Ars medici : an essay on the doctor's art and its relation to science / by John H. Clarke.

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HENRY TURNER, 170, FLEET STREET, E.C.
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In the following Essay the writer has endeavoured (he trusts not altogether without success) to clear up a subject which he has long felt much needed clearing. If anything further were required to show how great the need was, a passage from Dr. Lewis Shapter's Presidential Address on *The Science of Medicine*, just delivered before the South Western Branch of the British Medical Association, would amply suffice. In this passage the terms "work," "science," "art," "practice," are used so confusedly that it is impossible for the reader to distinguish any difference in their meanings. Dr. Shapter said:—

"When we regard medical work as involved in a true science, we must look to ourselves as units amidst a great concourse of actors, taking our place amidst a vast concourse, whose object is to strive to advance a general art—the prevention, alleviation, and cure of disease; and the branches of practice into which the art may be disseminated must only be regarded as means to produce this general end. This is the true and full meaning of the 'practice of medicine' as a 'science'" (*British Medical Journal*, July 5th).

This is confusion worse confounded.

In the final shaping of his thoughts the writer wishes to acknowledge the assistance he received from a study of Mr. Ruskin's volume of Oxford Lectures entitled *The Eagle's Nest*.

15, St. George's Terrace,
Gloucester Road, S.W.;
July, 1884.

ARS MEDICI.

I.

The confusion of ideas that prevails throughout the medical profession as to what is science, and what is art, and what are the right relations between the two, could hardly be better illustrated than by placing side by side two sentences extracted from one of the medical journals of last year. In March, 1883, the *Medical Times and Gazette* said: "Marwood appears to have reduced his calling to a science:"—and in December of the same year: "The fact is hanging is not a science but an art, and is better done by rule of thumb than by theory." Among the many baseless assumptions contained within the narrow limits of this marvellous pair of sentences three stand prominently forth. The first is the assumption that it is quite possible to convert an art into a science. Next, it is assumed that a science as well as an art is concerned with action. And, lastly, the distinction between an art and a science is assumed to be that the former is governed in its operation by rule of thumb and the latter by theory.

This confusion is not by any means confined to the medical view of the gruesome function of the common hangman—a function which the soaring ambition of the *Students' Journal* would fain include within the duties of the professor of life-saving—it affects the whole domain of medical thought "Hitherto," says the *Lancet* * [surgery] has been too much of an art, too little of a science." "Before therapeutics"—the art of Healing, proper,—"can become a science," says Dr. Lauder Brunton,† "the physician must know the action of his drugs, just as the locksmith does that of his keys, and since pharmacology is

* Jan. 5, 1884. † *Pharmacology and Therapeutics*, p. 66.

still so young, it is little wonder that medicine is as yet only an art:"—here the conversion of the art of Healing into a science is assumed to depend on the perfecting of our knowledge of the action of drugs. Until this is accomplished, Therapeutics must remain "*only* an art."

The confusion of thought betrayed by these quotations—and they might be multiplied *ad infinitum*—would be ridiculous, simply, were it not fraught with such lamentable results to medical teaching and medical practice. The unreflecting mind of the medical student being impressed from his first entrance on his studies with the notion that art and science are convertible things, and that science is immeasurably superior to art, he soon learns to despise what is "only" an art, and cleave to everything that has the appearance or reputation of being scientific. The energy and devotion which should be spent in acquiring skill in the practice of his art are squandered in vain endeavours to find scientific explanations of the inexplicable; theories that shall satisfactorily dispose of the mystery that underlies all the phenomena of life, in health and in disease. Until this desirable end has been attained, the doctor's function must remain "*only* an art;" and the student and the practitioner need not expect to be able to do very much for their patients.

Needless to say, all this is folly unutterable. Science is science; and art is art. The two, though closely related, are absolutely distinct—as distinct as the clay is from the potter who uses and fashions it. Science is knowledge—the knowledge of facts duly ordered in their right relations. Art is action—the skilled performance of right acts. Knowledge may be imparted: practical skill can only be acquired by rigid self-discipline and patient exercise of natural powers. No perfection in knowledge will ever do away with the need of artistic skill in applying it: action will never be knowledge nor knowledge action to the world's end.

II.

