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READJUSTMENTS IN MEDICAL STUDY THE MEDICAL CURRICULUM*

BY

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The medical profession is engaged again in its periodic task of revising its course of academic study. A special committee of the General Medical Council has drafted a new curriculum in place of that which came into operation in 1923. It would appear that certain readjustments are imminent. The principal subjects remain as formerly, with some necessary amplification in such expanding departments as physiology, and in new methods of precision in clinical studies, with some modification in the order of events. The course will occupy the same period as before—namely, five years. As hitherto, the licensing bodies and the profession itself are invited to offer constructive suggestions, and my impression is that wider and more considered attention is being devoted to the subject than formerly.

In addition to valuable criticism by the licensing bodies, whose business it is to fulfil and discharge the curriculum, and to enlightened propositions in the medical press, the British Medical Association and a conference of eighteen representatives from the Universities of London, Oxford, and Cambridge, the Royal Colleges of Physicians and Surgeons, and the Society of Apothecaries of London, have given the subject prolonged and deliberate scrutiny, and have furnished two extremely able and entirely admirable reports in every way worthy of your consideration. These reports and the notes and draft of the General Medical Council are now before this University and the whole profession for consideration and wise counsel.

I have ventured to describe the changes which are proposed and seem to be probable as readjustments. Nevertheless, the tendency of this revision seems to me to be definitely in the direction of reform. Our aim is to produce competent medical practitioners and not "specialists" (a stage which comes later, if at all). First, there seems likely to be, in the new curriculum, more practical work, fewer lectures, and less "looking on"; secondly, there is, I hope, to be more study of the living and normal body and less time devoted to the dead body—the living body in its wholeness, its genetics and its psychology, its biology and its sociology; thirdly it is proposed that provision should be made for residential periods of study in medicine, surgery, and obstetrics, a long-foretold reform, the administrative difficulties of which will certainly be compensated by a large gain of needed clinical experience; fourthly, closer and more continuous attention is being claimed for the study of health, its creation and maintenance, and the principles and practice of the preventive aspects of medicine and surgery; and fifthly, all responsible critics have emphasized the need for a scholastic foundation of cultural education.

To learn the science and art of medicine it is admitted that a scientific outlook is necessary—the critical but

balanced judgement, the historical spirit which looks before and after, the inquiring mind which explores. These are the fruits of a love of learning and of true culture of soul and intellect—"that heart and mind according well, may make one music as before, but vaster." There is one other demand of a rather deeper character which should in my judgement be met. This demand would have been described by Cicero as *integritas*. We have a modern term for this deeper affinity: it is the "integration of medicine." This implies the interrelation of its several parts in one whole (as the several members of the body itself are conjoined) following Aristotle's "double track of the many into the one, and the one into the many"; it implies also the total unity and mutual interdependence of scientific truth. It is upon this theme that I propose to submit some brief observations for your reflection.

Dr. Fielding Garrison

In doing so I would respectfully invite you, on this inaugural day, to commemorate the life and work of Dr. Fielding Hudson Garrison, colonel in the United States Army, historian and integrator of medicine. "Let us now praise famous men, and our fathers that begat us, whose righteous deeds have not been forgotten. *With their seed shall remain continually a good inheritance.*"

Fielding Garrison, one of the greatest historians of medicine, was born at Washington in 1870 and died in the Johns Hopkins Hospital at Baltimore in April last. Though this remarkable man became one of the supreme historians of medicine, the Sudhoff of English medicine, his name was not widely known in this country, for he lived, like our own historian Charles Creighton, the reclusive life of a scholar, modest and unassuming. After taking his medical degree in 1893 he joined the staff of the library of the Surgeon-General at Washington, working in its seclusion for nearly a quarter of a century. After the war he became consulting librarian to the New York Academy of Medicine, and subsequently to the Welch Medical School library at Baltimore. His official work was the *Index Medicus* and the *Index Catalogue* of the Surgeon-General's library, but his legacy to us was his masterly and monumental *Introduction to the History of Medicine* (1913-29) and his miscellaneous historical papers in the *Bulletin* of the Academy of Medicine. For here is a grand inquest of the philosophy and science of medicine; here are facts arranged in an order which shall deliver their meaning—one of the most impressive and inspiring treasuries of medical history which have ever been written in the English tongue.

