The Experimental Novel

In my literary essays I have often spoken of the application of the experimental method to the novel and to the drama. The return to nature, the naturalistic evolution which marks the century, drives little by little all the manifestation of human intelligence into the same scientific path. Only the idea of a literature governed by science is doubtless a surprise, until explained with precision and understood. It seems to me necessary, then, to say briefly and to the point what I understand by the experimental novel.

I really only need to adapt, for the experimental method has been established with strength and marvelous clearness by Claude Bernard in his *Introduction à l'étude de la médecine expérimentale*. This work, by a savant whose authority is unquestioned, will serve me as a solid foundation. I shall here find the whole question treated, and I shall restrict myself to irreproachable arguments and to giving the quotations which may seem necessary to me. This will then be but a compiling of texts, as I intend on all points to entrench myself behind Claude Bernard. It will often be but necessary for me to replace the word *doctor* by the word *novelist*, to make my meaning clear and to give it the rigidity of a scientific truth.

What determined my choice, and made me choose *L'Introduction* as my basis, was the fact that medicine, in the eyes of a great number of people, is still an art, as is the novel. Claude Bernard all his life was searching and battling to put medicine in a scientific path. In his struggle we see the first feeble attempts of a science to disengage itself little by little from empiricism, and to gain a foothold in the realm of truth, by means of the experimental method. Claude Bernard demonstrates that this method, followed in the study of inanimate bodies in chemistry and in physics, should be also used in the study of living bodies, in physiology and medicine. I am going to try and prove for my part that if the experimental method leads to the knowledge of physical life, it should also lead to the knowledge of the passionate and intellectual life. It is but a question of degree in the same path which runs from chemistry to physiology, then from physiology to anthropology and to sociology. The experimental novel is the goal.

To be more clear, I think it would be better to give a brief résumé of *L’Introduction* before I commence. The applications which I shall make of the texts will be better understood if the plan of the work and the matters treated are explained.

Claude Bernard, after having declared that medicine enters the scientific path, with physiology as its foundation, and by means of the experimental method, first explains the differences which exist between the sciences of observation and the sciences of experiment. He concludes, finally, that experiment is but provoked observation. All experimental reasoning is based on doubt, for the experimentalist should have no preconceived idea, in the face of nature, and should always retain his liberty of thought. He simply accepts the phenomena which are produced, when they are proved.

In the second part he reaches his true subject and shows that the spontaneity of living bodies is not opposed to the employment of experiment. The difference is simply that an inanimate body possesses merely the ordinary, external environment, while the essence of the higher organism is set in an internal and perfected environment endowed with constant physicochemical properties exactly like the external environment; hence there is an absolute determinism in the existing conditions of natural phenomena; for the living as for the inanimate bodies. He calls determinism the cause which determines the appearance of these phenomena. This nearest cause, as it is called, is nothing more than the physical and material condition of the existence or manifestation of the phenomena. The end of all experimental method, the boundary of all scientific research, is then identical for living and for inanimate bodies; it consists in finding the relations which unite a phenomenon of any kind to its nearest cause, or, in other words, in determining the conditions necessary for the manifestation of this phenomenon. Experimental science has no necessity to worry itself about the "why" of things; it simply explains the "how."

After having explained the experimental considerations common to living beings and to inanimate, Claude Bernard passes to the experimental considerations which belong specially to living beings. The great and only difference is this, that there is presented to our consideration, in the organism of living beings, a harmonious group of phenomena. He then treats of practical experiments on living beings, of vivisection, of the preparatory anatomical conditions, of the choice of animals, of the use of calculation in the study of phenomena, and lastly of the physiologist’s laboratory.
Finally, in the last part of L’Introduction, he gives some examples of physiological experimental investigations in support of the ideas which he has formulated. He then furnishes some examples of experimental criticism in physiology. In the end, he indicates the philosophical obstacles which the experimental doctor encounters. He puts in the first rank the false application of physiology to medicine, the scientific ignorance as well as certain illusions of the medical mind. Further, he concludes by saying that empirical medicine and experimental medicine, not being incompatible, ought, on the contrary, to be inseparable ones from the other. His last sentence is that experimental medicine adheres to no medical doctrine nor any philosophical system.

This is, very broadly, the skeleton of L’Introduction stripped of its flesh. I hope that this rapid expose will be sufficient to fill up the gaps which my manner of proceeding is bound to produce; for, naturally, I shall cite from the work only such passages as are necessary to define and comment upon the experimental novel. I repeat that I use this treatise merely as a solid foundation on which to build, but a foundation very rich in arguments and proofs of all kinds. Experimental medicine, which but lisps as yet, can alone give us an exact idea of experimental literature, which, being still unhatched, is not even lisping.

The first question which presents itself is this: Is experiment possible in literature, in which up to the present time observation alone has been employed?