Partly accounted for by this confusion of thought, and

partly, also, accounting for its continuance, is the loose and indefinite use that is made of the term *medicine*. Now it is used to designate the whole domain both of medical art and medical science; now it is used to express all that concerns the natural history of disease except its modification by treatment. When the special function of the medical man—the treatment and cure of the sick—is wished to be indicated, the term medicine is rarely used, but another, therapeutics, is employed instead. So far, indeed, has the idea of curing been dropped from the term, that the etymologically ridiculous phrase of "preventive medicine," as applied to sanitation, now startles no one. In this essay I shall avoid the term altogether. I shall speak of the doctor's art and the doctor's science. I use the term "doctor" generically as covering the whole ground occupied by physician, surgeon, and midwife. The functions of all these are often combined in a single practitioner; the distinction between them is one of convenience merely, not of essence.

The art of the medical practitioner is made up of two arts. Of these, one is the art of Healing, proper. This consists in the skilled appliance to the sick of those means which are capable of so modifying disordered conditions of the organism as to bring about cure or relief. The other, quite distinct from this, is the art of Distinguishing, or, as it is commonly called, Diagnosis.* This is the art of recognising disordered states of health and of determining the nature of these disordered states.

Each of these arts is based on a distinct science.

The science on which the art of Healing is based consists in the knowledge of the powers possessed by all the various means and substances which are capable of curing or relieving diseased persons.

The science on which the art of Diagnosis is based con-

* I use the term *diagnosis* in its widest sense. I include under it distinguishing between states of health and states of disease, and distinguishing the different states of disease from each other. I include, also, distinguishing the nature and gravity of any given state of disease, and determining its probable duration and issue. Prognosis, or forecasting, is really only a branch of diagnosis.

sists in the knowledge of the constitution of the human body in health and in disease: a knowledge of all the varied disturbances which the body undergoes in disease, and of the natural history of these disturbances.

These two arts—Healing and Distinguishing—sum up the functions of the medical man. It is for the performance of these alone that his calling exists; it is these alone which give the distinctive character to his life in the State. Whatever other functions he may have had imposed upon him, or may have taken upon himself, these are not proper to him as a medical man. In order to carry out his functions efficiently it is necessary for him to know the sciences on which the arts are based; but it is not the knowledge that gives him his distinctive character; it is the practice of his arts—the skilled application of his knowledge—that makes him a doctor.

I have said that these two arts—Distinguishing and Healing—and the sciences on which they are based, are entirely distinct. I will endeavour to make this plain. A doctor is called to a patient suffering from ague. By virtue of his knowledge of the constitution of the body in health and disease he is able to distinguish by the symptoms manifested the nature of the patient's malady and to forecast the result. But having done this with perfect success, he would never by this means have discovered the power of *Cinchona Bark* to quell an attack of ague. This is an altogether different kind of knowledge, and the application of it an altogether different art. By some happy accident the power of *Bark* over ague was discovered by the dark-skinned natives of Peru: there was nothing in the ague-fit to suggest that *Bark* possessed this power. Ague had been diagnosed for centuries, but diagnosis had never suggested the power of *Arsenic* or *Cinchona* to cure. By the use of *Cinchona* in ague its powers over the disease and the limits of those powers have been more or less accurately defined. The knowledge of those powers constitutes the science of Healing so far as this drug is concerned in its relation to this disease. The art of administering the drug in suitable doses, at proper times, in accordance with all that is known

of its powers, is an altogether different art from that of recognising the disease. The two arts must be combined in the medical man: he must be able to answer, What is wrong? as well as, What is to be done? Usually—but not by any means always—he must answer the first before he can answer the second. But though thus intimately connected, the two arts are in nature and essence distinct.

