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BLAKE AND THE MILLS OF INDUCTION

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It has been said that what characterized the eighteenth century as the "Age of Newton" was not so much "its physics or metaphysics, as . . . its conception of the aims and methods of science." It "was Newton's inductivism and experimentalism . . . rather than his optics or his mechanics that motivated the leaders . . . of eighteenth-century English intellectual history."¹ When doubts arose during the century concerning the new science, they were certainly not about its results, nor necessarily about its metaphysical implications, the impact of which was not fully felt until the nineteenth century, but its methodology. The empirical philosophy which came to prominence with the successes of experimentalism had rejected traditional logic because its arguments were shown to be inevitably circular, but it soon appeared as if circular patterns of thought were also inherent in the scientific method. Blake's case against experimentalism tends to deal more exhaustively with its metaphysical implications as his vision develops; but in his earliest writings he employs circular imagery to describe those logical difficulties confronting the method itself, the implications of which were far-reaching for the Enlightenment's hope for continued progress promoted by the advancement of science. Blake's larger purpose in attacking the logic of experimentalism was therefore to re-affirm the idea of scientific progress in light of explanations which implied that science could succeed only within an essentially fixed and stable world order.

The works of Bacon, Newton, and Locke had demonstrated the need for a new logic to replace that of the schoolmen. Bacon may be considered for our purposes the first to significantly criticize Aristotelean logic and syllogistic deduction in particular, contending that these methods of reasoning were without "issue," incapable of advancing scientific inquiry because they did nothing more than lead men through mazes of circular argumentation: "[A]ll hitherto done with regard to the *Sciences*," he complained, "is vertiginous, or in the way of perpetual rotation."² Writers coming after Bacon would repeatedly use images of circles to expose the limitations of traditional logic. Of special interest is the image of the mill which, when serving as a negative emblem, is central to Blake's depictions of rational processes. Locke himself used it to caution against circumscribing the quest for knowledge--typically comparing the new approach to learning with geographical exploration:

I do not say, to be a good geographer, that a man should visit every mountain, river, promontory, and creek upon the face of the earth . . . ; but yet everyone must allow that he shall know a country better that makes often sallies into it and traverses up and down, than he that like a mill-horse goes still round in the same track. . . .³

The mill image makes a similar appearance in a 1774 article by Thomas Reid entitled, "A Brief Account of Aristotle's Logic." By then this kind of accounting had become rather common. Reid points to the "slow progress of useful knowledge, during the many ages in which the syllogistic art was most highly cultivated as the only guide to science, and its quick progress since that art was disused. . . ." The ancients, he adds, seem to have had too high a notion of "the reasoning power in Man":

Mere reasoning can carry us but a very little way in most subjects. By observation, and experiments properly conducted, the stock of human knowledge may be enlarged without end; but the power of reasoning alone, applied with vigor through a long life, would only carry a man round like a horse in a mill, who labours hard but makes no progress.⁴

Blake appears to have adopted the very concerns and some of the same metaphors of empirical philosophy in his criticism of it. Urizen, described as "Self-closed," "self-contemplating," and "unprolific" (*The Book of Urizen*, E 69),⁵ calls to mind Bacon's description of the sciences as rotating back upon themselves and without issue. Blake repeatedly portrays Urizen's observations as "explorations"; and also warns, as do Locke, Reid, and others, that "none by travelling over known lands can find out the unknown" ("All Religions are One"). But most significantly, he employs images like the mill to indicate that the fruitless process of reason's "dull round" may describe aspects of experimentalism ("There is No Natural Religion") and to suggest furthermore the degenerative effects of all such mental drudgery, whether old or new. For at another point from a mill is brought forth "the skeleton of a body, which in the mill was Aristotle's Analytics" (*The Marriage of Heaven and Hell*, E 41). By encompassing the logic of experimentalism as well as that of Aristotle, the mill serves to deny the very distinctions it served to

clarify in the new philosophy. For Blake's strategy was to turn the charge of question begging, of circular reasoning, back upon the new logic itself in order to undercut its one real claim to distinction, which was that the experimental method of induction was truly capable of proceeding beyond its own premises.

