

## THE HUMAN STRIVING AND THE CATEGORIES OF SCIENCE<sup>1</sup>

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A CERTAIN school of philosophers have tried to persuade us that the human striving, or the moral consciousness, and the principles of scientific reason have no relationship in common. It is but necessary to cast a glance at the history of pragmatism to appreciate the inadequacy of such an assertion. In the original article of C. S. Peirce on "How to Make Our Ideas Clear,"<sup>2</sup> the argument concerned the principles of scientific method. After reviewing the notions of Bacon and Descartes, as well as the attempts of lesser philosophers to legislate for science, the American mathematician came to the conclusion that it was necessary to bring reason into the laboratory—much as Kepler had done when he painstakingly plotted every possible curve that could explain the movement of Mars. From a discussion of the logic of science, pragmatism was transformed into a philosophy of voluntaristic fideism. And even if Mr. Dewey has attempted to swing the movement away from some of the temperamental excesses of James, the fact remains that in the pragmatic philosophy logic and moral striving are still very closely united.

To be sure, the realistic critics have used pragmatism as the horrible example of what happens when reasons of the heart are allowed to interfere with reasons of the intellect. And it certainly is true that pragmatism in many instances has weakened the authority of the intellect, and has opened the door to all manner of affective vagaries. The same charge is applicable to the Bergsonian philosophy of the intuition, which beginning as a critique of scientific orthodoxy has ended up as an apology for modernistic Catholicism. Granted that these movements have been to a large extent intel-

<sup>1</sup>A critical discussion based on *L'Expérience Humaine et la Causalité Physique*, by Léon Brunschvicg. Paris, Alcan, 1922, pp. 625, xvi.

luctually destructive, the very fact that the moral consciousness can play such tricks is in itself highly significant. We must deal with the reasons of the heart if only for their power to make trouble. We cannot follow out the suggestion that Mr. Russell offers in "The Freeman's Worship," and let our heart cherish lofty thoughts with no other specific content than their mere loftiness. The heart refuses to be fooled that way.

If the moral striving cannot be permanently separated from our intellectual activity, and if the method of pragmatism and the method of the Bergsonian intuition lead only to the breakdown of intellectual authority, there is yet the method of Spinoza—the union of love and knowledge in the *amor dei intellectualis*. It is also the method of Plato and the method of Kant. All three of these philosophers educated their sensibility by a devotion to science, instead of undermining their reason by giving free rein to their sensibility. All three meditated the experience of mathematics. ". . . Truth," wrote Spinoza, "might have lain hidden from the human race through all eternity, had not Mathematics, which deals not in final causes but in the essences and properties of things, offered to men another [and veritable] norm of truth."<sup>3</sup>

What clearer illustration can be given of the gulf separating the Spinozistic norm of truth from the norm of pragmatism than to cite in this connection the lines written in 1893 by William James to his friend Flournoy?

"Pourquoi suis-je depourvu du sens mathématique. Toutes les propositions mathématiques me semblent non seulement inintelligibles, mais fausses. Renouvier m'a toujours contenté par son exposition; et voilà qu'il va falloir que je me remette à l'école."<sup>4</sup>

While these lines are not meant to be taken too seriously, they do give an *aperçu* of the motivation of the Jamesian temperament, and M. Brunschvicg is right in observing that "the *Varieties of Religious Experience* would bear quite a different interpretation the moment one understood that there exists *Varieties of Mathematical Experience*, no less fascinating and no less suggestive."<sup>5</sup>

For the task of interpreting the human striving in its multiple philosophic aspects, no writer could be better fitted than M. Brunschvicg. Historian of Spinoza, commentator of Pascal, equipped with the solid weapon of mathematical training as displayed in his

<sup>2</sup>"Popular Science Monthly," Dec., 1877.

<sup>3</sup>Ethics, Part I, app. Cf. Van Vloten and Land, vol. 1, p. 71.

<sup>4</sup>*La Vie et l'Œuvre de Théodore Flournoy*, Archives de Psychologie, 1921, p. 95.

<sup>5</sup>*L'Expér. Hum.*, p. xi.

