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Skepticism in Medicine: Past and Present

Maurice Raynaud, M.D.

Being invited to address this great assembly on the subject of skepticism in medicine is a very great honor. But addressing physicians from every sector of the civilized world presents a perilous mission as well as a unique opportunity. Why? Because your presence appears to reflect *faith* in the progress of our art, not skepticism. Does my topic then fly in the face of what these circumstances actually demand? Indeed, it might seem that way. But survey contemporary medical practice, if you will, and see whether my subject is relevant. I doubt that you will answer "no." Thus, my address will not be delivered in alien terms. If we shall see that skepticism is an enemy, it is no imaginary enemy.

Gentlemen, I do not say that we believe *less* in medicine than did our fathers. Rather, I say that we believe in a *different way* that raises interesting questions. Within this context I shall therefore explore an intriguing area which, like so many others, has evolved within that mentality termed (rightly or wrongly) "the modern mind."

First, let us try to understand what the word "skepticism" means. The term designates two usages which should always be carefully distinguished. On the one hand, "skepticism" refers to that philosophic system which denies the foundations of certainty. On the other, it refers to an intellectual tendency, to a fashion of the mind, which originates in habit (or in education, or in reasoning) and which leads, more or less, to universal doubt. Coexistence of these two attitudes within individual intellects should not surprise us, although they certainly need not coexist.

I shall say nothing about the philosophic system because our setting does not favor this consideration. But if we are to rely on etymology, we must note that *σκέπτομαι* does not mean "to doubt" but, instead, means "to examine." Confusion here has been established by a veritable abuse of language brought about primarily by the skeptics themselves. To doubt is to adopt an excellent disposition for examining. But why does one examine? Precisely in order to form an opinion

— that is, to allay one's doubt. If one decides to suspend judgment indefinitely and continues researching, even in the face of demonstrable truth, then commencing the study of any great question would never be worthwhile.

Thus, we are able to distinguish between good and bad skepticism. Or, better yet, between skepticism (properly so-called) and philosophic doubt, a perfectly legitimate orientation and the basis of all scientific endeavor. Skepticism is therefore not merely a system to be surrendered to quarreling academicians. No. It is a disposition that possesses practical value, especially for physicians.

We should now distinguish between this skepticism and the critical spirit which is more fully developed today than ever before. The critical spirit is most praiseworthy for it consists of exact measurements in matters of proof, of verifying even the most plausible assertions, and of considering theories as provisional landmarks around which to group facts. But the critical spirit also dictates that we abandon these landmarks whenever they are shown to be false or inadequate. Consequently, the facts emerge victorious from this ordeal of constant contact with experience.

I know that it is difficult to establish a boundary between the critical spirit and skepticism. The latter is little more than an exaggeration of the former. Indeed, the difficulty of deciding just where exaggeration begins makes it very easy to pass from one to the other. Are we able to flatter ourselves by saying that our grasp of even one group of physiological facts amounts to the final word? Yes, we can, and these facts are the foundation of our art. But how few they are! And how infinitely many remain open to research — and to doubt — facts only partially understood and partially investigated!

Up to this point things go very easily. Clearly we are not dealing with a question of authority. Regardless of what we say, authority, among us, has always been a contested and precariously situated empire, even during the era when it passed for being sovereign. In this light, let us consider the following quotation:

Medicine is a matter of knowledge, not of faith; its teachings have no value save for that which reason grants them.¹

Somewhat in defiance of Royer-Collard's axiom, I want to grant skepticism its proper province and situate its domain along the ramparts of critical inquiry.² I figuratively ask of skepticism, however, that it not invade the territory of its neighbor.

Gentlemen, understand that I shall neither survey the history of medical skepticism nor draw parallels between ancient and modern skeptics. Nor shall I place all skepticism on one side and all belief on the other. That would really be a jest, as contrary to the demands of good sense as to historical reality. There have always been skeptics and there probably always will be. Like extreme credulity, skepticism is a

perennial manifestation of the human intellect. Actually, if I had to choose between them, I would prefer skepticism, even though it is rather sterile in itself. The advantage would lie in being able to perpetuate the notion of science as being never entirely achieved. We should recognize, of course, that this is the indispensable condition for actual, though necessarily incomplete, scientific achievement.

Skepticism and credulity would seem to be antipodes. Yet daily experience demonstrates that they are, curiously, neither mutually exclusive nor irreconcilable. Indeed, this realization points toward the salient feature of that skepticism which links much of today's laity to the medical world. Forgive me, gentlemen, for touching on so peripheral a question, but I cannot pass over it entirely. Daily we encounter self-appointed wise men who inform us that medicine is a conjectural science. I always reply that if they mean a science into which conjecture enters, then *no* science escapes this reproach — astronomy, physics and chemistry not excluded. (I never mention law or political science!) Actually, the whole question hinges on *the degree* to which conjecture is employed, but no matter. These are the same people who not only ignore the first principles of medicine, but who also ask from medicine more than it can give. We have, therefore, the deceptions, the torrent of reproaches and the unending stream of jokes which we have had to endure for so long. Having had the opportunity to study and discuss the humor of Molière, I can only say that he was following a tradition as old as humor itself, yes, and as old as medicine.^{3, 4} Aristophanes, for example, irreverently gave Aesculapius the name "Scatophagos" — that is, "eater of excrement."^{5, 6} You can therefore see that this tradition is by no means of recent origin. To list medicine's detractors is to attempt the impossible because they are just too numerous.

