ideal, and find nothing in pantaloons or petticoats great enough to command their reverence and love, are curiously in unison with the narrowest and pettiest. For example, I have often heard Mr. Gedge, the landlord of the Royal Oak, who used to turn a bloodshot eye on his neighbours in the village of Shepperton, sum up his opinion of the people in his own parish—and they were all the people he knew—in these emphatic words: "Ay, sir, I've said it often, and I'll say it again, they're a poor lot i' this parish—a poor lot, sir, big and little." I think he had a dim idea that if he could migrate to a distant parish, he might find neighbours worthy of him; and indeed he did subsequently transfer himself to the Saracen's Head, which was doing a thriving business in the back street of a neighbouring market-town. But, oddly enough, he has found the people up that back street of precisely the same stamp as the inhabitants of Shepperton—"a poor lot, sir, big and little, and them as comes for a go o' gin are no better than them as comes for a pint o' two-penny—a poor lot."

Émile Zola
(1840–1902)

from *THE EXPERIMENTAL NOVEL*[1]

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 manifestations 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

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:

[1]Translated by Belle M. Sherman. Émile Zola was both the chief theoretician and principal practitioner of Naturalism in France. In his Rougon-Macquart cycle of twenty novels, he traced the influence of heredity and environment on two branches of a family through several generations. These novels include *L'Assommoir* (1877), *Nana* (1880), and *Germinal* (1885). *The Experimental Novel*, Zola's rationale for his work, was published in 1880.

"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.

I cannot follow him in his discussion of the different definitions given up to the present time. As I have said before, he finishes by coming to the conclusion that experiment is but provoked observation. I repeat his words: "In the experimental method the search after facts, that is to say, investigation, is always accompanied by a reason, so that ordinarily the experimentalist makes an experiment to confirm and verify the value of an experimental idea. In this case you can say that experiment is an observation instigated for the purpose of verification."

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 *mélange*, 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 facts 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 did 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 to-day, is a real experiment that a novelist makes on many 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 to-day. 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.

The writer's office, far from being lessened, grows singularly from this point of view. An experiment, even the most simple, is always based on an idea, itself born of an observation. As Claude Bernard says: "The experimental idea is not arbitrary, nor purely imaginary; it ought always to have a support in some observed reality, that is to say, in nature." It is on the idea and on doubt that he bases all the method. "The appearance of the experimental idea," he says further on, "is entirely spontaneous and its nature absolutely individual, depending upon the mind in which it originates; it is a particular sentiment, a *quid proprium*, which constitutes the originality, the invention, and the genius of each one." Further, he makes doubt the great scientific lever. "The doubter is the true savant; he doubts only himself and his interpretations; he believes in science; he even admits in the experimental sciences a criterion or a positive principle, the determinism of phenomena, which is absolute in living beings as in inanimate bodies." Thus, instead of confining the novelist within narrow bounds, the experimental method gives full sway to his intelligence as a thinker, and to his genius as a creator. He must see, understand, and invent. Some observed fact makes the idea start up of trying an experiment, of writing a novel, in order to attain to a complete knowledge of the truth. Then when, after careful consideration, he has decided upon the plan of his experiment, he will judge the results at each step with the freedom of mind of a man who accepts only facts conformable to the determinism of phenomena. He set out from doubt to reach positive knowledge; and he will not cease to doubt until the mechanism of the passion, taken to pieces and set up again by him, acts according to the fixed laws of nature. There is no greater, no more magnificent work for the human mind. We shall see, further on, the miseries of the scholastics, of the makers of systems, and those theorizing about the ideal, compared with the triumph of the experimentalists.

I sum up this part by repeating that the naturalistic novelists observe and experiment, and that all their work is the offspring of the doubt which seizes 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

. . . 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. . . . 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 applies 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 inter-organic 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. Some day 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 condition 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 men behave when they are in society.

These general ideas will be sufficient to guide us to-day. 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 to-day.

Elsewhere Claude Bernard confesses how difficult it is to apply the experimental method to living things. "The living body," he says, "especially among the higher animals, never falls into chemical or physical indifference with the exterior conditions; it possesses an incessant movement, an organic evolution apparently spontaneous and constant; and notwithstanding the fact that this evolution has need of exterior circumstances to manifest itself, it is, however, independent in its course and movement." And he concludes as I have: "In short, it is only in the physical and chemical conditions of the interior that we shall find the principle that governs the exterior phenomena of life." But whatever complexities may present themselves, and even when extraordinary phenomena are produced, the application of the experimental method is imperative. If the phenomena of life have a complexity and an apparent difference from those of inanimate bodies, they do not offer this difference, except by reason of determined or determinable conditions which belong to them. Therefore, even should the sciences dealing with life differ from the others in their application and in their special laws, they are not to be distinguished by their scientific method."