But Garrison did much more than this. He edited for publication the manuscript of Sir William Osler's Yale Lectures on the *Evolution of Modern Medicine*, which Osler described as "an aeroplane flight"; but the book

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has become a land of promise for every aspiring student, produced by the "best-balanced, best-equipped, most sagacious and most lovable of all modern physicians." Garrison also edited the English translation of Sudhoff's *Essays on the History of Medicine*, and gave us a graphic and authoritative account of Sudhoff's stupendous labours and his historical methods. Garrison was also an international correspondent, and the friend and helper of every kind of investigator and every lover of true learning. With immense diligence and persistence through all his years, he dedicated himself and his profound learning to his duty and to his friends, with a liberality, a versatility, and an habitual good humour rarely to be found in one man. It is appropriate that we should gratefully commemorate to-day the splendid work and noble life of Fielding Garrison, historian and integrator of medicine.

The integration and unity of medicine cannot be apprehended without a vigilant appreciation of the potential and kinetic value of its history. Let me urge you to its careful study, now and when you enter medical practice. Goethe used to say that he who cannot render an account to himself of at least 3,000 years of time will always grope in the darkness of inexperience and merely live from day to day; and old Thomas Fuller the seventeenth century historian and author of *The Worthies of England*, one of the favourite books of Sir William Osler, said that history "maketh a young man privileged with the accumulated experience of the ages and able to make conjecture of things to come." Speaking of the student of science Goethe added that "the history of science is the science itself." This is particularly true of medicine. You begin by taking the history of the patient and you end by recording the history of the case and results of your treatment (if any), and it was out of such records that Hippocrates became famous as the Father of Medicine.

So for you medical history is more than culture, it is, as Garrison says, *your business*. It increases your understanding of the relation of your patient to that varied and complex social environment which surrounds him and has a bearing upon his sickness; it connects your daily work with all other arts and sciences; it proves what in life is possible, what is fugitive, and what endures; it shows the relation of medical practice to the State and community; it is a clear, cold record of cause and effect, for good or evil; it is a lesson in the development of ethics, and provides an inexhaustible fund both of entertainment and of idealism; it is, as the House of Lords discovered the other day, the only fundamental and inescapable answer of the medical man to the diverse and alluring claims of the magician, the quack, and the charlatan; and, lastly, it is the exclusive method of demonstrating the unity of medicine and the mutual interdependence of its constituent branches. Your appreciation of history as a student and afterwards as a practitioner will be of inestimable pleasure and advantage to you, in work, in leisure, and in travel.

In illustration of the principles that should guide us in forming an opinion upon any revision of the nature and character of that sort of integrated medical study which Sudhoff and Garrison have spent their lives to establish, I submit for your consideration three points suggested by a bird's-eye view of the history of medicine from 600 B.C. to our own time (2,500 years in all). We see three great periods: first, its rise among the Greeks (Hellenic, Alexandrian, Roman) covering 800 years (600 B.C. to A.D. 200); secondly, a long period of deadening suspension during the Byzantine and Arabic domination, 1,300 years (from A.D. 200 to A.D. 1500); and thirdly, its renaissance from the sixteenth century to the present time.

I. The Principles of Greek Medicine

To those who have reflected upon Greek medicine, or have visited the Near East, or have sailed among the islands of Greece many happy dreams will recur. In those sunny lands, in the youth of man's intellect, there was born the character of English medicine, and we do well from time to time to check our thoughts and standards by those early pioneers who laid down for all time the foundations upon which we build. Sir Henry Maine, the jurist and professor of law at Cambridge, said that "nothing moves in the modern world that is not Greek"; and Sudhoff of Leipzig, the historian of medicine, says that "Greek medicine is the purest strain of medicine the world has known." It is therefore worthy of our careful attention. We cannot now review the heroes of Greek medicine, or pass through the colonnades of the temples of Aesculapius, or even accompany the rather indistinct figure of Hippocrates from house to house, and revisit his humble patients whose very names and maladies his clinical notes have made immortal. Though much has faded, much remains of the past: the actual places, the traditions, the papyri, the votive offerings, the epitaphs, the altars, and above all the written doctrines of the Hippocratic corpus of medical notes so clear that even he who runs may read. Here are four of them, and there is not a student or practitioner in the British Commonwealth who can afford to neglect or deny them. Examine them, reflect on them, practise them.

1. Medical practice is to be based on exact and accumulated observation of actual patients (and not upon rule-of-thumb notions). A definite attempt is to be made to elucidate the nature, cause, course, and result of the malady from which the patient is suffering. In a word, the doctrine and practice of Hippocratic medicine is to be a *rational* study in clinical work, and is not concerned with magic, priestcraft, or superstition, nor with theories, or theurgy, or assumption, but by accurate observation of the facts, both signs and symptoms, and by reasoning and interpretation from such facts a diagnosis and a prognosis are to be made.