If Physicians Were Vindictive . . .

Now if we physicians were vindictive people, we could easily react by simply exposing the blind confidence our detractors have had in empiricism, at times the grossest empiricism. Cato the Elder, for example, is said not only to have driven physicians from Rome but also to have prohibited his son from seeking their advice.⁷⁻⁹ Yet at the same time, he himself physicked his wife and slaves, not to mention his animals! This sort of thing has been commonplace throughout all of history. Madame de Sévigné provides another good example.¹⁰ She never tired of hurling sarcasms and insults at the inanity of medicine, insults even more derogatory than those of Molière, if that could be possible. But at the same time, she too bombarded her friends with innumerable absurd remedies, seeking as the only endorsement a non-medical origin.

All of this is wretched enough. But even more wretched are the realities surrounding the vicissitudes through which our art has moved. Despite the intrinsic merits of men and achievements, it is the caprices of fashion, not the progression of compelling ideas, which seem to have had the greater influence. For example, France is generally not regarded as having witnessed an age of faith during the 18th century. Still, it was during this epoch that the medical profession exercised what was perhaps its greatest influence. The memoirs of the Duke of Lévis provide an amusing picture of this high society where the ladies, in particular, generously extended boundless admiration and tender submissive confidence to those within the medical world.¹¹ Listen as the Duke, viewing the reign of Louis XIV, compares the sentiments which these ladies felt with those their grandmothers had extended to their spiritual directors.¹² He then says that this shift of affection might well be explained by the preference for the body over the soul which was so characteristic of Louis's reign!¹³ I might add this: The great ladies who listened to Tronchin, as though to an oracle, and those who flocked to hear the florid speeches of Vicq d'Azyr at the Royal Society of Medicine, were probably the very ones who crowded, even more excitedly, around the magnetizing apparatus of Mesmer!¹⁴⁻¹⁶

We hear much these days about the progress of enlightenment and I shall not belittle it. Still, if the truth were known, there would be scanty enlightenment in the area we now consider. Today we find almost everywhere the same ignorant infatuations and infantile superstitions as before. We find the same jesting and credulous mentality which believes nothing because it believes everything — the same mentality which rejects scientific medicine but unreservedly accepts table-turning, spiritualism and homeopathy; the same mentality which recognizes no rules save for those based on pure fancy.

Curiously, this mentality is to be found neither principally nor entirely among the lower classes. We discover it among the upper classes too, among the most erudite and cultivated of intellects and, sometimes, even among scientists. Understand, too, that I do not speak exclusively of France. Even sober England is not exempt from this infirmity of human nature, so I am told.

I have said enough. Forming judgments requires a judge. In this area, however, we find no competent judge. And, unfortunately, we must also confess that even medical men have set a regrettable example. Frequently we hear that it has been physicians, not philosophers nor literary men nor poets, who have vilified medicine the most. Where, for example, can one find a more cruel condemnation of therapeutics than this:

Therapeutics is an incoherent assemblage of opinions, themselves incoherent. Of all the physiological sciences therapeutics is perhaps the one most given to intellectual eccentricity. What am I saying? In no way is thera-

peutics even a science — at least not for the intellect sensitive to methodology. Instead, it is a shapeless collection of inexact ideas, of frequently puerile observations, of illusory methods and formulae — all as fancifully conceived as they are fastidiously brought together. Some say that practicing medicine is revolting. I go further and say that some of its aspects are unbecoming to any reasonable man.¹⁷

Who is expressing himself? Some obscure figure? Not at all. This is Bichat whom we all regard as one of the promoters of modern science, and rightly so.¹⁸ Further, we can locate unflattering portraits from among the great leaders of our principal schools even after excluding Broussais who flatly declared that, before his own time, “medicine only cradled men in chimerical hope, being, all in all, more hurtful than helpful to humanity.”^{19, 20} After hearing all of this, we might more readily excuse the outsiders who judge us so severely.

Now that we are immersed in medical literature, let us look into its wellsprings. Here we find that the first words written about medicine reflect discouragement and doubt: “*Ars longa, vita brevis; experientia fallax, iudicium difficile.*”²¹ This is, of course, the first aphorism of Hippocrates.²² With irony, M. Peisse has asked how Hippocrates, after considering his first, found the courage to write subsequent aphorisms!²³ Without question, his statement provides an admirable example of prudence and modesty, even though it has not always been understood to be such. Regardless, the fact is this: an indefinable affinity between medicine and skepticism seems to have existed from the very outset. Not by chance alone does the list of skeptic philosophers contain the names of so many physicians: Sextus Empiricus, Cornelius Agrippa, Sanchez of Toulouse, Martin Martinez, Leonard of Capua and others. (I am tempted to include Rabelais as well.²⁴ As a philosopher he defies classification, especially within the ranks of orthodoxy. He was a physician nonetheless and therefore belongs among us.)