Claude Bernard discusses observation and experiment at great length. There exists, in the first place, a very clear line of demarcation, as follows:

The name of observer is given to him who applies the simple or complex process of investigation in the study of phenomena which he does not vary, and which he gathers, consequently, as nature offers them to him; the name of experimentalist is given to him who employs the simple and complex process of investigation to vary or modify, for an end of some kind, the natural phenomena, and to make them appear under circumstances and conditions in which they are not presented by nature.

For instance, astronomy is a science of observation, because you cannot conceive of an astronomer acting upon the stars; while chemistry is an experimental science, as the chemist acts upon nature and modifies it. This, according to Claude Bernard, is the only true and important distinction which separates the observer from the experimentalist.

To determine how much observation and experimenting there can be in the naturalistic novel, I only need to quote the following passages:

The observer relates purely and simply the phenomena which he has under his eyes. . . . He should be the photographer of phenomena, his observation should be an exact representation of nature. . . . He listens to nature and he writes under its dictation. But once the fact is ascertained and the phenomenon observed, an idea or hypothesis comes into his mind, reason intervenes, and the experimentalist comes forward to interpret the phenomenon. The experimentalist is a man who, in pursuance of a more or less probable, but anticipated, explanation of observed phenomena, institutes an experiment in such a way that, according to all probability, it will furnish a result which will serve to confirm the hypothesis or preconceived idea. The moment that the result of the experiment manifests itself, the experimentalist finds himself face to face with a true observation which he has called forth, and which he must ascertain, as all observation, without any preconceived idea. The experimentalist should then disappear, or rather transform himself instantly into the observer, and it is not until after he has ascertained the absolute results of the experiment, like that of an ordinary observation, that his mind comes back to reasoning, comparing, and judging whether the experimental hypothesis is verified or invalidated by these same results.

The mechanism is all there. It is a little complicated, it is true, and Claude Bernard is led on to say:

When all this passes into the brain of a savant who has given himself up to the study of a science as complicated as medicine still is, then there is such an entanglement between the result of observation and what belongs to experiment that it will be impossible and, besides, useless to try to analyze, in their inextricable mélangé, each of these terms.

In one word, it might be said that observation “indicates” and that experiment “teaches.”
Now, to return to the novel, we can easily see that the novelist is equally an observer and an experimentalist. The observer in him gives the fact as he has observed them, suggests the point of departure, displays the solid earth on which his characters are to tread and the phenomena to develop. Then the experimentalist appears and introduces an experiment, that is to say, sets his characters going in a certain story so as to show that the succession of facts will be such as the requirements of the determinism of the phenomena under examination call for. Here it is nearly always an experiment "pour voir," as Claude Bernard calls it. The novelist starts out in search of a truth. I will take as an example the character of the Baron Hulot, in Cousine Bette, by Balzac. The general fact observed by Balzac is the ravages that the amorous temperament of a man makes in his home, in his family, and in society. As soon as he has chosen his subject he starts from known facts; then he makes his experiment, and exposes Hulot to a series of trials, placing him amid certain surroundings in order to exhibit how the complicated machinery of his passions works. It is then evident that there is not only observation there, but that there is also experiment; as Balzac does not remain satisfied with photographing the facts collected by him, but interferes in a direct way to place his character in certain conditions, and of these he remains the master. The problem is to know what such a passion, acting in such a surrounding and under such circumstances, would produce from the point of view of an individual and of society; and an experimental novel, Cousine Bette, for example, is simply the report of the experiment that the novelist conducts before the eyes of the public. In fact, the whole operation consists in taking facts in nature, then in studying the mechanism of these facts, acting upon them, by the modification of circumstances and surroundings, without deviating from the laws of nature. Finally, you possess knowledge of the man, scientific knowledge of him, in both his individual and social relations.

Doubtless we are still far from certainties in chemistry and even physiology. Nor do we know any more the reagents which decompose the passions, rendering them susceptible of analysis. Often, in this essay, I shall recall in similar fashion this fact, that the experimental novel is still younger than experimental medicine, and the latter is but just born. But I do not intend to exhibit the acquired results; I simply desire to clearly expose a method. If the experimental novelist is still groping in the most obscure and complex of all the sciences, this does not prevent this science from existing. It is undeniable that the naturalistic novel, such as we understand it today, is a real experiment that a novelist makes on man by the help of observation.

But see what splendid clearness breaks forth when this conception of the application of the experimental method to the novel is adequately grasped and is carried out with all the scientific rigor which the matter permits today. A contemptible reproach which they heap upon us naturalistic writers is the desire to be solely photographers. We have in vain declared that we admit the necessity of an artist's possessing an individual temperament and a personal expression; they continue to reply to us with these imbecile arguments, about the impossibility of being strictly true, about the necessity of arranging facts to produce a work of art of any kind. Well, with the application of the experimental method to the novel that quarrel dies out. The idea of experiment carries with it the idea of modification. We start, indeed, from the true facts, which are our indestructible basis; but to show the mechanism of these facts it is necessary for us to produce and direct the phenomena; this is our share of invention, here is the genius in the book. Thus without having recourse to the questions of form and of style, which I shall examine later, I maintain even at this point that we must modify nature, without departing from nature, when we employ the experimental method in our novels. If we bear in mind this definition, that "observation indicates and experiment teaches," we can even now claim for our books this great lesson of experiment.