2. Reliance is to be placed upon the inherent natural (that is, physiological) faculties and powers of the body likely both to predispose to disease and to heal it. Disease is not an external entity attacking the body from without, but is caused by a disturbance in the natural composition or relation of the constituents of the body, not seldom due to climatic, atmospheric, dietetic, and environmental conditions and circumstances. "Nature is the healer of disease," and its causation is according to natural principles and not to be attributed to hazard or caprice.

"I hold that it is necessary to know which diseased states arise from powers (or functions) and which from structures in the human body. . . . I mean to possess this information, *what man is, by what causes he is made*. This, at least, I think a physician must know about natural science, if he is going to perform aught of his duty, what man is in relation to foods and drinks and to habits generally, what will be the effects on each individual." (*Ancient Medicine*.)

Treatment and prevention are to be provided by the physician for the assistance of nature (and not in opposition to it) by the removal of hindrances and by strengthening the body and fortifying its capacity of resistance—namely, by appropriate application of air and water, by living in a sound and health-giving environment, by a way of life, by diet, exercise, rest, baths, barley-water, wine, honey, and vinegar, by the administration of purgatives, emetics, massage, venesection, fomentation, etc.

3. The clinical observation and diagnosis is to be conducted for each individual patient by the *inductive*

method, associated, of course, with experience and appreciation of cause and effect (as regards seasons, airs and winds, waters, situation of towns, personal habits). (*Airs, Waters, and Places*.)

4. In order to understand man and the ailments of his body it is necessary to have ethical and social concepts, comprehension, and a sense of values, being sceptical of the unverifiable. The "Hippocratic Oath" is an early and succinct example of those noble rules of conduct which have raised the art of medicine to the high and trusted position it now holds.

"In my opinion these maladies like all other things are divine; no one thing is more divine or more human than another, for all things are alike divine; yet each one has its own natural properties, and cannot come into existence without natural causes." (*Airs, Waters, and Places*.)

At the end of the fifth century B.C. these now familiar principles, though coming out of a long past, were new, positive, progressive, and pregnant with issue, and the men who practised them in the schools of the physicians at Rhodes, Cos, Cnidus, Croton, Epidauros, Carystus, Alexandria, and elsewhere were separate and different from the men who did not—and so it is to-day. Then, as now, there were other techniques used in practice: empirical, arbitrary, capricious, magical, and determined by other objectives. But from the Renaissance—Arabic, Italian, or English—British medicine has been founded upon these Hippocratic conceptions, which remain your shield and safe anchorage.

II. The Warnings of the Dark Age of Medicine

Down through the centuries these principles were often forgotten or forsaken, particularly from A.D. 200 to A.D. 1500, the long period in which the advance of medicine was suspended, in spite of a glorious group of medical heroes and prophets who spoke to deaf ears, or whose works did follow them. There were in Europe barbarisms, long-continued and devastating wars, pestilences (such as leprosy, the Black Death, ergotism, and syphilis), and various political and racial upheavals, which, following the downfall of the Roman Empire, wholly preoccupied men's minds, and estopped or rather allured them from the progress of science in general and medicine in particular. Yet, in spite of war and pestilence, the arts of architecture, painting, and sculpture flourished, and statecraft enormously advanced. What then were the causes of the pause in the progress of Hippocratic medicine? They were no doubt complex, but out of a welter of confusion two facts emerge and prevail until they have rule and ascendancy.

First, Christendom and feudalism, the two dominating factors of mediaevalism, combined to protect Europe from the vast sweep of the Arab-Moslem invasion of the seventh and eighth centuries which threatened to engulf it. They were, fortunately for us, victorious, but in winning their triumph, its circumstances and results annihilated for some centuries, as Sir Clifford Allbutt established, the intellectual independence of the individual, requiring the thoughts of men to be restricted under the ban of authority. "Logic was for the Middle Ages the only means of discovery, the very source of truth," and it was logic which was formal and deductive only. After the Greek period and until the Renaissance there was, speaking generally, neither induction nor experiment.

