". The advance thus made possible has resulted in the surgeon being deterred by no pathological condition in any site of the body, so that surgery is now in the proud position of being confidently sought as the preferred and sure means rather than the desperate remedy, as the safe and certain cure where all other therapy may be impotent.

If these and so many other medical specialities have such fascinating aspects to their millennial history, no less does the basic discipline of General Practice through the ages present notable features

of value in medical education. The family doctor is as old as medicine itself, and a study of the varying standards of his work, and of the conditions in which he has carried it out, has much to teach us. The very status of the doctor has changed with the centuries. When the physician was more than somewhat of a magician, he could be regarded as semi-divine. The practical Romans of the time of Julius Caesar, according to Suetonius, gave all their physicians the great benefits of Roman citizenship. Almost within living memory, the doctor's frock-coat and goldheaded cane were symbols not merely of affluence but of the respect in which he was held in the repute of his fellowmen. Ups and downs are man's natural lot, but it is a chastening thought that the recent trend of change in the status of the medical profession may have been gradually and subtly for the worse! It is supremely ironical that today, when the doctor can be something more than a pompous and ignorant humbug, when he has at his command an impressive diagnostic and therapeutic armamentarium, respect for the doctor may have lessened. Why should this be? Is it just a matter of familiarity breeding contempt by way of a certain loss of mystique, resulting from the modern diffusion of medical knowledge among laymen? If it were so we would count it no very great loss. But can we be sure that there is not some much more serious reason, such as a decay and decline in the personal human relationship between the doctor and his patients? And will not this decline reach its nadir when the doctor can no longer say "Everyman, I will go with thee and be thy guide, in thy most need to go by thy side", because he has become just another State functionary with an allegiance other than that of the interests of his patients as his supreme consideration?

It is in the mutual Love of Doctor and Patient that the medical relationship can find and keep its soul. In the Epistle to the Colossians, St. Paul crowned St. Luke with the beautiful title of THE BELOVED PHYSICIAN. Would that we could all attain to its deserving.