I have said that in order to practise his double art successfully, the doctor must know the two sciences on which his art is based. In this I have expressed the relations that rightly obtain between science and art, and consequently between the sciences that the doctor ought to know and the arts which he practises. The knowledge of the characteristic symptoms of ague is one thing;—this is the science of Diagnosis: the skill exercised in observing these symptoms in a given patient, in distinguishing them from the symptoms of other diseases, and in determining their gravity and import is quite another thing;—this is the art of Diagnosis. The knowledge of the power of *Bark* to extinguish an ague-fit, and in certain cases to cure the disease, is one thing;—this is the science of Healing: the skill required to prescribe the drug in right doses at right times is quite another thing;—this is the art of Healing. By no conceivable—or inconceivable—process can the knowledge of the conditions to be dealt with—science—be converted into skill in dealing with the conditions—art. The function of the medical man is an art:—yes; "*only* an art." So it has been since the days of Hippocrates and before him; and so it will be to the end of time. It is his duty to know a great deal before he can profitably discharge his functions; and this knowledge is his science. But much as he may know, however learned in his science he may be, unless he has by patient exercise and cultivation of his powers acquired practical skill in relieving the sick, he is not a medical man at all—he is a scientist merely, not an artist.

A patient of mine, himself an artist and well able to appreciate artistic qualities, has at different times had to undergo a painful surgical operation. The operation has been performed by surgeons of the highest eminence, first

by the late Sir W. Fergusson, and afterwards by a surgeon now living. The conditions under which the operation was performed on the two occasions were as nearly as possible exactly alike. In point of scientific attainment there was nothing to choose between the two operators. But my patient tells me that nothing would induce him to put himself a second time into the hands of the surgeon who operated after Sir W. Fergusson :—the operation by the two men was quite a different thing. In the hands of Sir William he felt at once that he was in the hands of an artist : the very touch of the other was quite different from his : the amount of pain caused by the two surgeons was out of all proportion. Now, wherein lay the difference? Was it in knowledge of anatomy, physiology, and all the other sciences supposed to be necessary for the medical man to know that Sir William was superior to the other? The mention of the other's name would at once negative such a supposition. The difference lay here—Sir William was an artist. By patient cultivation of his natural powers he had acquired a skill which the other did not possess, and which no degree of proficiency in science could make up for.

Do not let it be supposed that I object to scientific medical practice. The practice of Sir William Fergusson was more scientific than that of the other, not because he knew more, but because he had mastered the art of putting in practice what he knew. His work was in stricter conformity to the conditions to be dealt with. He who knows accurately all that can be known of the human frame in health and in disease, and who, acting on this knowledge, applies his skilled powers in distinguishing the diseased conditions in a given case—this is a scientific practitioner. He who knows all that can be known of the powers of remedies over diseased conditions, and who, acting on this knowledge, brings skilled power in the use of these means to the service of the sick—this is a scientific practitioner.

But this is not what is usually regarded as deserving the name scientific in medical affairs. What is so regarded was clearly shown at a meeting of the Materia Medica Section of

the International Medical Congress of 1881. At the close of a discussion in which a number of physicians of experience had brought forward important facts observed by them in the treatment of disease, the President, Prof. Fraser, of Edinburgh, made a few observations. He said that the remarks of the speakers, with one exception, had not come up to the scientific level of the day. The one speaker who was thus honourably excepted was Dr. Murrell, who had spoken of the behaviour under the action of different drugs of the hearts of frogs cut out of their bodies! Now, until it is determined what relation exists between the excised heart of a frog and the heart of a human being in the body, this is not medical science at all: it helps the medical man no whit in discovering what is wrong with his patient, nor in putting that wrong right. This is solemn trifling; and, like the tubes full of coloured fluid which the market-place quack gives his dupes to hold that he may divine from the movements he observes what malady possesses them, these experiments on excised frogs' hearts serve only to inspire those who—like Prof. Fraser—ought to know better, with an idea of the scientific eminence of those who perform them.

Nor—in spite of the *Medical Times*—is theoretical practice scientific. The germ theory of disease is not the doctor's science. Until it is proved what share micro-organisms have in disease-processes, they afford no ground for the medical man to work on, whatever interest they may have for the biologist. When Vulpian, acting on the assumption that the germ-theory is true, seeks to kill the microbe of typhoid fever in his patients suffering from that disease, he is not acting on known but on supposed conditions; his practice is not scientific but theoretical: and when, instead of the microbe, he poisons his patients, the badness of his art—and of all such art—is made apparent. And when Dr. Burdon Sanderson* says that the title of "Institutes of Medicine"—that is, the foundation of the doctor's art—"does not properly belong to the science which deals with the workings of the human body," but "really belongs to another branch of scientific inquiry, that which

* *Inaugural Address* at Oxford, *Lancet*, Oct. 20, 1883.

consists of the experimental investigation of the nature and origin of diseases, and of the external agents which either produce or counteract them," he only shows that he is completely ignorant of the proper relations between science and art, and of what scientific medical practice really is. The practice which is based on an "inquiry" instead of on known facts is experimental and not scientific. Professor Vulpian's results are a significant comment on Dr. Burdon Sanderson's wonderful doctrine.