Secondly, although all through this dark time the religious urge of Christendom conjured men to build universities, cathedrals, and hospitals—each contributory to the healing art—the fundamental error of mediaeval medical science was the divorce of medicine from surgery. The Greeks had envisaged the practice of medicine with a *surgical mind*, not only as a mode of practical therapy

but as "the very right arm of internal medicine," since in the primary act of diagnosis the outward and visible signs of internal malady were the only assurance of the clinician, and in the secondary act of laying the hands on the patient the only contentment of the sick. Avicenna and the Arabs misinterpreted this Greek principle, believing that rede-craft was superior to handicraft, exalting drugs over the knife, and holding that "coction" (suppuration) was essential to the healing of wounds. Although Roger and Theodore of Salerno, Salicet of Bologna, and Langfranchi of Milan were the surgeons of the Middle Ages who stand out as the seers of a new time, as the disciples of the Greeks in Europe and as the forerunners of Paré, Hunter, and Lister, internal medicine remained essentially scholastic and monastic, and could not, and did not, advance so long as it preferred the sterile and dead hand of logical syllogism to the living inductive facts and experiment of clinical study.

The lessons of the "pause" are clear for us, and they were abundantly ratified at the Renaissance and have been confirmed in our own day and under our own eyes. As practitioners of the science and art of medicine, of whatever branch, we must never surrender to any external authority, Church or State, but only to the truth; we must never exchange the intellectual independence and freedom of the individual practitioner for collective or academic regulation; we must not allow formal and deductive logic to usurp inductive reasoning; and we must not be willing to divorce *any* branch of our science or art from the total "unity of medicine." Internal medicine and clinical surgery are dual aspects of the healing art, and it is unwise to separate them in education or in practice, as it is unwise to permit the divorce of any of their partners. Preventive medicine, obstetrics, manipulative surgery, immunology, are but applications of the science and art of medicine. Let us take no step which will make them separate entities, or isolated subjects or sciences, for they are mutually interdependent. Let us follow Aristotle's double track of the one into the many, and the many into the one.

III. The Scientific Basis of Modern Medicine

We are all familiar with the fact of the awakening or new birth of medicine which we call the Renaissance. It began in the middle of the fifteenth century and, like the Industrial Revolution, it continues to-day. We have been privileged to live in a Golden Age of medicine, and it is as difficult as it is historically fallacious to restrict the Renaissance to its advent. Fielding Garrison was fond of saying that the decennium from 1846 to 1855 was "the most brilliant in output and far-reaching in consequence in the whole history of medicine." Surfeited as we are with recent arrivals such as x rays, salvarsan, insulin, endocrinology, radium, the cinema, the aeroplane, and the wireless, we are apt to forget that the middle nineteenth century had also its *tempus mirabile*.

Consider Garrison's "brilliant period" of the giants of experimental medicine. Claude Bernard, the greatest physiologist of modern France and the founder of experimental medicine, made his famous researches into the digestive contribution of the pancreatic juice, into the glycogenic function of the liver as of the nature of an "internal secretion," into the vaso-dilator and vaso-constrictor nerves as they affect the circulation of the blood, and into man's dual environment, the external variable environment and the internal environment of the body the constancy of which is maintained by its circulating fluids. "Put off your imagination as you take off your overcoat when you enter the laboratory," said he, "but put it on again as you do your overcoat when you leave the laboratory." Thus he worked, know-

ing the profound truth of the enlightenment of experience by the imagination. Bernard's younger contemporary, Helmholtz, published his work on the conservation of energy, located a source of animal heat in the muscles, measured the velocity of nerve current, and invented the ophthalmoscope. Though he stood near the summit of human thought he never forgot he was a physician. As a popular expositor of science he is only approached by Huxley, Tyndall, and Sir Arthur Keith. In 1846 Morton administered ether anaesthesia for a surgical operation at the Massachusetts General Hospital, and in the following year Sir James Young Simpson produced chloroform anaesthesia in himself at his house in Queen Street, Edinburgh. Then there was Semmelweis, the Hungarian, assistant obstetrician in Vienna, who recognized puerperal fever as a septicaemia, conquered it by antiseptic methods in his own wards, and thus reduced excessive maternal mortality. He may be said to have died in defence of his work. Garrison said he was "one of medicine's martyrs, and in future will be one of its far-shining names, for every child-bearing woman owes something to him."