Since Bacon, philosophers had been building a case for the empirical method by showing how neither the syllogism nor the induction of Aristotle could, in Dugald Stewart's words, "possibly advance a single step in the acquisition of new knowledge. How different from both is the induction of Bacon, which, instead of carrying the mind round in the same circle of words, leads it from the *past* to the *future*, from the *known* to the *unknown*?"⁶ Stewart distinguishes between what have come to be known as "summative" (sometimes and variously called "complete," "explicative," or "perfect") and "ampliative" induction. The distinction was thought to be crucial. In summative induction conclusions are based upon an examination of each and every particular item within the category about which the general assertion is being made. Strictly speaking, this seems to be the only kind of induction Blake recognized. He defined it as "the ratio of all we have already known" ("All Religions"), indicating by the word "all" that the induction alluded to is complete. Thus in "an inference from induction, if the enumeration be complete, the evidence will be equal to that of a perfect syllogism. . . ."⁷ The problem, of course, is that since summative induction amounts to no more than an explication of all we have already known, it is therefore also like deductive logic in that it does not provide the means by which we may come to know more. It was believed, however, that Bacon had formulated and Newton employed a method for proceeding from known particulars to the generally unknown. Newton himself described it when he defined experimental philosophy as the method by which "particular propositions are inferred from the phaenomena, and afterwards rendered general by induction."⁸ "To Generalize is to be an Idiot," Blake said in characterizing a leading tendency of the age (Annotations to Reynolds, E 630), for it was specifically the type of ampliative induction Newton describes, which was thought to comprise the logical component of the experimental method, that Blake found unconvincing. And his statements regarding experimental science show he knew precisely the allegedly unique features of its inductive procedures: "In ignorance to view a small portion and think that All / And call it Demonstration blind to all the simple rules of life" (*Four Zoas*, E 396). All explanations of scientific induction as proceeding from the known to the unknown Blake understood to be simply illogical: "As none by travelling over known lands can find out the unknown. So from already acquired knowledge Man could not acquire more" ("All Religions").

Blake, however, was not alone in questioning the logic of the experimental method. Similar doubts had been expressed often enough in the latter part of the eighteenth century. To a great extent these doubts had been stirred up by critiques of the method which David Hume had put forth, and it is no coincidence that he based his argument on the same insight Blake arrived at: that the new logic, like the old, triumphed by means of circular reasoning:

We have said that all arguments concerning existence are founded on the relation of cause and effect; that our knowledge of that relation is derived entirely from experience; and that all our experimental conclusions proceed upon the supposition that the future will be conformable to the past. To endeavor, therefore, the proof of this last supposition by probable arguments, or arguments regarding existence, must be evidently going in a circle, and taking that for granted, which is the very point in question.

To say it [an inference] is experimental, is begging the question. For all inferences from experience suppose, as their foundation, that the future will resemble the past. . . . If there be any suspicion that the course of nature may change . . . , all experience becomes useless, and can give rise to no inference or conclusion.⁹

Whether or not Blake actually read Hume,¹⁰ he came to similar conclusions regarding the experimental method and comprehended with a more wide-ranging imagination its social and political implications. The scientific revolution of the seventeenth century was largely responsible for defining the idea of progress which, throughout the eighteenth century and beyond, generally implied the successive triumphs of rationality based upon the discovery of empirically verifiable truths. But if certain essential features of the unknown future had to resemble the known past to guarantee the applicability of experimental inferences, then conservatism, and not progress, had to be the major premise upon which the conclusions of empirical science were founded. Thus Urizen must first as tyrant stabilize the process of history and the course of nature so as to give consistency to science: He forms instruments to "fix"

The whole into another world better suited to obey
His will where none should dare oppose his will
himself being King
Of All & All futurity be bound in his vast chain
And the sciences were fixed[.] (*Four Zoas*, E 343)

Urizen's attempts to achieve demonstrative certainty also circumscribe the extent of his empirical observations. Forever confined to explorations of his own dens, the geography of which was designed and built to conform to his own laws, his research will necessarily confirm the validity of those laws. Travelling like a mill-horse, Urizen excludes from the field of study contrary occurrences, or else has them "bound" in service to the law. In other words, the presumed validity of scientific law tends to determine, *a priori*, the procedures of empirical observation itself. Urizen's scientific explorations are not devised for the purpose of discovery, but confirmation; that is, they comprise a limited search for those "objects" that will conform to pre-conceptions as to what constitutes scientific "evidence" and "proof": "I have sought for . . . a solid without fluctuation . . . , Urizen confesses (*Book of Urizen*, E. 70), revealing his predisposition to "discover" only measurable material objects.

If it were indeed true that science was based upon circular patterns of thought, then it could not possibly be a force for change, but just another means

of rationalization. Yet, attempts to explain the scientific method did not seem concerned with emphasizing that, on the contrary, science demanded independence of thought capable, when necessary, of creatively challenging conventional reasoning. Instead, writers of the eighteenth century were suggesting that the new inductive procedures, no longer regarded as so radically new nor even entirely rational, were still viable because mankind, either for example as a result of "common sense" (Reid) or "custom and habit" (Hume), was disposed to comprehend experience as essentially stable and predictable: "All inferences from experience . . .," Hume believed, "are the effects of custom. . . ." ¹¹ Blake probably had explanations such as these in mind when he wrote that what one had "to do to Prove that All Truth is Prejudice" was to conceive all knowledge in terms of "Demonstrative Science such as is Weighed or Measured" (Annotations to Reynolds, E 648). Somehow liberal and progressive ideas no longer seemed relevant to discussions of scientific methodology; and even liberals like Joseph Priestly were proposing that we have "always found it to be so [that the future will be like the past]; and, therefore, how can we suspect the contrary?" ¹² Yet, "Without Contraries is no progression" (*Marriage of Heaven and Hell*, E 34); and contrary to commonly held views, Blake was suggesting that science required a willingness to accept the possibility of a future radically different from the past.