Most Widely Known Physician

The most widely known of these physicians is Sextus Empiricus who bequeathed both a code and a summary of the skepticism of antiquity in his renowned *Pyrrhonian Hypotyposes*.^{25, 26} Yes, I am aware that he denied any relationship between skeptical doctrine and empirical medicine — that *necessary* relationship which others from his era professed. Instead, Sextus saw the necessary relationship existing between skepticism and methodology. (Students of his work have found this nut indeed a hard one to crack!) But this is beside the point. Important and beyond question is the fact that Sextus was a physician, as were four or five other principal skeptics such as Cornelius Agrippa who authored *De Inutilitate et Vanitate Scientiarum et*

Artium atque Excellentia Verbi Dei Declamatio, the most audacious challenge ever made to science.^{27, 28} We also find here Sanchez of Toulouse, who wrote the famous work, *Quod Nihil Scitur*.^{29, 30} Also Martin Martinez, the author of *Philosophia Sceptica*.^{31, 32} Martinez wrote treatises on both skeptical philosophy and skeptical *medicine!*³³ He was unquestionably an independent thinker, a fact that in itself was an achievement for one who breathed the air of the 18th century. But for all that, Martinez was not an ordinary skeptic since he invoked the authority of the scriptures, that of the Christian Fathers, and that of the medical greats, Sydenham and Baglivi, all, of course, in support of his own doctrine.^{34, 35} We might also mention, parenthetically, that additional support for his position came as the result of Feyjoo's treatise (attacking Lopez de Araujo) being published.³⁶⁻³⁸

Actually, the voluminous works of Martinez are nothing more than an extended plea for observation in methodology. In the style of Platonic dialogues, he attacks Hippocrates, the Galenists, the Iatrochemists, and the Cartesians, refuting each by using arguments of the others before concluding this: scientific certainty, by its very nature, is not absolute but relative. Further, he concluded that this relativity is the very condition which actually allows progress to occur. This Pyrrhonism, as you can see, scarcely exceeds that which Sprengel embraced, but no matter.³⁹ Many genuine Pyrrhonians did emerge from within the medical world, and the affinity which we are discussing has indeed existed. In fact, an important discovery identifies a current of skepticism running throughout the entire literature of medicine, a current reflected in the major work of Leonardo of Capua.⁴⁰ These eight volumes describe the origin and progress of medicine but clearly emphasize the uncertainty of it all.⁴¹ Seemingly, this physician attempted to demonstrate that medicine, *ex professo*, does not exist! I am unaware of any similar spectacle occurring within the history of any other science.

A moment ago I quoted Cornelius Agrippa. It goes without saying that he treated medicine with particular harshness in his book. But here is something which is not so well-known. Montaigne (whose name is hard to avoid when speaking of skepticism) also wrote a chapter, in his 15th book of *Essays*, entitled "On the Resemblance of Children to Their Fathers," a chapter which bitterly attacked medicine.⁴² His arrows are sharp and many of them hit their mark, we must admit. The hand of an expert is not hard to discern. But elsewhere we find one of those tricks which have made Montaigne famous. In this other book, under the pretext of an apology for the philosopher and physician, Raymond Sebond, Montaigne, who had already enrolled his hero by force in the ranks of skepticism, attributes to him some of his own exorbitant opinions.^{43, 44} He even goes one better. In many a passage

he does not scruple in copying Agrippa. Indeed, he copies him to the point of plagiarism, taking entire passages without attributing their source to him. And so, despite his own attacks of the gavel, the "disenchantment with medicine," which he claims to have inherited from his father and grandfather, found eloquent expression. Granted, the theme was already his own. Still, and ironically, it was a physician who furnished him with ammunition.

We must make qualifications, however. Studying medicine may or may not favor an emancipation of the intellect. Either way, it tends to maintain within most mentalities a certain practical good sense which, in turn, helps to guard against the great aberrations into which professional philosophers occasionally fall. Further, some of these authors seem to have judged books by the binding rather than by their contents, being doubters rather than skeptics. For example, the book by Sanchez is really nothing more than a virulent brief directed not against science in itself but, rather, against the scholastic method which was then still in vogue. We might compare it with the "Pars Destruens" of Bacon's *Organum*.⁴⁵⁻⁴⁷ In fact, Sanchez conceived his book as being the first part of a much larger work. Unfortunately, this was never completed so we are unable to form a definitive judgment.

Gentlemen, please believe that I seek to make no allusions. If agitating these old memories causes you to compare the realities of today with what has gone before, I am not to blame. We can only guess at the nature of what still lies hidden within every page of our history like a mute supernumerary. But even though our understanding is incomplete, I feel compelled at least to try distinguishing the *causes* of this evil which seems to be so inherently bound up with medical endeavor.