Another of the immortals of this decennium was Carl Ludwig, professor of anatomy and physiology for nearly half a century at Marburg, Zurich, Vienna, and Leipzig, and of whom Sir Lauder Brunton used to say he was "like the great architects of the Middle Ages who built the wonderful cathedrals which we all admire and whose builder's name no man knows." He invented instruments of measurement of vital processes, and explored urinary excretion, lymph formation, innervation of the salivary glands, and the hydraulics of the circulation. He was second only to Boerhaave of Leyden as a teacher of international pupils, and was almost as versatile and enchanting as Goethe. But I must not weary you with details of the great names in medicine from 1845 to 1855. There was James Marion Sims on women's diseases, Addison on pernicious anaemia and the suprarenals, Waller on degeneration of the spinal nerves, von Kolliker on histology, Cohn on the nature of bacteria, Garcia on the laryngoscope, and there was the glittering fame of Florence Nightingale. Nor is this all, for Louis Pasteur was then at work at Lille on the cause of fermentation, and Charles Darwin in Kent was writing *The Origin of Species*. Here in the short span of ten years were laid the scientific foundations of modern medicine. They were also much more than foundations. They have proved to be the *raison d'être* of our science, they establish the validity of medical and surgical practice, and they are the ultimate defence against all magic and medical imposture.

IV. The Applications

Let us count up our gains and the legacies of our inheritance as represented in these three illustrations. We possess the positive principles of Hippocratic clinical medicine; to this we add the solemn and significant warnings of the Dark Ages—the thralldom of authority, the negation of the unity of medicine, the divorce between medicine and surgery, the absence of the independence and freedom of thought, and the neglect of inductive and experimental medicine; and thirdly, we have the marvellous return of the Greek spirit in the Renaissance and its outburst in a brilliant decennium of the nineteenth century, in which brief period there were born the far-reaching and dynamic truths of internal secretion, of control by the nervous system, of anaesthesia, of antiseptics, of the physics of the circulation, of endocrinology, of bacteriology, and of medical sociology. What a galaxy for our encouragement and guidance! *And what are we doing with it all?* Remember the term "we" stands for the competent medical practitioner, still the backbone of the profession, preventive and curative.

First, we must integrate the substance of this knowledge and experience of the "wisdom of the body"; we must be vigilant to make it a vital part in our study and our practice of the unity of medicine. This splendid tapestry of scientific truth, well woven in warp and woof, is our inheritance, and the opportunity of every happy medical warrior, as Wordsworth said, to "turn his necessity to glorious gain." Yet that is not the whole of our duty. For, secondly, as well as apprehending the wisdom of the body we must have what the ancients called "the understanding of the heart." Do not forget that the years 1847 and 1848 fall within this same far-reaching decennium of which we have been thinking. Those years marked the commencement of the organization of preventive medicine by the State in the interest of national health (Towns Improvement Act, 1847, Public Health Act, 1848), and into which organization have been brought the medical practitioner and the medical officer of health. We are all familiar with the grand procession of events that has not only changed the face of England but also incidentally the whole future outlook and service of English medicine. For it created a wider sphere and opportunity for the medical practitioner to apply the principles of preventive medicine, in his own practice and far beyond its borders, both to the beginnings of disease and to its sequelae. We have but to recall the fact that there are now, all over the country, no fewer than 20,000 registered practitioners engaged wholly or partly in the public service of the community, to realize the profound revolution which has taken place in our own time in the sphere and scope and compass of English medicine. We are now enlisted, by the will of the State and our own assent, in the service of the community under the Poor Law and Public Health and other Acts, in maternity, infant welfare, and school medical services; in health insurance; in dealing with tuberculosis, venereal and infectious disease, and mental deficiency and lunacy; in orthopaedic and preventive surgery; in medical research; in municipal hospitals; in the industrial and factory system; and in the public and personal teaching of hygiene.

Lastly, all this vast development and the varied and far-reaching social issues which emerge from it must come within the consideration and foresight of those who would "take occasion by the hand and make the bounds of freedom wider yet" in readjusting the course of medical study in an age of preventive medicine. For generations we have been brought up on an individualistic basis, concerned chiefly with the healing of the diseased body and ministering to the disordered mind, and "so credulous of cure," as Shakespeare said. But circumstances outside our control have been making a new kind of demand upon us, threefold in its application. We must become more *communal* in outlook; we must become more *preventive* in purpose and intention; and we must address ourselves to a *positive and constructive interpretation of health* and wholeness of body and mind. We are learning that the science and art of medicine must fulfil and justify itself in new ways for the betterment of man's estate. Its practical value in the minds of men depends upon its capacity to "deliver the goods," as the man of affairs would say. The art of medicine, he would add, is a potential commodity which should direct itself to raising the whole standard of the life, health, and capacity of all classes of the community. We cannot decline to take our share in such an enterprise. While we may recognize the widening province of curative medicine we should not allow ourselves to become too exclusively absorbed in the alleviation of morbid conditions and disharmonies of the body that we fail to become what Matthew Arnold called "helpers and friends of mankind," in its search for a more abundant physical life for the whole community.