Again: the doctor's science does not lie in an extensive acquaintance with mongrel Greek and Latin words and scientific phrases. When the editor of the *Lancet** tells us that "It is sometimes forgotten that *coughs* (sic)—properly so-called in their integrity—are convulsive, expiratory efforts intended to eject from the air-cells or passages of the lungs, or from the windpipe or larynx, either secretions or exudations, or, occasionally, foreign substances, which impede the act of respiration," we are not to infer that he is unusually scientific in his treatment of coughs, but only that he has a great facility for saying in learned jargon what everyone knows, to wit, that coughs are—coughs. Nor was that an eminently scientific practitioner who told a lay friend of mine to whom he was relating the particulars of a race-accident at which he had assisted, that an unfortunate person had sustained a fracture of the clavicle, adding, "*There are three thirds in the clavicle*, you know, and this took place in the middle one!" I can match these two, in scientific value, with the saying of an old dame who came to my hospital clinic. She wished to consult me about her daughter whom she had brought. I asked her if the patient had lost flesh since her illness began; upon which she broke out with this: "O, no! Sir. I only wish she had! *It doesn't play on the constitution if it touches the flesh!*" The worthy old lady had observed a fact,—or had imagined she had,—and she translated that fact—or supposed fact—into theoretical and, as far as she knew how, scientific language. In other circumstances she might have edited another *Lancet* with no little success.

* Dec. 15, 1883.

III.

It is sometimes said that the science of medicine is made up of many sciences—physics, chemistry, botany, zoology, normal and abnormal anatomy and physiology, and materia medica. This is not the case. The science needed by the medical man partakes of these sciences to a greater or less extent, but it is not identical with any or all, and it includes many things of which these take no note. Now that the doctor no longer collects his own herbs he makes no use of botany in his practice, however desirable it may be for his intelligence that he should know it : the botanical characters of a plant are altogether different from its powers over the human body. Again, however necessary it may be for a professor of physiology to know all the various theories advanced to explain Development, this knowledge is of little service to the doctor when he comes to the bedside of the sick. What it is necessary for him to know is, the facts of anatomy and physiology—morbid and healthy—so far as to be able to form a true conception of the condition of his patient, and to know the external conditions that are capable of influencing him either for good or evil. This is the twofold science the medical man needs to enable him to practise his twofold art with success.

Imagine a modern neophyte placed by the side of a sick-bed along with Sydenham in his prime. The latter would not be able to pass a modern examination in elementary science ; he would be a stranger to the atomic theory and the germ theory alike ; he would know nothing of bathybius, protoplasm, embryology, or evolution : and yet, what sane person would not prefer Sydenham's opinion as to the state of the patient, the gravity of the case, and the likelihood of recovery to that of the modern tiro ? True, he would not, if the case were obscure, be able, like the latter, to utter with an air of profundity the words "neurosis" or "vaso-motor"; and he might not give the condition the name by which it is now generally known ; but in all the essentials of the diagnostic science and art he would be immeasurably the other's superior. In regard to the art of

Healing there might not be much difference. Treatment has always been founded almost entirely on theories of disease, and Sydenham, doubtless, often lessened his patient's chance of recovery by employing blood-letting on the supposition that it was necessary to employ an "antiphlogistic": but Sydenham did not poison his patients with carbolic acid under the impression that he was killing microbes.