Need to Establish Etiology

This much we all know: etiology must be established before any good treatment can be provided. Yes, and this axiom certainly holds true in the present case. Ah, gentlemen, as to the causes of skepticism in medicine! Let me only say that some are universal and perennial. To discover them requires only a little knowledge of human nature. In fact, one of skepticism's great strengths is related to this peculiar characteristic: recourse to skepticism simultaneously flatters two deep-seated human instincts — idleness and vanity. Idleness it flatters by obviating the necessity for seeking the truth — that laborious undertaking which, like the Kingdom of God, suffers violence. Vanity it flatters by allowing us to underrate the work of others while laying simultaneously upon our own souls the flattering unction that would make us immune from common prejudice.

A form of this self-flattery lies at the root of all skepticism. However, I do *not* want to imply that *only* this lies there. Many conscientious and reflective minds have become discouraged by the uncertain results and the contradictory opinions that are involved in therapeutics. Is it therefore astonishing that so many medical men have taken refuge among the skeptics? I think not. And is not the study of medical phenomena the most complex and difficult of undertakings? I think that it is. Do we not deal with the most variable of manifestations, variable even though they all rest upon the same foundation? Is it not very difficult to set down fixed and unvarying rules which will not be invalidated by innumerable exceptions? And is all this not responsible for the multitude of conflicting medical systems which battle and collide like the crumbling empires of Bossuet?⁴⁸ I am afraid so.

After beholding this spectacle we can see that strength of mind is needed in order to resist a sense of futility in medical matters. Especially is this so when we attempt to visit the past by disturbing the dust in our libraries. Faced with that mountain of books and manuscripts, how satiated and disgusted we can become! How mediocre the end result seems to be! Perhaps we can now understand what prompted Sydenham's outburst when he was childishy questioned about the best medical book to read:

"My friend, read *Don Quixote*," replied the English Hippocrates.⁴⁹

But Sydenham was not a skeptic. He read and understood another book — the book of nature.

Let us return to the causes of skepticism. At present, as in ages past, the most fundamental and potent of these causes relates to medicine being *both a science and a profession*. About this we should not complain too much. After all, this helps to satisfy that most generous and sublime of sentiments, the need to help suffering people. This is perhaps medicine's greatest glory, although it is onerous: the demands on the professional draw heavily from the resources of the scientist but, despite all the effort, these are always inadequate. As a rule, men care little about the progress of science. However, when they become ill they do wish to recover — this is why they come to us. But amidst the presence of so many ills, our impotence becomes painfully apparent to any medical man who senses the dignity of our art. What an enormous disparity separates the patient's immense expectation from our capacity to render service! You may ask, how can this excessive confidence be justified? I simply do not know. And yet, despite everything, we must struggle and act. Science is incomplete and always will be. Never mind: we must prescribe. Granted, this is a faulty mentality in the eyes of the purely scientific — and, in some measure, they are justified. We can, in fact, become accustomed to acting by chance

and we can indeed act blindly. We can also delude ourselves about what we know and what we do not know. Thus, some spirits who are little inclined to temporize will simply fall back on doubt and inaction when presented with this prospect — as if to flaunt Comte's dictum about knowledge being power.⁵⁰ We must realize, however, that ignorance is impotence indeed.

These are the most important general reasons why medical men have gathered in large numbers behind the banner of skepticism throughout the ages. But there are more *specific* reasons why this has occurred and I now ask for your permission to consider them.

Speaking of 'Past'

First, let us speak of the past. But what does the word "past" mean? What divides the ancients from the moderns in medicine? Here we have the answer: it is England which merits the honor of having inaugurated the modern era of medical science. Daremberg has said that there are really only two great periods in medical history — that which preceded and that which has followed your great and immortal Harvey.^{51, 52} Before his time, the sick man was observed from the vantage point of symptomatology — sometimes with astonishing sagacity, true, but always from the outside. Since then, the sick man has been studied from the vantage point of function, that is, from within. Closed before, the internal microcosm at last became open for investigations. In turn, and also through Harvey, the new and fruitful notion of permanent and immutable physiological laws was introduced into science. Before Harvey, physiology was unknown. After his day, men began to learn.

Chronology must harmonize with doctrine, as you know. Yet more than half a century elapsed before the blood's circulation became incontestably accepted, half a century during which this new doctrine encountered every distressing form of skepticism, but one especially: *the refusal to examine evidence*. Furthermore, this same half century witnessed a variant of this same form of skepticism: *assaulting established fact by dialectic alone. How much talent, science and wit (especially) were wasted by those adversaries of the "circulators," as they were called!* Guy Patin is a memorable example — Guy Patin whose singularly acute mind was unfortunately closed to any fresh idea.⁵³ He regarded both the entire pharmacopoeia (antimony) and the doctrine of the blood's circulation with equal disdain. He reduced all therapeutics to blood-letting and, in so doing, furnished striking proof that skepticism and a propensity for the routine go hand in hand.

But who dares to assert that the Guy Patins are now extinct? Or that the spirit of Harvey has absolutely and universally triumphed?