I sum up this first part by repeating that the naturalistic novelists observe and experiment, and that all their work is the offspring of the doubt which seize them in the presence of truths little known and phenomena unexplained, until an experimental idea rudely awakens their genius some day, and urges them to make an experiment, to analyze facts, and to master them.

II

In the last century a more exact application of the experimental method creates physics and chemistry, which then are freed from the irrational and supernatural. Men discover that there are fixed laws, thanks to analysis, and make themselves masters of phenomena. Then a new point is gained. Living beings, in which the vitalists still admitted a mysterious influence, are in their turn brought under and reduced to the general mechanism of matter. Science proves that the existing conditions of all phenomena are the same in living beings as in inanimate; and from that time on physiology assumes little by little the certainty of chemistry and medicine. But are we going to stop there? Evidently not. When it
has been proved that the body of a man is a machine, whose machinery can be taken apart and put together again at the will of the experimenter, then we can pass to the passionate and intellectual acts of man. Then we shall enter into the domain which up to the present has belonged to physiology and literature; it will be the decisive conquest by science of the hypotheses of philosophers and writers. We have experimental chemistry and medicine; we shall have an experimental physiology, and later on an experimental novel. It is an inevitable evolution, the goal of which it is easy to see today. All things hang together; it is necessary to start from the determinism of inanimate bodies in order to arrive at the determinism of living beings; and since savants like Claude Bernard demonstrate now that fixed laws govern the human body, we can easily proclaim, without fear of being mistaken, the hour in which the laws of thought and passion will be formulatd in their turn. A like determinism will govern the stones of the roadway and the brain of man.

Now, science enters into the domain of us novelists, who are today the analyzers of man, in his individual and social relations. We are continuing, by our observations and experiments, the work of the physiologist, who has continued that of the physicist and the chemist. We are making use, in a certain way, of scientific psychology to complete scientific physiology; and to finish the series we have only to bring into our studies of nature and man the decisive tool of the experimental method. In one word, we should operate on the characters, the passions, on the human and social data, in the same way that the chemist and the physicist operate on inanimate beings, and as the physiologist operates on living beings. Determinism dominates everything. It is scientific investigation, it is experimental reasoning, which combats one by one the hypotheses of the idealists, and which replaces purely imaginary novels by novels of observation and experiment.

I certainly do not intend at this point to formulate laws. In the actual condition of the science of man the obscurity and confusion are still too great to risk the slightest synthesis. All that can be said is that there is an absolute determinism for all human phenomena. From that on investigation is a duty. We have the method; we should go forward, even if a whole lifetime of effort ends but in the conquest of a small particle of the truth. Look at physiology: Claude Bernard made grand discoveries, and he died protesting that he knew nothing, or nearly nothing. In each page he confesses the difficulties of his task. "In the phenomenal relations," he says, such as nature offers them to us, there always reigns a complexity more or less great. In this re-

spect the complexity of mineral phenomena is much less great than that of living phenomena; this is why the sciences restricted to inanimate bodies have been able to formulate themselves more quickly. In living beings the phenomena are of enormous complexity, and the greater mobility of living organisms renders them more difficult to grasp and to define.

What can be said, then, of the difficulties to be encountered by the experimental novel, which adds to physiology its studies upon the most delicate and complex organs, which deals with the highest manifestations of man as an individual and a social member? Evidently analysis becomes more complicated here. Therefore, if the physiologist is but drawing up his principles today, it is natural that the experimental novelist should be only taking his first steps: we foresee it as a sure consequence of the scientific evolution of the century, but it is impossible to base it on certain laws. Since Claude Bernard speaks of "the restricted and precarious truths of biological science," we can freely admit that the truths of the science of man, from the standpoint of his intellectual and passionate mechanism, are more restricted and precarious still. We are lisping yet, we are the last comers, but that should be only one incentive the more to push us forward to more exact studies; now that we possess the tool, the experimental method, our goal is very plain—to know the determinism of phenomena and to make ourselves master of these phenomena.