Contrary progression was Blake's solution to the problem of circularity and his answer to those "conservative" justifications of scientific methodology; but before turning to it, we should first note that if the key element in his conception of a progressive science was something other than reason, then those doubts as to the supposed rationality of experimentalism pointed the way to something like a poetic, rather than a logical genius initiating advances in science. Stephen Hales, for instance, found it reasonable, when travelling from "the utmost Boundaries of those Things which we clearly know" to "the adjoining Borders of *Terra incognita*, . . . to indulge in Conjecture . . . ; otherwise we should make but very slow Advances in future Discoveries, either by Experiments or Reasoning. . . ." ¹³ And having demonstrated that no form of logic, including scientific induction, could reasonably proceed beyond its own premises, Hume proposed that the laws of the empirical sciences were based instead upon imaginative associations. There was simply no other conclusion to draw from the realization that 1) even the supposedly new logical procedures could not reasonably advance beyond the known and that 2) nevertheless, great and startling new discoveries had in fact occurred in the sciences: "As none by travelling over known lands can find out the unknown. So from already acquired knowledge Man could not acquire more. therefore an universal Poetic Genius exists" ("All Religions"). Blake's proof of the existence of a poetic genius is thus predicated upon his belief in the actual existence of a progressive science. For he did not doubt the capacity of modern science to advance human knowledge. He only argued that its progress could not be accounted for by resorting to notions like ampliative induction. Imaginative perception was the truly novel feature of the modern, empirical sciences which distinguished them from all

that had been previously done in matters of science and philosophy. It was the element without which even modern science would go round in circles:

If it were not for the Poetic or Prophetic character the Philosophic & Experimental would soon be at the ratio of all things, & stand still unable to do other than repeat the same dull round over again[.] ("Natural Religion")

With such statements Blake points to an irreconcilability between the logical and empirical elements of modern science. The Urizenic solution to these differences was, as we have seen, to impose a logical order upon observable reality, and his efforts were reflected in the persistent attempts of empirical philosophers to locate an essential continuity and consistency within human experience by speaking of habitual inferences and resemblances between past and future. The advantage of so defining progress as linear was that movement would then proceed entirely within a stable framework of reasonable expectations--a kind of Burkean growth process quite different from the radical notion of contrary progression. For Blake realized that movement that fulfills expectations must be going in circles; and believing that contraries ought never to be reconciled since they make for progress, he regarded this irreconcilability within the method not as a problem requiring resolution, but as the very source of scientific progress. Progress depended neither upon the certainty nor the permanence of the demonstrations of experimentalism. For the essence of modern science lay, to the contrary, in its tendency to challenge continuously all rational demonstrations, while replacing them with "scientific truths" which were in themselves recognized to be "mutable . . . [,] true at one time and not at another. . . ." ¹⁴ Thus while the scientific method arrived at some genuinely new discoveries, seen by Blake as shifts in imaginative perception of reality, such discoveries had to be viewed as part of a dialectical process in which discovery functioned at one and the same time as a means of refutation: "What is now proved was once, only imagin'd" (*Marriage*, E 36); and for certain, what is now proved will inevitably be disproved: "Reason or A Ratio of All We have Known is not the Same as it shall be when we know More" (Annotations to Reynolds, E 649. Reynolds had just remarked that "reason is something invariable," for Blake an ancient and medieval belief that was no longer tenable within a scientific and progressive civilization.)

Karl Popper has noted in our century that it "is through the falsification of our suppositions that we actually get in touch with 'reality.'" Scientific "theories must be falsifiable: it is through their falsification that science progresses." ¹⁵ Similarly for Blake, the choice, upon which the ultimate regeneration of mankind depended, was between a science which afforded the security of certain knowledge, the "same dull round . . . , a mill with complicated wheels" ("Natural Religion"), or that which provided progressive enlightenment: "Science cannot exist . . . in generalizing Demonstrations of the Rationalizing Power. . . . Establishment of Truth depends on the destruction of Falsehood continually" (*Jerusalem*, E 203).

¹ L. L. Laudan, "Thomas Reid and the Newtonian Turn of British Methodological Thought," *The Methodological Heritage of Newton*, eds. Butts & Davis (University of Toronto Press, 1970), p. 104.