Let us briefly specify another cause. *Dogmatism*, during every age, has brought about skepticism within the medical world. The narrowness and tyranny of dogmatism lead directly to doubt, especially when dogma is ajar from a solid foundation. This was much more in evidence formerly than it is now. Thus, when we probe deeply into the spirit of the ancients, what do we find? A vague and incomplete notion regarding the permanence of nature's laws. Amid hypotheses — sometimes mystical, sometimes grossly materialistic — regarding the *primum movens*, we invariably meet the idea, more or less articulated, that life is a capricious force essentially beyond the grasp of the human intellect; that with regard to life and its manifestations, the exception is almost as frequently encountered as the rule; that affirming anything about these fluctuating realities is impossible.⁵⁴

Gentlemen, is this vision so far removed from our time? Do we not often hear that “never” and “always” are words which should remain alien to the medical world where “everything” happens? Do we not hear of “untrustworthy” drugs and “uncertain” diseases? Then what we encounter within these formulations is skepticism, is it not?

Nowadays it is often said that there are no more systems; that the era of systems has passed; that we no longer believe in anything but facts. Well, on this point, I, for one, remain somewhat skeptical! In France, since the beginning of this century, we have had physiological medicine, organic medicine, and positive medicine — even positivistic medicine, which is not the same thing at all. I could cite still other medicines if I wanted to. But our pretence at severity and exactitude is by no means peculiar to this epoch. It has endured throughout the ages. Did our forefathers regard their science as being fanciful? Indeed not. They, too, proclaimed the sovereignty of experience and the universal power of facts. Here we find the bond that unites them with us, if we find it anywhere. Now I do admit that systems have lost much of their former prestige. I suspect, though, that they lie waiting to regain their lost high rank. All the same, being mindful of the ways of the past, we are therefore reluctant to include all of science within a single formula. Consequently, our present concepts have a much greater chance of being true.

You can see that I am extending all of the compliments which politeness demands. But all the same, I ask that science recognize its own characteristics, especially its own defects. It is here, within these very defects, that some of the causes of medical skepticism within the *modern* era are to be found. Let us treat these individually. First, in the equitable vernacular of good comradeship, let us refer to the abuse of science — that is, to *ignorance*. Presently, science is so vast that we must take some position or pay the penalty of being unproductive. A good example of this is that peculiar contemporary phenomenon, the eminent specialist who is otherwise absolutely ignorant. Yes, doubting

is always easier than studying. Thus, certain forms of partial skepticism, such as that universal bad habit, therapeutic skepticism, exist along well-marked avenues.

Second, doubt can result from *allowing physiology to intrude into the province of pathology*. But physiology is not medicine. The spheres are not identical. True, the tissues and organs are the same but each reacts differently when healthy and when diseased. In fact, disease itself induces certain modes of reaction which have not, as yet, been experimentally reproduced. Hippocrates asked this question: "Who, upon beholding the brain, would suspect that wine would disturb its function?" Let me ask another. Do the most precise notions about skin function teach us anything about smallpox? No, they do not. Regardless of how closely physiology and medicine become linked, one will always cast insufficient light on the other. Therefore, we should not be surprised to find many eminent physiologists absolutely skeptical when it comes to medicine. Such was Magendie who should be much forgiven since he gave to us, after all, Claude Bernard.^{55, 56}

Progress Seems to Encourage Doubt

Third, we see in certain cases that even the recent *progress in understanding pathologic anatomy* seems to have encouraged the tendency to doubt. For example, we formerly believed in the efficacy of blood-letting as treatment for cerebral hemorrhage, and in "raptus sanguineus" — an elaborate theory derived from blood-letting.⁵⁷ But the discovery of miliary aneurysm has reduced this theory to nothing and has brought the lancet to disuse.⁵⁸

So let us reply to those who hold that nothing matters in therapeutics and, also, that the recent triumphs of pathologic anatomy discredit the ancients. Replying is actually no trouble at all since these detractors conclude presumptuously and for the pleasure of superficial minds. Let us therefore tell them that pathologic anatomy has delivered proof that phthisis can be cured by establishing the possible evolution of the tuberculous follicle to cicatrization. And isn't discovering a *false* path indeed significant? Does not the patient benefit whenever we turn away from this false path? Indeed he does and you would justifiably resent my enlarging further on so obvious a refutation.

Thus far we have defined and described the disease of skepticism and have searched out its principal causes. Now we might ask about a remedy for this evil. But wait, I hear an objection: is skepticism really an evil? One that we should actually combat? Or is it instead one aspect of human nature which merits a compromise, since a triumph is beyond our reach? Dealing with this question demands real sincerity.

Here let me mention something that my own professor once said. An elderly gentleman, he had been lamenting over the impotence of our art. He advised us not to convey this judgment to the younger men since they themselves would find it out all too soon. Well, I have never taken this view. I think we should tell everyone — young and old alike — what we believe to be the truth. If the fruit of so much human labor, so many sleepless nights, so many sacrifices — if it all went for naught, we would still be duty-bound to say so. When we voluntarily embrace error, we might still embellish our position by naming it “illusion.” But when we teach error to others as though it were truth, its name can only be “falsehood.”

But who says we have arrived at this impasse? What a protest would arise if I should hazard such a claim! The very negation of that system which leads to ignorance in pathology and inaction in therapeutics is you, gentlemen, you yourselves! We should therefore combat skepticism. But how? Let us now look for ways to resist this baneful tendency, for ways of enlarging our capacity to believe.