I must say one word as to the limits which Claude Bernard assigns to science. According to him we shall always be ignorant of the "why" of things; we can only know the "how." It is this that he expresses in the following terms: "The nature of our minds urges us to seek the essence or the 'why' of things. In this we see further than the goal it has been given us to attain to; for experiment soon teaches us that we must not go beyond the 'how'; that is to say, beyond the nearest cause or the condition of the existence of any phenomenon." Further on he gives this example: "If we can discover 'why' opium and its alkaloids produce sleep, we shall know the mechanism of such slumber, and know 'how' opium or its essence produces sleep; for slumber only takes place because the active substance is about to put itself in contact with certain organic elements which it modifies." The practical conclusion of all this is the following: "Science has precisely the privilege of teaching us what we are ignorant of, through its substitution of reason and experiment for sentiment, and by showing us clearly the limit of our actual knowledge. But, by a marvelous compensation, in proportion as science humbles our pride, it strengthens our power." All these considerations are strictly applicable to the experimental novel. In order not to lose itself in philosophical speculations, in order to replace idealistic hypothesis by a slow conquest of the unknown, it must continue the search after the "how" of things. This is its exact rôle, and it is from this that it must draw, as we are going to see, its reasons for being and its moral.

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

The object of the experimental method in physiology and in medicine is to study phenomena in order to become their master. Claude Bernard in each page of "L'Introduction" comes back to this idea. He declares: "All natural philosophy is summed up in this: To know the laws which govern phenomena. The experimental problem reduces itself to this: To foresee and direct phenomena." . . .

This, then, is the end, this is the purpose in physiology and in experimental medicine: to make one's self 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 rôle 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 himself outside of nature, in which everything is relative. It is, on the contrary, the experimenter, who is always in doubt, who does not think he possesses absolute certainty about anything, who succeeds in mastering the phenomena which surround him, and in increasing his power over nature." 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 generalizations 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." . . .

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 circulus 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 debase 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 for 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 assures that the appearance of any phenomenon is necessary apart from its conditions, while determinism is just the condition 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 rôle 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 rôle 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.

Anton Chekhov
(1860–1904)

from *LETTERS*[1]

To Madame M. V. Kiselyov
Moscow,
January 14, 1887.

. . . Even your praise of "On the Road" has not softened my anger as an author, and I hasten to avenge myself for "Mire." Be on your guard, and catch hold of the back of a chair that you may not faint. Well, I begin.

One meets every critical article with a silent bow even if it is abusive and unjust—such is the literary etiquette. It is not the thing to answer, and all who do answer are justly blamed for excessive vanity. But since your criticism has the nature of "an evening conversation on the steps of the Babkino lodge" . . . and as, without touching on the literary aspects of the story, it raises general questions of principle, I shall not be sinning against the etiquette if I allow myself to continue our conversation.

In the first place, I, like you, do not like literature of the kind we are discussing. As a reader and "a private resident" I am glad to avoid it, but if you ask my honest and sincere opinion about it, I shall say that it is still an open question whether it has a right to exist, and no one has yet settled it. . . . Neither you nor I, nor all the critics in the world, have any trustworthy data that would give them the right to reject such literature. I do not know which are right: Homer, Shakespeare, Lopes da Vega, and, speaking generally, the ancients who were not afraid to rummage in the "muck heap," but were morally far more stable than we are, or the modern writers, priggish on paper but coldly cynical in their souls and in life. I do not know which have bad taste—the Greeks who were not ashamed to describe love as it really is in beautiful nature, or the readers of Gaboriau, Marlitz, Pierre Bobo. Like the problems of non-resistance to evil, of free will, etc., this question can only be settled in the future. We can only refer to it, but are not competent to decide it. Reference to Turgenev and Tolstoy—who avoided the "muck heap"—does not throw light on the question. Their fastidiousness does not prove anything; why, before them there was a generation of writers who regarded as dirty not only accounts of

[1]Translated by Constance Garnett. For Chekhov's life and works, see the introduction to *The Cherry Orchard*.

[2]The Kiselyovs were neighbors of Chekhov when he lived in Voskresensk, a small town where his brother Ivan was the teacher at the village school. Madame Kiselyov, the daughter of the director of the Moscow Imperial Theatre, was a writer herself, and she and Chekhov read one another's work. This letter was written in response to one from Madame Kiselyov in which she criticized Chekhov's story "Mire" for its unpleasant subject matter.