*Etapas de la Philosophie Mathématique*, and nurtured in an intellectual atmosphere where science and philosophy have been brought more and more together—our author has used all these advantages to perform a difficult piece of work well. He has employed a method which might be characterized as historical impressionism. Certainly no method is more open to abuse than that of arriving at a point of view by reading and commenting upon history. The danger of reading into history one's own preconceptions is assuredly very great, but its magnitude is in inverse proportion to the erudition of the historian. In the case of M. Brunschvicg, while his present work, *L'Expérience Humaine et la Causalité Physique*, is not to be ranked, and is not meant to be ranked as a history, it would seem that he has lived up, as well as any man can, to the ambitious formula he himself has set for all his writing:

"Philosophy will know what men have believed, and why they have believed in it; it will say why there are certain propositions which it is absurd to maintain in this day, others which it would be no less absurd not to maintain. Philosophy will sum up the experience of thinking humanity, and this experience must be made complete by a test of truth, which will bring about discrimination between values, which will eliminate diversity and contradictions, allowing to remain only the unique truth."<sup>6</sup>

M. Brunschvicg's subject is at the heart of the modern philosophic problem—one might say the philosophic problem of all time. It is not merely a cold intellectual antinomy—the logical absurdity of the causal relation—that concerns us. It is the validity of science, the efficacy of human effort which are at stake. The crucial issues upon which turned the warfare between religion and science in the seventeenth century and between science and moral philosophy in the nineteenth and twentieth centuries embrace this central paradox of causality. It is easy enough to take one side or another in the battle—to be a dogmatic scientific determinist and forget the troubles of the moral life, or to believe in faith and deny the necessity of science. But even when human experience is thus artificially divided into water-tight compartments, new difficulties rise up in each section. The orthodox principles of science lead to logical contradictions at every step. And as for faith, it cannot get along by itself; it demands a concrete intellectual creed, and even apologetics must obey the rules of logical consistency.

For the solution of these multiple contradictions, there is no genuine method other than the method of science and philosophy. This

<sup>6</sup>*Nature et Liberté*, Paris, Flammarion, 1921, p. x.

lesson M. Brunschvicg has learned by a confrontation of the intellectual careers of Pascal and Spinoza, and it was at the conclusion of his studies on these philosophers, published in 1906, that he thus summed up the relation of reason to faith:

"Reason is not an element of a synthesis which is to be established by a compromise between reason and faith; it is the positive function of the synthesis, while the role of faith is to occupy the place of anticipation which reason is to reach, to provoke the effort which will make this reason equal to its own task."<sup>7</sup>

M. Brunschvicg's motive in writing his comprehensive treatise on causality is obvious to the reader who cares to look between the lines. It is to banish the ghost of scientific materialism which haunts our modern civilization. But the knowledge of this motive does not in any way diminish the philosophic value of the work—no more than a knowledge of Spinoza's psychology destroys the logical consistency of the *Ethics*.

Nearly a hundred pages are devoted to a consideration of the doctrines of pure empiricism. These theories, bobbing up now and then in the course of history, have pretended to explain the organization of experience automatically without any intellectual effort or contribution on the part of the human mind. Perhaps the most blatant exposition of empiricism is that of John Stuart Mill, who tried to derive the principles of induction by induction itself. The ancient empiricists were never so ambitious. Thus Sextus Empiricus writes in the *Adversus Mathematicos* (V, 104): "If in medicine we know that a lesion of the heart brings on death, it is not through a single observation, but because after having observed the death of Dion, we see the death of Theon, Socrates, and many others."<sup>8</sup> In other words, empiricism was merely an upper limit to scepticism.

The case was different with Hume. Here we have a philosopher who oscillated between extreme scepticism and extreme credulity. After having challenged the efficacy of natural causality to such a point as to destroy all unity in experience, he good-naturedly re-established a happy ending in his philosophy by bringing in the *deus ex machina* of universal attraction or association—an extension by analogy of Newtonian gravitation. In his historical judgment on Hume, M. Brunschvicg follows the idealistic tradition according to which the Scotch philosopher is important not for himself as for his relation to Kant.

Turning to the intellectual or rationalistic organization of experiences, M. Brunschvicg discusses the various successive phases in

<sup>7</sup>Revue de Métaphysique et de Morale, XIV, 1906, p. 731.