We shall find, now more than ever before, the remedy for skepticism *within science*, every day better investigated and better understood. Unceasing scientific progress will bring the corrective to its own wanderings and the answer to its own postulates. Every theoretical advance brings with it, sooner or later, a practical advance — frequently when it is least expected. But proclaiming the merits of exact science is not enough. Every science contains both certain and uncertain elements. Nor does speaking ill of systems suffice. Have not the most famous of systematizers been the most ardent decriers of alien systems? They have, indeed. Nor can we build an edifice on the apparently solid foundation of pathological anatomy alone. Long before our own illustrious master, Bouillaud, took Bichat’s phrase (“What good is observation if we ignore where the trouble is situated?”) for his epigraph, Celsus had asked: “How shall we treat a diseased organ if we do not understand its workings?”⁵⁹⁻⁶²

The solution is this: we must foster a mentality congenial to the truth, a mentality which springs from assent to the following axioms:

1. The laws which regulate life are absolutely constant.
2. The multiplicity of phenomena must be rigorously subordinated in terms of conditions which then will be determined.

Claude Bernard called this last law “determinism,” a rather barbarous term so open to criticism that he himself elected, at times, not to use it. But if the word is open to objection, the reality it reflects is not so vulnerable. Therefore, this approach is ultimately projected not as a system but as the very essence of the scientific spirit.

I need not recount the ways in which Bernard himself followed this approach. Nor need I point out the vast number of potential applications within the field of pathology save, perhaps, for some very brief

examples. Some years ago, locomotor ataxia was misclassified within the vague group of diseases known as "paraplegiae." Neither its cause nor its character was understood. Consequently, it was treated randomly and, as it happened, some patients were cured — although these people evidently were not truly ataxic. This era constituted the first stage, "the period of ignorance." Then came the era of pathologic anatomy when the lesion was discovered and recognized to be incurable. We might call this "the period of discouragement." Finally, there emerged the third stage when many (not all) cases were found to be amenable to arrest (if not to cure) by specific treatment.

A second striking example is found among the virulent infectious diseases. When the study of spontaneous generation uncovered that world of infinitely small organisms which seem to besiege us on all sides, this question could have been asked: how can animals (and humans) resist these myriads of invisible enemies which are ever ready to profit from the organism's slightest failure? But Lister, the great surgeon and thinker, has established a new method for reducing the chance of infections during major operations.⁶³ Consequently, we are assured of almost infallible success where there would previously have been only failure.

A third example is provided by my illustrious friend, Louis Pasteur.⁶⁴ Genius that he is, Pasteur has advanced the work begun by your great Jenner and has inaugurated prophylaxis against virulent diseases by systematically attenuating morbid poisons.⁶⁵ Because of these developments, new and infinite horizons stretch before us.

Room for Skepticism?

Is there room for skepticism in the face of results such as these? Gentlemen, *too much enthusiasm* is what we should seemingly be on guard against! As for the skeptics, this is how we might reply to them: progress does not demonstrate itself, it shows itself. Still, let us never forget the axiom of ancient medicine (at times rather laughed at) which has survived all dogmatic revolutions, the *natura medicatrix* of Hippocrates. To me, its value is as great as that of the most incontestable, experimentally determined fact — although, to be sure, the interpretations some have given it are indeed contestable. But if men have tried so diligently (and ineffectively) to explain it, they have done so because the fact itself is beyond contradiction. I recently remarked at the Academy of Medicine that Pasteur sought to measure the progressive attenuation of morbid poisons by taking the resistance opposed by sheep as a criterion. Then, a certain virus killed one sheep in 50 while another killed 50 of 100 sheep. What does this mean? It means that this great observer has allowed "receptivity" to emerge

into focus. Yes, but what is "receptivity" if not the force of resistance which exists in every living creature, differing only in the species and the individual? Is not this the same thing as *natura medicatrix*? I think so. Whatever, it remains one of the ruling facts of medicine. This force of vital resistance, this greater or lesser degree of disease receptivity — this reality will always be the indispensable auxiliary of the physician. I personally would abdicate practice of the art were I not supported by this ally.

Of course, assigning a fair share of awareness to *natura medicatrix* is difficult, just as it is difficult to blend it with the other two axioms we have mentioned. But if interpreting morbid phenomena is difficult, it is not impossible. Regardless of how arduous our achieving this balance may seem, rest assured that we can do it. Thus, when pathologic anatomy is combined with an understanding of this great force, and when it is further combined with a knowledge of etiology, then pathologic anatomy no longer amounts to a meditation upon death. Instead it becomes the science of indications, a set of profoundly wise axioms that are perennially responsive to the living realities of the art.

When certainty in these three areas is achieved, science will then be nearly perfect. But until that happens we are not totally disarmed. Even now we have the appeals to both tradition and empiricism. Would any of us dispense with these supports? No indeed. They give us, for want of anything better, a kind of certainty which is quite valuable. Yet they do not deter our search for a more secure certainty. Yes, the medical patrimony bequeathed by each generation is composed of valuable things — some relative, some absolute. From our predecessors we have received opium, chincona, and nearly all of our best drugs; these have rendered immense service, just as they will continue to do, long before their mode of action becomes understood. Our generation will, in turn, leave chloroform, chloral, carbolic acid, the salicylates, pilocarpine and many other substances. Future generations will then clarify their action. Thus are formed "practical certainties," as Cabanis so aptly names them.⁶⁶

We therefore arrive, after all, at a kind of certainty which is adapted to the needs of the clinician. This form of certitude resembles moral certitude in many respects and merits a parallel rank, even though it does not equal the certitude of the scientist.