Without daring, as I say, to formulate laws, I consider that the question of heredity has a great influence in the intellectual and passionate manifestations of man. I also attach considerable importance to the surroundings. I ought to touch upon Darwin's theories; but this is only a general study of the experimental method as applied to the novel, and I should lose myself were I to enter into details. I will only say a word on the subject of surroundings. We have just seen the great importance given by Claude Bernard to the study of those interorganic conditions which must be taken into account if we wish to find the determinism of phenomena in living beings. Well, then! In the study of a family, of a group of living beings, I think that the social condition is of equal importance. Someday the physiologist will explain to us the mechanism of the thoughts and the passions; we shall know how the individual machinery of each man works; how he thinks, how he loves, how he goes from reason to passion and folly; but these phenomena, resulting as they do from the mechanism of the organs, acting under the influence of an interior condition, are not produced in isolation or in the bare void. Man is not alone; he lives in society, in a social condition; and consequently, for us novelists, this social con-
dition unceasingly modifies the phenomena. Indeed our great study is just there, in the reciprocal effect of society on the individual and the individual on society. For the physiologist, the exterior and interior conditions are purely chemical and physical, and this aids him in finding the laws which govern them easily. We are not yet able to prove that the social condition is also physical and chemical. It is that certainly, or rather it is the variable product of a group of living beings, who themselves are absolutely submissive to the physical and chemical laws which govern alike living beings and inanimate. From this we shall see that we can act upon the social conditions, in acting upon the phenomena of which we have made ourselves master in man. And this is what constitutes the experimental novel: to possess a knowledge of the mechanism of the phenomena inherent in man, to show the machinery of his intellectual and sensory manifestations, under the influences of heredity and environment, such as physiology shall give them to us, and then finally to exhibit man living in social conditions produced by himself, which he modifies daily, and in the heart of which he himself experiences a continual transformation. Thus, then, we lean on physiology; we take man from the hands of the physiologist solely, in order to continue the solution of the problem, and to solve scientifically the question of how man behave when they are in society.

These general ideas will be sufficient to guide us today. Later on, when science is farther advanced, when the experimental novel has brought forth decisive results, some critic will explain more precisely what I have but indicated today.

I have reached this point: the experimental novel is a consequence of the scientific evolution of the century; it continues and completes physiology, which itself leans for support on chemistry and medicine; it substitutes for the study of the abstract and the metaphysical man the study of the natural man, governed by physical and chemical laws, and modified by the influences of his surroundings; it is in one word the literature of our scientific age, as the classical and Romantic literature corresponded to a scholastic and theological age. Now I will pass to the great question of the application of all this, and of its justification.

III

This, then, is the end, this is the purpose in physiology and in experimental medicine: to make oneself master of life in order to be able to direct it. Let us suppose that science advances and that the conquest of the unknown is finally completed; the scientific age which Claude Bernard saw in his dreams will then be realized. When that time comes the doctor will be the master of maladies; he will cure without fail; his influence upon the human body will conduce to the welfare and strength of the species. We shall enter upon a century in which man, grown more powerful, will make use of nature and will utilize its laws to produce upon the earth the greatest possible amount of justice and freedom. There is no nobler, higher, nor grander end. Here is our role as intelligent beings: to penetrate to the wherefore of things, to become superior to these things, and to reduce them to a condition of subservient machinery.

Well, this dream of the physiologist and the experimental doctor is also that of the novelist, who employs the experimental method in his study of man as a simple individual and as a social animal. Their object is ours; we also desire to master certain phenomena of an intellectual and personal order, to be able to direct them. We are, in a word, experimental moralists, showing by experiment in what way a passion acts in a certain social condition. The day in which we gain control of the mechanism of this passion we can treat it and reduce it, or at least make it as inoffensive as possible. And in this consists the practical utility and high morality of our naturalistic works, which experiment on man, and which dissect piece by piece this human machinery in order to set it going through the influence of the environment. When things have advanced further, when we are in possession of the different laws, it will only be necessary to work upon the individuals and the surroundings if we wish to find the best social condition. In this way we shall construct a practical sociology, and our work will be a help to political and economical sciences. I do not know, I repeat, of a more noble work, nor of a grander application. To be the master of good and evil, to regulate life, to regulate society, to solve in time all the problems of socialism, above all, to give justice a solid foundation by solving through experiment the questions of criminality—is not this being the most useful and the most moral workers in the human workshop?

Let us compare, for one instant, the work of the idealistic novelists to ours; and here this word idealistic refers to writers who cast aside observation and experiment, and base their works on the supernatural and the irrational, who admit, in a word, the power of mysterious forces outside of the determinism of the phenomena. Claude Bernard shall reply to this for me:

What distinguishes experimental reasoning from scholastic is the fecundity of the one and the sterility of the other. It is precisely the scholastic, who believes he has absolute certitude, who attains to no results. This is easily understood, since by his belief in an absolute principle he puts him-
By and by I shall return to this question of the ideal, which is in truth but the question of indeterminism. Claude Bernard says truly: "The intellectual conquest of man consists in diminishing and driving back indeterminism, and so, gradually, by the aid of the experimental method, gaining ground for determinism." We experimental novelists have the same task; our work is to go from the known to the unknown, to make ourselves masters of nature; while the idealistic novelists deliberately remain in the unknown, through all sorts of religious and philosophical prejudices, under the astounding pretense that the unknown is nobler and more beautiful than the known. If our work, often cruel, if our terrible pictures needed justification, I should find, indeed, with Claude Bernard this argument conclusive:

You will never reach really fruitful and luminous generalization on the phenomena of life until you have experimented yourself and stirred up in the hospital, the amphitheater, and the laboratory the fetid or palpitating sources of life. If it were necessary for me to give a comparison which would explain my sentiments on the science of life, I should say that it is a superb salon, flooded with light, which you can only reach by passing through a long and nauseating kitchen.