I said it was necessary for the doctor to know the *facts* of anatomy and physiology. Here is the point where a great deal of the confusion begins. The object of the student of science is to get at facts through phenomena. This is right and necessary. The mistake made by modern teachers in the medical schools is, that they do not recognise what are the facts with which we must be content. In all the concrete sciences, and especially the sciences which deal with life, the *ultimate* fact of any phenomenon, or group of phenomena, we can never reach. In physics we may recognise the existence of the force of gravity, but we must acknowledge that the force itself is a mystery to us. In all the sciences which are concerned with living things the complexity is much greater. There is a factor which we can never fully estimate; and until we are honest with ourselves and acknowledge this to be so, we must inevitably fall into error. At this point medical thought divides into two streams. One set of thinkers deny the existence of any such unmeasurable factor. "There is no more mystery in living bodies than there is in a steam-engine," said a teacher of physiology to his class not many months ago. The other class, recognising the existence of the unknown force, think that since it is unknown and not to be weighed and measured, they may in their calculations ignore its existence. Both sets of thinkers are illogical and unscientific. There is a difference between a piece of living protoplasm and the same protoplasm the moment life has left it. Until men of science have explained what that difference is, it is folly alike to deny or ignore its existence.

But if the life-force is unknown in its essence it is not unknown in its manifestations. We have these for our guidance, and these constitute the basis facts of our science.

It would be much more satisfactory to the scientific type of mind if the explanation of these facts were to be reached; it would be much more satisfactory if we could see all that takes place in the inner workings of the economy when a person takes cold; but, until the mystery of the invisible life-force is solved, the phenomena are themselves our facts: the chill, the fever, the catarrh, the malaise,—the knowledge of these constitutes our science. If we frame an explanation of the inner power, and then prefer our explanation to the phenomena sought to be explained, we are not scientific but the reverse. And again, if we are not content to know that certain drugs have certain powers over different parts of the body, but must wait until we have found some theory satisfactory to ourselves of their peculiar power and affinity before we use them, we are not following the dictates of true science. And yet the search for these explanations of the inexplicable are now regarded as the highest aim of what is called medical science. It is this that is leading men to perform dreadful experiments on living animals, although they differ in unknown ways and degrees in their anatomy and physiology from man. It is these that are held up to the student for his admiration as constituting genuine science and the glory of the medical profession.

And what is the result of this teaching? I happen to be able to gauge it pretty accurately in my own case. In my pupilage, before joining my university, I remember that I had an idea that the purpose of my life was to be the healing of the sick. In a small way, I felt that I was able to do something of the kind, even at that early stage, under the eye of my elders. I had a notion, also, that the limited extent of my powers was chiefly due to the fact that I could only in a very slight degree understand the phenomena that came before me. I could recognise a number of disorders, but I did not understand the *rationale* of them. I thought that when I should attain to this it would enable me to do much more for my patients.

A few years later I was present at a meeting of a society of medical students of which I was a member, where a paper was read on the subject of "Therapeutics." By dint

of much study, I had, by this time, become fairly proficient in a number of sciences, and I can measure the effect the teaching had had on myself by remembering the astonishment, which I shared with the majority of those present, when the reader of the paper made this remark: "After all, therapeutics—the curing of his patients—is the chief end of the doctor's calling."—I had come to believe that the chief end of the doctor was to be able to give a scientific explanation of anything and everything connected with the sick!

Another result of the exaltation of what is supposed to be science in the course of medical training is seen in the newly-qualified when first thrown on their own resources. Most men, I take it, will remember experiencing at that moment—unless a long course of post-graduation practice in house-surgeonships have given them confidence—a dreadful sense of helplessness,* which only diligent exercise of their faculties in dealing with the sick has sufficed to wear off; and the exigencies of life,—the responsibility which cannot be escaped,—if no higher cause, soon compel this diligence. But when the newly-qualified accepts some subordinate post, where responsibility is reduced to a minimum, the real effects of the glorification of science in medical training is more plainly exhibited. The word you most frequently hear from him is the word "interesting." His work is "interesting;" the cases are "interesting;" a very dangerous case is "extremely interesting;" it affords boundless scope for his highly developed talent for weaving explanatory theories—the chief aim of his life—with the result of which, however, patients are ungrateful enough

* This is not always the case, as an incident related to the writer will serve to show. A licentiate of a northern medical college of no very high repute, the day after his "qualification" had been conferred upon him, appeared as formerly in the hospital wards in the train of the clinical professor. The latter, forgetting the mystic change that had come over the youth within the previous twenty-four hours, questioned him as usual about the cases, and, as usual, when he made a foolish mistake, rebuked him with professorial severity. Stung to the depths of his professional pride, the new-born licentiate floored his professor with this retort: "Well, I think I may be allowed an *opinion*, seeing I am now a *qualified man!*"

not to be satisfied. Happily, the seniors under whom he works have had their feeling of "interest" in the cases mastered by another sentiment; and when our neophyte comes to solicit the favours of a suffering public, he himself soon finds that the interestingness of his patients is not the main consideration.