² "De Augmentis Scientiarum," *The Philosophical Works of Francis Bacon*, trans. Peter Shaw, vol. I (London, 1733), p. 4.

³ "Of the Conduct of the Understanding," *The Works of John Locke*, vol. I (Freeport, N.Y., 1969), p. 33.

⁴ *Thomas Reid: Philosophical Works*, vol. II (Hildesheim, 1967), p. 701.

⁵ All Blake quotations are taken from *The Poetry and Prose of William Blake*, ed. David V. Erdman (Garden City, 1970).

⁶ "Elements of the Philosophy of the Human Mind," *The Collected Works of Dugald Stewart*, ed. Sir William Hamilton, vol. III (Edinburgh, 1854), p. 258.

⁷ John Wallis, *Institutio Logica* (1715) as quoted in *Collected Works*, p. 257. Frye's statement that "the ratio of all we have already known" refers to "deductive reasoning" (*Fearful Symmetry* [Princeton University Press, 1958], p. 22) is not quite precise enough to reveal the point Blake is making about the failure of the "method of knowledge [which] is experiment" ("All Religions") to truly distinguish itself

from syllogistic reasoning.

⁸ *Mathematical Principles of Natural Philosophy*, trans. Andrew Motte, vol. II (London, 1729), p. 392.

⁹ "An Enquiry Concerning Human Understanding," *The English Philosophers from Bacon to Mill*, ed. Edwin A. Burt (New York, 1939), pp. 605, 606.

¹⁰ Hume's name appears in several of Blake's writings, and Blake was apparently aware of Hume's proposal that there was no rational basis for our belief that the sun will rise in the morning: "He [referring to Joshua Reynolds] may as well say that if man does not lay down settled Principles. The Sun will not rise in a Morning" ("Annotations to Reynolds," E 649).

¹¹ "Enquiry," p. 610.

¹² "Remarks on Dr. Reid's Inquiry," *The Theological and Miscellaneous Works of Joseph Priestly*, vol. III (n.p., n.d.), p. 58.

¹³ *Statical Essays*, vol. II (London, 1733), pp. xiii-xiv.

¹⁴ Thomas Reid, "Essays on the Intellectual Powers of Man," *Thomas Reid*, vol. I, p. 442.

¹⁵ *Objective Knowledge* (Oxford, 1972), pp. 360, 361.

THE VICISSITUDES OF VISION

THE FIRST ACCOUNT OF WILLIAM BLAKE IN RUSSIAN

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William Blake is essentially an English phenomenon, strange and bewildering to his contemporaries, barely of interest beyond the English-speaking world until more than a century after his birth in 1757. Even today, no contemporary copy of Blake's writings is known to be outside the Anglophone world of Britain, the United States, New Zealand, Australia, and Canada, and, though there are hundreds of articles and books on Blake in other languages, chiefly Japanese, they are mostly derivative and introductory. The poet called himself "English Blake,"¹ and so he is.

Interest in and information about Blake spread beyond the English Channel only very slowly. Aside from incidental references in bibliographies and directories,² the first account of Blake in German was in 1811, the first in the United States in 1830, the first in French in 1833, and even these were essentially English. Anon., "William Blake, Künstler, Dichter, und religiöser Schwärmer" in *Vaterländisches Museum*, 1 (January 1811), 107-31, was written by an Englishman, Henry Crabb Robinson,³ and Anon., "Hôpital des fous à Londres" in *Revue Britannique*, 3^e Série, 4 (July 1833), 179-87, is manifestly based

on, and confused from, Anon., "Bits of Biography. No. I. Blake, the Vision Seer, and Martin the York Minster Incendiary," *Monthly Magazine*, 15 (March 1833), 244-49.⁴ The early accounts of Blake in the United States are all simply extracts from or reprints of Allan Cunningham's life of Blake (1830).⁵ And there are apparently no accounts of Blake at all, not even incidental references to him, in Italy, Spain, or Holland or in other Romance or Germanic languages until well after 1863, when Alexander Gilchrist's *Life of William Blake*, "Pictor Ignotis" made him sensationally well known.

In these circumstances, it is astonishing to find an article on Blake in Russian as early as 1834, an article, moreover, which does not appear in any Blake bibliography and which is quite unknown to Blake scholars. What it says and how it got there are mysteries well worth pursuing.

When I was in Leningrad in 1973, I visited the great Saltykov-Shchedrin Library where Lenin had worked, to discover what they have on Blake, and found in due time that their surprisingly extensive Blake holdings included an article on the poet in *Teleskop* for 1834.⁶ When I first saw the *Teleskop* entry in the Saltykov-Shchedrin Blake list, I assumed that it must be misdated; indeed, I was

* The translation of the Russian account itself will appear in the journal of The University of Poona [India].