I insist upon the word which I have employed, that of experimental novelists as applied to naturalistic novelists. One page of L'Introduction struck me as being very forcible, that in which the author speaks of the vital "circulus."

The muscular and nervous organs preserve the activity of the organs which make the blood; but the blood, in its turn, nourishes the organs which produce it. There is in this a social or organic solidarity, which keeps up a perpetual movement, until the derangement or cessation of the action of a necessary and vital element has broken the equilibrium or brought about some trouble or stoppage in the play of the animal machinery. The problem of the experimentalist doctor consists in finding the cause of any organic disarrangement, that is to say, in seizing the initial phenomenon. We shall see how a dislocation of the organism, or a disarrangement the most complex in appearance, can be traced to a simple initial cause, which calls forth immediately the most complex effects.

All that is necessary here is to change the words experimental doctor to experimental novelist, and this passage is exactly applicable to our naturalistic literature. The social circle is identical with the vital circle; in society, as in human beings, a solidarity exists which unites the different members and the different organisms in such a way that if one organ becomes rotten many others are tainted and a very complicated disease results. Hence, in our novels, when we experiment on a dangerous wound which poisons society, we proceed in the same way as the experimentalist doctor; we try to find the simple initial cause in order to reach the complex causes of which the action is the result. Go back once more to the example of Baron Hulot in Cousine Bette. See the final result, the dénouement of the novel: an entire family is destroyed, all sorts of secondary dramas are produced, under the action of Hulot's amorous temperament. It is there, in this temperament, that the initial cause is found. One member, Hulot, becomes rotten, and immediately all around him are tainted, the social circle is interrupted, the health of that society is compromised. What emphasis Balzac lays on the character of Baron Hulot; with what scrupulous care he analyzes him! The experiment deals with him chiefly, because its object is to master the symptoms of this passion in order to govern it. Suppose that Hulot is cured, or at least restrained and rendered inoffensive, immediately the drama ceases to have any longer any raison d'être; the equilibrium, or more truly the health, of the social body is again established. Thus the naturalistic novelists are really experimental moralists.

And I reach thus the great reproach with which they think to crush the naturalistic novelists, by treating them as fatalists. How many times have they wished to prove to us that as soon as we did not accept free will, that as soon as man was no more to us than a living machine, acting under the influence of heredity and surroundings, we should fall into gross fatalism, we should degrade humanity to the rank of a troop marching under the baton of destiny. It is necessary to define our terms: we are not fatalists, we are determinists, which is not at all the same thing. Claude Bernard explains the two terms very plainly:

We have given the name of determinism to the nearest or determining cause of phenomena. We never act upon the essence of phenomena in nature, but only on their determinism, and by this very fact, that we act upon it, determinism differs from fatalism, upon which we could not act at all,
Fatalism assumes that the appearance of any phenomenon is necessary apart from its conditions, while determinism is just the conditions, essential for the appearance of any phenomenon, and such appearance is never forced. Once the search for the determinism of phenomena is placed as a fundamental principle of the experimental method, there is no longer either materialism, or spiritualism, or inanimate matter, or living matter; there remain but phenomena of which it is necessary to determine the conditions, that is to say, the circumstances which play, by their proximity to these phenomena, the role of nearest cause.

This is decisive. All we do is to apply this method in our novels, and we are the determinists who experimentally try to determine the condition of the phenomena, without departing in our investigations from the laws of nature. As Claude Bernard very truly says, the moment that we can act, and that we do act, on the determining cause of phenomena—by modifying their surroundings, for example—we cease to be fatalists.

Here you have, then, the moral purpose of the experimental novelist clearly defined. I have often said that we do not have to draw a conclusion from our works; and this means that our works carry their conclusion with them. An experimentalist has no need to conclude, because, in truth, experiment concludes for him. A hundred times, if necessary, he will repeat the experiment before the public; he will explain it; but he need neither become indignant nor approve of it personally; such is the truth, such is the way phenomena work; it is for society to produce or not to produce these phenomena, according as the result is useful or dangerous. You cannot imagine, as I have said elsewhere, a savant being provoked with azote because azote is dangerous to life; he suppresses azote when it is harmful, and not otherwise. As our power is not the same as that of a savant, as we are experimentalists without being practitioners, we ought to content ourselves with searching out the determinism of social phenomena, and leaving to legislators and to men of affairs the care of controlling sooner or later these phenomena in such a way as to develop the good and reject the bad, from the point of view of their utility to man.