<sup>8</sup>Cited by Brunschvicg, p. 5.

the development of the doctrine of causality. One section deals with the notions of causality among primitive peoples, and the author takes the occasion to demolish the positivistic interpretation of M. Lévy-Bruhl that the savage mentality is pre-logical. Relying upon the same documentation as the sociological school, M. Brunshvicg is able to show that what the savage mind lacks, just as what the mediaeval mind lacked when it asserted that nature abhors a vacuum, is the mathematical tool by which modern physics and the chemistry of Lavoisier have built up fixed equations to support the observations of the senses. The savage mind is then pre-scientific but not necessarily pre-logical.

It is in dealing with ancient philosophy that M. Brunshvicg's historical interpretation is put to a severe test. The responsibility for the Aristotelian finalism, which dominated the Western world for twenty centuries, is traced to the failure of Plato's mathematical philosophy. The issue of mechanism vs. finalism was already there when Aristotle came on the scene. The naturalists had developed mechanism, but this philosophy proved fruitless for the reason that the ancients lacked the instrument of calculation which alone has made modern science successful. Finalism had grown out of the practical moral philosophy. Plato saw the weakness of both alternatives, and tried to find a way out by the path that Pythagoras had traced, but, finding himself unable to render account of change and becoming by the eternal essences of either numbers or ideas, he introduces the notion of the demi-urge as the ordinator of the universe. There was nothing left for Aristotle to do, but to register the defeat of Plato, and to conciliate in eclectic fashion both finalism and mechanism.

The Cartesian revolution is hailed by the author as a triumph of mathematics over scholasticism. Its great virtue is that it geometrised physics at the same time that it reduced geometry to algebra. The essence of Cartesian rationalism is that it abandoned the search for the real causes of mechanical action but set itself the task of observing relations. This philosophic gain was compromised by the subsequent development of Newtonian physics with its action at a distance.

"The hope which after Descartes the seventeenth century had been able to form, that of finding in the mechanistic conception of the universe a definitive solution of the problem of causality, was not realized. Not only do we observe, with Leibnitz and with Newton, the return of that notion of force which seemed to have been chased out of philosophy by the discredit of the scholastic tradition,



but this revival comes about through two different ways, which lead to two nations of force, incompatible each with the other. The Leibnitzian notion of active force is regarded as imaginary by the Newtonians, because it proceeds from a metaphysical speculation, the truth of which has not been submitted to a test of facts; the Newtonian or post-Newtonian notion of force is regarded as imaginary by the Leibnitzians because it does not satisfy the conditions of spatial contact required by scientific comprehension. A double conflict has to be resolved by the eighteenth century: inside of rational mechanics, the conflict of mechanism and dynamism between Cartesians and Leibnitzians; and on the other hand inside of dynamism, the conflict of metaphysical mathematicism and experimental mathematicism."<sup>9</sup>

Part of this conflict was, as we know, removed by Kant, and the doctrine of the a-priori. Without renouncing in any way the Cartesian principle that for the speculative knowledge of the universe there exists but one type of truth, that of mathematics, the Kantian criticism bridged the gap between mathematics and physics by means of the forms of the intuition. On the experimental side the problems set by the Newtonian cosmology were not really solved until the development of Einsteinian relativity. From his point of view as a critical idealist, M. Brunschvicg takes no pains to conceal the joy with which he greets the new physics. The concept of energy has long since been regarded as nothing more than a mathematical integral, and now we are able at last to reduce gravity—to this occult force acting at a distance—to geometry and differential equations.

To be sure there still remain obstacles in the way of mathematical idealism as a philosophy of science. There is the obstreperous quantum theory, which challenges the hypothesis of mathematical continuity. And there is the atomic hypothesis, which after its various vicissitudes, has now gained new strength through the work of M. Jean Perrin. But even though the atom has been counted and measured, we have not yet reached the cosmological ultimate of Democritus.

"The atoms," writes M. Perrin, "are not these eternal and indivisible elements whose irreducible simplicity would set a limit to the possible, and, in their unimaginable smallness, we commence to anticipate a prodigious swarming of new worlds. Thus the astronomer, with his head growing dizzy at the sight, discovers beyond the familiar skies, beyond the abysses of shadow that light takes milleniums to traverse, pale flakes lost in space, milky ways, immeasurably distant, whose feeble glimmer yet reveals to us the palpitation

<sup>9</sup>*Ibid.*, p. 251.

of millions of giant stars. Nature employs the same limitless splendor both in the Atom and in the Nebulus, and every new instrument of knowledge shows her to be more vast and variegated, more fecund, more unexpected, more beautiful, more rich in its fathomless immensity."<sup>10</sup>

It is against the background of modern mathematical physics that M. Brunschvicg paints his personal philosophy. Shunning metaphysics, he is content with a philosophy of human experience, a philosophy whose sole aim is to reflect upon the progress of thought with a view to dispel prejudices and to face the future with a confidence of an understanding of the past.