For a fitting conclusion, gentlemen, allow me to quote a passage from the greatest work of Claude Bernard. I can do no better than to leave you influenced by these simple but potent words:

The skeptic disbelieves in science and believes in himself: he believes enough in himself to dare deny science and to assert that it is not subject to definite fixed laws. The doubter is a true man of science; he doubts only himself and his interpretations, but he believes in science; in the experimental sciences, he even accepts a criterion or absolute scientific principle.⁶⁷

REFERENCES

1. Here Raynaud appears to be paraphrasing rather than quoting directly from the words of Royer-Collard.
2. Hippolyte Royer-Collard (1802-1850) is probably the author referred to. A student of cells, nutrition, body size and alcoholism, he was also a trenchant commentator on the contemporary medical scene.
3. Jean Baptiste Poquelin (1622-1673) was the greatest exponent of French dramatic comedy. In several immortal plays he satirized physicians and the medical world in general.
4. Raynaud, Maurice, *Les Médecins au Temps du Molière* (Paris: Didier Et Cie, 1862). A second edition was printed in 1863.
5. Aristophanes (c.450-c.388) was the greatest exponent of Greek dramatic comedy.
6. Aesculapius was the son of Apollo and of the nymph, Coronis. The Greek god of medicine, he was slain by Zeus who feared he might render all men immortal.
7. Marcus Porcius Cato (234-149 B.C.) was a Roman statesman.
8. Cato's eldest son was unnamed.
9. For an account see Plutarch, *The Lives of the Noble Grecians and Romans* Great Books of the Western World Series, Vol. 14, p. 288.
10. Marie De Robutin-Chantal Sévigné (1626-1669) was an influential literary innovator.
11. Gaston Pierre Marc (1764-1830) was Duc de Lévis.
12. *Souvenirs et portraits, 1780-1789, Bibliothèque des mém. rel. hist. de France, 1847-1881*, Vol. 14, p. 392.
13. *Loc. cit.*
14. Theodore Tronchin (1709-1781), a pupil of Boerhaave, was physician to Voltaire.
15. Felix Vicq d'Azyr (1748-1794), a sensualist, was secretary of the French Royal Society of Medicine.
16. Franz Anton Mesmer (1743-1815) was an Austrian mystic and physician who became convinced that there were magnetic and healing powers in his own hands. Forced to flee Vienna, he settled in Paris during 1778. There, a practice flourished for several years.
17. Bichat, Xavier, *Anatomie générale, appliquée a la physiologie et a la médecine* (Paris: 1801), Tome 1, pp. xlvi-xlvii.
18. Marie Francois Xavier Bichat (1771-1802) it was who enlarged upon the exclusive study of organs by inaugurating the systematic study of tissues.
19. Francois Victor Joseph Broussais (1772-1838) was a proponent of "physiologic medicine" and of the view that gastroenteritis underlies all the manifestations of disease.
20. Here Raynaud appears to be paraphrasing Broussais. There is, however, no question that a skeptical thread is woven throughout the works of Broussais.
21. "Science is long and life is short; experiment is dangerous and judgment is difficult." (See John Chadwick, *The Medical Works of Hippocrates* [Oxford: 1950], p. 148).
22. Hippocrates of Cos (457-355 B.C.) was the archetype and the greatest of physicians.
23. Jean Hippolyte Peisse (1803-1880) was a penetrating commentator on all aspects of the contemporary French medical scene.
24. Francois Rabelais (1483-1553) was cleric, lecturer (at Montpellier) on Hippocrates and Galen, and author of the immortal satires, *Gargantua* and *Pantagruel*.