In our role as experimental moralists we show the mechanism of the useful and the useless, we disengage the determinism of the human and social phenomena so that, in their turn, the legislators can one day dominate and control these phenomena. In a word, we are working with the whole country toward that great object, the conquest of nature and the increase of man’s power a hundredfold. Compare with ours the work of the idealistic writers, who rely upon the irrational and the supernatural, and whose every flight upward is followed by a deeper fall into metaphysical chaos. We are the ones who possess strength and morality.

IV

... If Claude Bernard confesses that the complexity of its phenomena will prevent medicine, for a long time yet, from arriving at a scientific state, what shall we say of the experimental novel, in which the phenomena are much more complicated still? But this does not prevent the novel from entering upon the scientific pathway, obedient to the general evolution of the century.

Moreover, Claude Bernard himself has indicated the evolutions of the human mind. “The human mind,” he says, at various periods of its progress has passed successively through feeling, reason, and experiment. First, feeling alone, dominating reason, created the truths of faith, that is to say, theology. Reason, or philosophy, becoming afterward the mistress, brought forth scholasticism. Finally, experiment, that is to say, the study of natural phenomena, taught man that the truths of the exterior world were to be found formulated, in the first place, neither in reason nor in feeling. These last are, indeed, our indispensable guides, but to obtain the truth it is necessary to descend into the objective reality of things, where they lie concealed under their phenomenal form. Thus it is that in the natural progress of things the experimental method appears, which sums up the whole, and which supports itself successfully on the three branches of this immovable tripod: feeling, reason, and experiment.

In the search after truth by means of this method, feeling has always the initiative; it engenders the idea a priori or intuition; reason, or the reasoning power, immediately develops the idea and deduces its logical consequences. But if feeling must be guided by the light of reason, reason in its turn must be guided by experiment.

I have given this passage entire, as it is of the greatest importance. It shows clearly the role that the personality of the novelist should play, apart from the style. Since feeling is the starting point of the experimental method, since reason subsequently intervenes to end in experiment, and to be controlled by it, the genius of the experimentalist dominates everything, and this is what has made the experimental method, so inert in other hands, such a powerful tool in the hands of
Claude Bernard. I have said the word: method is but the tool; it is the workman, it is the idea, which he brings, which makes the chef-d'oeuvre. I have already quoted these lines: "It is a particular feeling, a quid proprium, which constitutes the originality, the invention, or the genius of each one." This, then, is the part taken by genius in the experimental novel. As Claude Bernard says again: "The idea is the seed; the method is the soil which furnishes the conditions for developing and prospering it, and bringing forth its best fruits, according to nature." Thus everything is reduced to a question of method. If you are content to remain in the a priori idea, and enjoy your own feelings without finding any basis for it in reason or any verification in experiment, you are a poet; you venture upon hypotheses which you cannot prove; you are struggling vainly in a painful indeterminism, and in a way that is often injurious. Listen to these lines of L'Introduction:

Man is naturally a metaphysician and proud; he believes that the idealistic creations of his brain, which coincide with his feelings, represent the reality. Thus it follows that the experimental method is not innate and natural to man, for it is only after having wandered for a long time among theological and scholastical discussions that he ends by recognizing the sterility of his efforts in this path. Man then perceives that he cannot dictate laws to nature, because he does not possess in himself the knowledge and the criterion of exterior things; he realizes that in order to arrive at the truth he must, on the contrary, study the natural laws and submit his ideas, if not his reason, to experiment, that is to say, to the criterion of facts.

What becomes of the genius of the experimental novelist? The genius, the idea a priori, remains, only it is controlled by experiment. The experiment naturally cannot destroy his genius; on the contrary, it confirms it. To take the case of a poet, for example: To show he has genius is it necessary that his feeling, his idea, a priori, should be false? Evidently not, for the genius of a man will be so much the greater when experiment has proved the truth of his personal idea. Our age of lyricism, our Romantic disease, was alone capable of measuring a man's genius by the quantity of nonsense and folly which he put in circulation. I conclude by saying that in our scientific century experiment must prove genius.