"The comprehension of scientific knowledge demands an effort of reflexion upon the perspective according to which the spirit disposes both the notions which will be the instrument of its conquest and the data through which experience answers its questions, upon the manner in which the adaptation of the measure to the thing measured permits of establishing a connection and harmony between the notions of rational order and the facts of the experimental order. And we shall grasp the secret of this perspective only if we know how to plunge ourselves into the remote past of history, if we see how, by the elan of invention and by the unexpected reaction of observation, have been developed, crystalized, and then broken, the notions which serve to put the problem of the universe into equations, how the methods have been remodeled, and refined in order to give the means for perfecting endlessly the approximation of the solutions already attained."<sup>11</sup>

The philosophy of M. Brunschvicg opposes itself with equal rigor both to the conceptualism of classic rationalism and to the modern anti-intellectualism. From Lachelier he has acquired the doctrine that judgment is the ultimate term of human thought, and from Emile Boutroux he has borrowed the idea of contingency in the laws of nature. Out of such elements he has constructed a two-fold philosophy of Socratic humanism in morals and mathematical determinism in the world of science. Both are possible the moment one realizes that determinism does not mean *predeterminism*, that determinism means nothing more than the act of the human mind in organizing objectively and mathematically the external world into a system.

Is this subjectivism of the type of pragmatism?

"This might be true if before perception and before the universe humanity was already something entirely given and entirely developed, in such a way that by starting with this complete notion of man and by defining the structure of his sensibility and intellect, perception and science would be explained, as *subjective synthèses*

<sup>10</sup>*Les Atomes*, Paris, Alcan, 1913, p. 291. Cf. Brunschvicg, p. 392.

<sup>11</sup>*L'Exper. Hum.*, p. 570.

Now . . . if such is indeed the conception which realism forms of idealism in order to bolster up its polemic, it is far from the veritable interpretation of idealism, at least since the advent of modern psychology and critical reflexion. Man is not known before the universe; we do not know ourselves as individuals occupying a portion of space and living in time except after having organized—except through organizing—our visual and tactual impressions in such a manner as to give us a plurality of mobile objects across the succession of decorations which dominate our horizon; and we take cognizance of ourselves as being objects among objects. If we did not succeed in putting a reasonable order in the world surrounding us, we should not become ourselves, for ourselves, reasonable beings. According to the expression of Jules Lachelier: 'Incoherence outside is madness inside.'<sup>12</sup>

Because reason has grown out of experience and has been refined by experience gives no license to the pragmatic fallacy of regarding experience as an absolute. Brute experience is by itself a negation, a point of resistance, which becomes significant only when it is transformed into an intellectual point of departure. So, too, the moral philosophy of action which has been so largely encouraged by pragmatism reveals itself as an inadequate guide precisely because it emphasizes the wrong phase of the human dialectical process.

"The Stoics used to say that just as it often happens that a man who is introduced to another values this new friend more highly than he does the person who gave him the introduction, so in like manner it is by no means surprising that though we are first introduced to Wisdom by the primary impulses of Nature, afterwards Wisdom itself becomes dearer than are the impulses by which we came to her."<sup>13</sup>

As one beholds M. Brunschvicg's remarkable effort at philosophic synthesis, one begins to realize the growing complexity of modern thought, a complexity to which the doctrinaire schools of philosophy pay little heed. The problem is not so simple as realism vs. idealism, any more than the problem of political government in America is exhausted by the alternative of the Republican or Democratic parties. Nor is the practical solution of pragmatism of much use to the student who is interested in understanding reality in all its refinement and subtlety.

There is indeed no alternative than to study each phase of modern thought in its historical becoming. It is a task requiring encyclopedic knowledge and more than that, the artist's power of creative synthesis. For the philosopher, too, is an artist, having in his charge the continual remoulding of the intellectual and moral consciences of humanity.

<sup>12</sup>*Ibid.*, p. 610.

<sup>13</sup> Cicero, *De Finibus*, III, 7. Cf. Brunschvicg, p. 614.