25. Sextus Empiricus (c.200 A.D.) was the Greek who gave the name "Skepsis" to the teaching which had been passed down, orally, from Pyrrho of Elis (c.360-c.270 B.C.), the archetypal skeptic.
26. "Outlines of Pyrrhonism."
27. Cornelius Agrippa von Nettesheim (1486-1535) helped to revive skepticism during the Renaissance.
28. "On the Uselessness and Vanity of Science and Art" and also, "On the Great Value of Promulgating God's Word."
29. Francisco Sanchez (1550/1552?-1623), the most technical exponent of philosophical skepticism in the 16th century, was a professor of medicine.
30. "Why nothing can be known."
31. Martin Martinez (1684-1734) was professor of anatomy at Seville and physician to the King of Spain.
32. "*Filosofia sceptica, extracto de la fisica antiqua y moderna, recopilada en dialogos entre un aristotelico, galenista, y sceptico*," 1730 ("Skeptical Philosophy, Summarized from Ancient and Modern Practice, Structured in Dialogues with an Aristotelian, a Cartesian, a Galenist, and a skeptic."
33. "*Medicina sceptica y cirugia moderna, con un tratado de operaciones chirurgicas*," 1722 ("Skeptical Medicine and Modern Surgery, with a Treatise on Surgical Operations").
34. Thomas Sydenham (1624-1689) was the English physician who re-established clinical medicine on the foundation of observation and personal experience.
35. Georgio Baglivi (1668-1707), was the archetypal iatrophysicist and one who, in Castiglione's words, was "the master of Italian clinicians."
36. Benito Jeronimo Feyjoo y Montenegro (1676-1764) was Benedictine monk, scholar, essayist, and professor of theology at Oviedo.
37. "*Carta apologetica de la 'Medicine sceptica' del doctor Martinez*," 1725 ("Letter in Defense of Doctor Martin Martínez's 'Skeptical Medicine'").
38. Bernardo Lopez de Araujo y Azcarraga (?-?), was an obscure physician who functioned in the royal hospitals of Madrid. He became one of Martinez's earliest medical opponents when he published the treatise, "*Centinela medico-aristotelica contra scepticos*," 1724 ("Aristotelian-physician's Sentinel Against the Skeptics").
39. Kurt Sprengel (1766-1833) was an erudite historian whose work correlated medical developments with political events.
40. Leonardo di Capua (1617-1695) was the Capuchin friar (minor) who was one of the founders of the Accademia degl' Investiganti (the "Academy of Investigators").
41. *Parere del Signor Lionardo di Capoa, divisato in otto ragionamenti, ne quali partitamente narrandosi l'origine, e'origine, l' progresso della medicina chiaramente l'incertezza della medesima se fa manifesta*, 1681. (An English translation by John Lancaster entitled *Uncertainties of the Art of Physick* was published in London in 1684.)
42. Michel de Montaigne (1533-1592) was the first to use the word "essay" and was a master of this literary form.
43. *In Defense of Raymond Sebond*, 1580.
44. Ramon Sabunde (?-1436) was an obscure Spaniard who, in 1436, completed his major work, *Liber Creaturarum*, later referred to as "Natural Theology."
45. The part containing criticism designed to destroy the validity of all other methods.
46. Francis Bacon, Lord Verulam (1561-1626), was the English philosopher who championed the accumulation of facts and desirability of inductive reasoning in determining the laws which govern natural phenomena.
47. *Novum Organum* ("New Method"), 1620. This work was so named in order to emphasize Bacon's opposition to Aristotle's logical works which, for so long, had borne the general title, "Organon."

48. Jacques Benigne Bossuet (1627-1704) was a Catholic bishop, historian and orator.
49. The title given to Sydenham by his English contemporaries.
50. Auguste Comte (1798-1857) was the French positivistic philosopher who named and established the basic social science of sociology.
51. C. V. Daremberg (1817-1872), an eminent French historian of medicine, was the author of the classic study, *Histoire des science médicales*, 1870.
52. Sir William Harvey (1578-1657) was the author of the treatise, *Exercitatio anatomica de motu cordis et sanguinis in animalibus*, 1628, which established the fact that in man and the higher animals, blood circulates.
53. Guy Patin (1601-1672) was the leader of the Medical Faculty of Paris and a commentator about the Paris Faculty scene.
54. *Primum movens* means "starting point."
55. Francois Magendie (1783-1855) was an anti-vitalist who established the need for basing physiological research on experimentation.
56. Claude Bernard (1813-1878) is the foremost figure in the history of experimental physiology.
57. "Raptus sanguineus" was a sudden, violent drawing off of blood.
58. J. M. Charcot (1825-1893) and C. Bouchard (1837-1915), "*Nouvelles recherches sur la pathogenie de l'hémorragie cérébrale*," *Archives physiologie normale et pathologique*, 1868, pp. 110-127.
59. Jean Baptiste Bouillaud (1796-1881) was the author of *Essai sur la Philosophie Médicale* (Paris: 1856).
60. Here Raynaud — but not Bouillaud — slightly misquotes Bichat who wrote, "... if we ignore where the trouble lies." See Bichat, *op. cit.*, Tome 1, p. XCIX; also, Bouillaud, *op. cit.*, p. 147.
61. Aulus Celsus (?-?) was a resident of Rome during the beginning of the Christian era, and was the greatest of the physicians who wrote in Latin. His major work, *De artibus*, contains not only medical considerations but also those of agriculture, military art, rhetoric, philosophy, and jurisprudence as well.
62. *Traité de médecine*. Traduction nouvelle par A. Védrenes (Paris: 1876), p. 27.
63. Joseph Lord Lister (1827-1912) was the first to employ systematic antiseptics during surgical procedures.
64. Louis Pasteur (1822-1895) is the most important figure in the history of medical bacteriology.
65. Edward Jenner (1749-1823) carried out the first systematic immunization, as described in his book, *An Inquiry into the Causes and Effects of the Variole Vaccinæ*, 1798.
66. Pierre Jean George Cabanis (1757-1808) was an influential medical philosopher whose reflections on certitude were published as *Du degré de certitude de la médecine*, 1797.
67. See *An Introduction to Experimental Medicine* (Dover Ed., 1957), p. 52.