This is the drift of our quarrel with the idealistic writers. They always start out from an irrational source of some kind, such as a revelation, a tradition, or conventional authority. As Claude Bernard declares: "We must admit nothing occult; there are but phenomena and the conditions of phenomena." We naturalistic novelists submit each fact to the test of observation and experiment, while the idealistic writers admit mysterious elements which escape analysis, and therefore remain in the unknown, outside of the influence of the laws governing nature. This question of the ideal, from the scientific point of view, reduces itself to a question of indeterminacy or determinate. All that we do not know, all that escapes us still, is truly the ideal, and the aim of our human efforts is each day to reduce the ideal, to conquer truth from the unknown. We are all idealists, if we mean by this that we busy ourselves with the ideal. But I dub those idealists who take refuge in the unknown for the pleasure of being there, who have a taste but for the most risky hypotheses, who disdain to submit them to the test of experiment under the pretext that the truth is in themselves and not in the things. These writers, I repeat, accomplish a vain and harmful task, while the observer and the experimentalist are the only ones who work for the strength and happiness of man, making him more and more the master of nature. There is neither nobility, nor dignity, nor beauty, nor morality in not knowing, in lying, in pretending that you are greater according as you advance in error and confusion. The only great and moral works are those of truth.

What we alone must accept is what I will call the stimulus of the ideal. Certainly our science is very limited as yet, beside the enormous mass of things of which we are ignorant. This great unknown which surrounds us ought to inspire us with the desire to pierce it, to explain it by means of scientific methods. And this does not refer only to scientific men; all the manifestations of human intelligence are connected together, all our efforts have their birth in the need we feel of making ourselves masters of the truth.

V

... I have already repeated twenty times that naturalism is not a personal fantasy, but that it is the intellectual movement of the century. Perhaps they will believe Claude Bernard, who speaks with greater authority on this subject than I can lay claim to; he declares that:

The revolution which the experimental method has caused in science consists mainly in the substitution of a scientific criterion for a personal authority. It is the characteristic of the experimental method to depend only on itself, as it carries
within itself its criterion, which is experiment. It recognizes no authority but that of facts; and it frees itself from personal authority.

Consequently, it no longer admits the authority of any theory either.

The idea should always remain independent; it must be enchained neither by scientific, nor philosophical, nor religious beliefs. Man must be strong and free in the manifestation of his ideas, must follow his instinct, and not dwell upon the puerile fears of the contradiction of any theories. He must modify theory by adapting it to nature, and not nature by adapting it to theory.

From this there results an incomparable breadth.

The experimental method is the scientific method which proclaims the liberty of thought. It not only throws off the philosophical and theological yoke, but it no longer admits scientific personal authority. This is not said from pride or boastfulness. The experimentalist, on the contrary, shows his humility in denying personal authority, for he doubts his own knowledge, and he submits the authority of men to that of experiment and the laws which govern nature.

This is why I have said so many times that naturalism is not a school, as it is not embodied in the genius of one man, nor in the ravings of a group of men, as was Romanticism; that it consists simply in the application of the experimental method to the study of nature and of man. Hence it is nothing but a vast movement, a march forward in which everyone is a workman, according to his genius. All theories are admitted, and the theory which carries the most weight is the one which explains the most. There does not appear to me to be a literary or scientific path larger or more direct. Everyone, the great and the small, moves freely, working and investigating together, each one in his own specialty, and recognizing no other authority than that of facts proved by experiment. Therefore in naturalism there could be neither innovators nor leaders; there are simply workmen, some more skillful than others.

I have said that in the experimental novel it is best for us to hold to the strictly scientific point of view if we wish to base our studies on solid ground; not to go out from the "how," not to attach ourselves to the "why." However, it is very certain that we cannot always escape this need of our intelligence, this restless curiosity which makes us desire to know the essence of things. I think that it is best for us to accept the philosophical system, which adapts itself the best to the actual condition of the sciences, but simply from a speculative point of view. For example, transformism is actually the most rational system, and is the one which is based most directly upon our knowledge of nature. Behind a science, behind a manifestation of any kind of the human intelligence, there always lies more or less clearly what Claude Bernard calls a philosophical system. To this system it is not well to attach oneself devotedly, but to hold tenaciously to the facts, free to modify the system if the facts call for it. But the system exists nonetheless, and it exists so much the more as science is less advanced and less firm. For us naturalistic novelists, who are still in the lisping stage, hypothesis is fatal. By and by I will take up the role of hypothesis in literature.

Nevertheless, if in practice Claude Bernard thrusts aside philosophical system, he recognizes the necessity of philosophy.

From a scientific point of view, philosophy represents the eternal desire of the human reason after knowledge of the unknown. Hence philosophers always confine themselves to questions that are in dispute, and to those lofty regions that lie beyond the boundaries of science. In this way they communicate to science a certain inspiration which animates and ennobles it. They strengthen the mind—developing it by an intellectual gymnastics—at the same time that they ever carry it toward the never-completed solution of great problems. Thus they keep up a cult of the unknown, and quicken the sacred fire of investigation, which ought never to be extinguished in the heart of a savant.

This passage is very fine, but the philosophers have never been told in better terms that their hypotheses are pure poetry. Claude Bernard evidently looks upon the philosophers, among whom he believes he has a great many friends, as musicians often gifted with genius, whose music encourages the savants while they work and inspires the sacred fire of their great discoveries. But the philosophers, left to themselves, will sing forever and never discover a single truth.