But though his manner of regarding and dealing with patients undergoes a radical change under the wholesome pressure of responsibility, his belief in his powers of curing them does not, as a rule, grow stronger. When a patient asks to be cured the reply of Young Physic is this: My dear fellow, do not be unreasonable; we know a great deal more about your disease than we did formerly; we can tell you exactly what centres are deranged—at least, we think so—and "we must be able to avert" your disorder better next time; we must "tend to treat diseases better"—and your disease among them—"if any such action be possible." I am not going to give you drugs; you have had the comfort of having your disease explained to you most scientifically. Unfortunately our pharmacologists have not yet explained drug-action satisfactorily, and the scientific physician "wants a reason why, before he gives a drug." "The monition of the best medicine of to-day" is: "Amend the life according to biological laws, repent of physiological transgressions, and throw physic to the dogs." These are the sentiments of Dr. H. Donkin, expressed in an introductory address delivered by him at the London School of Medicine for Women in October last.* This is the hopeful—and natural—outcome of the teaching which regards theoretical explanations of drug-action and disease as of greater scientific importance than the facts.

So far from this being genuinely scientific teaching it is the very negation of science. It would be as wise on the part of a natural philosopher to disregard the phenomena connected with the force of gravity until he had satisfactorily explained what that force was, as it is for the physician to refuse to utilise the powers of drugs until he has found an explanation of them satisfactory to himself. It is

* *Medical Times and Gazette*, Oct. 6, 1883.

impossible to conceive the difference it would make to medical practice if students were clearly shown that their business in life is to be not scientists, but practitioners of an art; that their art must always keep on a level with their science—their knowledge never be too great for them to be able to utilise; that as practitioners of medicine, physiological and pathological investigations, apart from clinical and post-mortem observations, are no business of theirs; that all their scientific acquirements are only valuable—apart from any beneficial influence they may have on their general intelligence—in so far as they minister to their understanding of their own peculiar science—the knowledge of the constitution of the human organism and all that can influence it for good or evil. The true end to set before students is the acquirement of an art. They should be shown that this depends altogether on themselves; that the condition on which they may have it is—patient, self-denying, honest practice. And not only is this the sole way of their acquiring proficiency in their art, it is the only true way of advancing their proper science. Art always has preceded science, and always must. The men who have done most for the science of the medical practitioner are those who have most devotedly cultivated his art. Who has served the cause of science best, Trousseau or Claude Bernard? Jonathan Hutchinson or Burdon Sanderson?

The medical practitioner is an artist first and last. He is only a scientist in so far as science ministers to the practising of his art. The twofold art he professes is a noble art. The very difficulties that beset the attainment of proficiency in its practice confer on it nobility by the qualities called out to surmount them. There is no royal road. The scientists, with their explanations and simplifyings, have not yet succeeded, and never will succeed, in reducing the doctor's art to something like the working of a Babbage calculating machine. This is what they seem to mean when they talk of "reducing"—or "elevating"—an art to a science. In spite of all their efforts—let Science advance to what height of sublimity she may—they will never succeed in turning out into the world ready-made Syden-

hams after a four or five years' course of study. Sydenhams are not made in the schools; they are made by their own honest, unpretentious, self-devoted practice of the art they profess. The true function of the schools is to put the students in the way of doing this; to show them that on themselves depends whether they succeed or fail; to encourage them manfully to meet the difficulties that beset their endeavours to render themselves helpful and efficient at the bedside of the sick. A few years of work of this kind will confer no mean degree of proficiency in his art on him who gives himself up to it, and will lay the only foundation for future advance. Perfect mastery in this art of arts a whole lifetime is too short in which to attain. The devotion of a life is not enough to confer this; and nothing short of a life's devotion is demanded for the acquirement of high proficiency. The dilettante has no place among the worthy professors of the Doctor's Art:

> "The track our venturous keel must furrow brooks
> . . . no self-sparing pilot."