I have neglected until now the question of form in the naturalistic novel, because it is precisely there that individuality shows in literature. Not only is a writer's genius to be found in the feeling and in the idea a priori but also in the form and style. But the question of method and the question of rhetoric are distinct from each other. And by naturalism, I say again, is meant the experimental method, the introduc-
tion of observation and experiment into literature. Rhetoric, for the moment, has no place here. Let us first fix upon the method, on which there should be agreement, and after that accept all the different styles in letters which may be produced, looking upon them as the expressions of the literary temperament of the writers.

If you wish my true opinion upon this subject, it is this: that today an exaggerated importance is given to form. I have a great deal to say on this subject, but it would carry me beyond the limits of this essay. In reality, I think that the form of expression depends upon the method: that language is only one kind of logic, and its construction natural and scientific. He who writes the best will not be the one who gallops madly among hypotheses, but the one who walks straight ahead in the midst of truths. We are actually rotten with lyricism; we are very much mistaken when we think that the characteristic of a good style is a sublime confusion with just a dash of madness added; in reality, the excellence of a style depends upon its logic and clearness.

Claude Bernard considers that philosophers are really musicians who play a sort of Marseillaise made up of hypotheses, and swell the hearts of the savants as they rush to attack the unknown; and he has much the same idea of artists and writers. I have remarked that a great many of the most intelligent savants, jealous of the scientific certainty which they enjoy, would very willingly confine literature to the ideal. They themselves seem to feel the need of taking little recreations in the world of lies after the fatigue of their exact labors, and they are fond of amusing themselves with the most daring hypotheses, and with fictions which they know perfectly well to be false and ridiculous. Claude Bernard was right when he said: "Literary and artistic productions will never grow old in the sense that they are the expressions of sentiments as unchangeable as human nature." In fact, form is sufficient to immortalize a work; the spectacle of a powerful individuality reproducing nature in superb language will interest all ages; only the works of a savant, from this same point of view, will be read always, for the reason that the thought of a great savant who knows how to write is much more interesting than that of a poet. However far astray the savant may be in his hypothesis, he still remains the equal of the poet, who is certain to have been equally mistaken. The point to be emphasized is this, that our domain is not limited to the expression of sentiments as unchangeable as human nature because it is essential also to exhibit the working of these sentiments.

We have not exhausted our matter when we have depicted anger, avarice, and love; all nature and all of man belong to us, not only in their phenomena, but in the causes of these phenomena. I well know that this is an immense field,
objection, besides, to its showing in the hypothesis, but it is necessary to clearly understand what you mean by these words.

It has often been said that writers ought to open the way for savants. This is true, for we have seen in L'Introduction that hypothesis and empiricism precede and prepare for the scientific state which is established finally by the experimental method. Man commenced by venturing certain explanations of phenomena, the poets gave expression to their emotions, and the savants ended by mastering hypotheses and fixing the truth. Claude Bernard always assigns the role of pioneers to the philosophers. It is a very noble role, and today it is the writers who should assume it and who should endeavor to fill it worthily. Only let it be well understood that each time that a truth is established by the savants the writers should immediately abandon their hypothesis to adopt this truth; otherwise they will remain deliberately in error without benefiting anyone. It is thus that science, as it advances, furnishes to us writers a solid ground upon which we should lean for support, to better enable us to shoot into new hypotheses. In a word, every phenomenon, once clearly determined, destroys the hypothesis which it replaces, and it is then necessary to transport your hypothesis one step farther into the new unknown which arises. I will take a very simple example in order to make myself better understood: it has been proved that the earth revolves around the sun; what would you think of a poet who should adopt the old belief that the sun revolves around the earth? Evidently the poet, if he wishes to risk a personal explanation of any fact, should choose a fact whose cause is not already known. This, then, illustrates the position hypothesis should occupy for experimental novelists; we must accept determined facts, and not attempt to risk about them our personal sentiments, which would be ridiculous, building throughout on the territory that science has conquered; then before the unknown, but only then, exercising our intuition and suggesting the way to science, free to make mistakes, happy if we produce any data toward the solution of the problem. Here I stand at Claude Bernard's practical program, who is forced to accept empiricism as a necessary forerunner. In our experimental novel we can easily risk a few hypotheses on the question of heredity and surroundings, after having respected all that science knows today about the matter. We can prepare the ways, we can furnish the results of observation, human data which may prove very useful. A great lyrical poet has written lately that our century is a century of prophets. Yes, if you wish it; only let it be well understood that these prophets rely neither upon the irrational nor the supernatural. If the prophets thought best to bring up again the most elementary notions, to serve up nature with a strange religious and philo-

3Reference to themes of the Odyssey and the Aeneid respectively.