

IMAGERY FROM THE TECHNOLOGY OF THE INDUSTRIAL REVOLUTION
IN THE POETRY OF WILLIAM BLAKE

by

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INTRODUCTION

The purpose of this paper is to show that William Blake was aware of the technology of the Industrial Revolution and used that technology as a source of some of his poetic imagery. I have not attempted to discuss every industrial image. Such an attempt would, of course, be beyond the scope of this thesis. I have, therefore, selected some images and attempted to show their source in specific technological developments.

Other scholars, notably Brownowski, Erdman, and Blackstone, have recognized the necessity for studying Blake's poetry against the background of technological and economical changes. I have acknowledged my indebtedness to them throughout the paper. But their approach has been different from mine. They have used Blake's industrial and technological imagery to illustrate his philosophic, economic, and political ideas. I have used technology to explicate the images themselves.

In Chapter I, I have given examples to show how this approach can be helpful to an understanding of Blake's poetry. In Chapter II, I have indicated how and from whom Blake may have gained the knowledge of technology which he used. In Chapter III, I have shown some of the images drawn from measurement and from precision instruments. In Chapter IV, I have discussed wheel and mill images; in Chapter V, spinning and weaving images; and in the last chapter, images from the iron and steel industry.

CHAPTER I

Rattling, the adamantine chains & hooks
 heave up the ore
In mountainous masses, plung'd in the
 furnaces, & they shut and seal'd
The furnaces a time & times; all the while
 blew the North
His cloudy bellows¹

Where is this? It is not twentieth-century Detroit or Pittsburgh, but late eighteenth-century England -- William Blake's England. Throughout much of Blake's poetry there is this modern imagery: furnaces rage, bellows thunder, molten ore hardens into pigs, hammers beat on anvils, wheels turn, shuttles fly, and clouds of smoke lower over man laboring in the mill. In Blake's poetry there is an increasing appeal to us who are living midst the wheels and chains of the "dark Satanic mills."

The conflicts that rage in Blake's poetry are our conflicts. That man must lay aside the creations of the imagination to earn the necessities of the body, that the machines which can produce a high standard of living for the body can enslave the mind, that the factory and the assembly line can dehumanize men, that great wealth for a few can mean great poverty for many, that the price of material wealth is the sacrifice of the creative spirit, that the cost of economic prosperity is war -- these are the modern problems which dominate the Prophetic Books. Blake did not find a solution. But he did realize that industry could be fit material for poetry.

Blake was not the only poet to be aware of the technological advances of the period. Wordsworth at least acknowledged progress, but his "Steamboats, Viaducts, and Railways" lacks vigor, concrete imagery, and conviction. Dyer in The Fleece describes the wool industry from manuring the pasture to the flying shuttle -- all in blank verse. Erasmus Darwin in The Economy of Vegetation gives an account of the Albion Mill and "the triumphs of steam and machinery."² But Blake both saw the problems of industrialization and used technological progress as a source of poetic imagery.

This does not mean that Blake was a mad visionary genius who lived divorced from his own age. He saw these problems in his own culture, in which John Barry "Lived on Bread & Apples"³ while he was painting for the Society for the Encouragement of Arts, Manufactures, and Commerce: the society which was offering prizes for new inventions in the textile business. His age was the age of Watt, Cartwright, Cort; the age of the steam engine, the power loom, the spinning mule, the puddling furnace. In his lifetime Blake saw his England change from the land where he had "roam'd from field to field, / And tasted all the summer's pride"⁴ to the land of "Pits of bitumen . . . and / The land of snares & traps & wheels & pit-falls & dire mills."⁵ Blake was not only keenly aware of these changes; he also saw that these changes were the stuff of poetry.

Although he recognized the poetic possibilities of the Industrial Revolution, until recently scholars have not recognized the necessity of studying his poetry in relation to the social, political,

economic, and technological conditions of England during his lifetime.⁶ Although he was a craftsman who lived by his craft and worked to improve the technique of his craft, although he believed that electricity could cure his wife's rheumatism,⁷ the legend of Blake, the eccentric who attended fairies' funerals, the madman who lived with the spirit of his dead brother, the genius who saw strange and awful visions, has persisted. He is to many "the mystic who lived the largest part of his life in the world of his visions."⁸ In undergraduate survey of English literature courses, for example, he is sometimes presented as a finger bowl of the eighteenth century and sometimes as an appetizer to the Romantic Movement. He is at best remembered as the poet between the Neoclassic Period and the Romantic Movement who wrote some charming lyrics and saw a tree full of angels. At the worst he is dismissed as a man who hid in his poor rooms, disdainning the material and scientific world and writing incomprehensible poetry full of obscure imagery.

Part, at least, of this obscurity results from the reader's failure to look for the source of the image in the mundane world; a failure to see the source is often a failure to see the image itself. It is easy to see that Blake is using his own craft of engraving for his imagery when he explains how he will expunge old and false notions: "this I shall by printing in the infernal method, by corrosives, which in Hell are salutary and medicinal, melting apparent surfaces away, and displaying the infinite which was hid."⁹ But a line such as "Casting their sparkles dire abroad into the dismal deep"¹⁰ can be obscure if deep is read to mean ocean. We are left wondering what sparkles in what

kind of ocean. The next lines,

For, measur'd out in order'd spaces,
 the Sons of Urizen
 With compasses divide the deep; they
 the strong scales erect
 And weigh the massy cubes¹¹

do not seem to refer to an ocean, but to a coal mine.

It was during Blake's lifetime that the need for a substitute for charcoal became acute. England had lost the American forests and her own were being depleted. War and the increased use of iron demanded more fuel. With improvements in steam engines to pump the water out, coal mines could be dug to greater depths. One device to solve the problem of illumination in these deeper shafts was the steel-mill, or flint-and-steel mill, invented by Charles Spedding between 1740 and 1750.¹² "A boy, standing by the hewer, caused a small-toothed wheel to revolve against a flint, and so produce a shower of sparks."¹³ These sparks gave a poor light, but increased in size and luminosity in inflammable air.¹⁴ Blake's words "sparkles dire" and "dismal deep" were well chosen to describe an eighteenth-century coal mine. Few places could be as dismal; the sparkles were dire because the steel-mill "could and did cause explosions"¹⁵ by igniting the gas in the mine. The image is clear and accurate, but only when we accept the steel-mill as the source.

The same lines convey the secondary image which suggested itself to Blake when he used the first image. The secondary image is a result of a play on the words deep and scale. Another method of lighting coal mines was the use of "the phosphorescent glow from decaying

fish."¹⁶ With a different denotation, scale strengthens the image of a fish and deep can be accepted as ocean. But the second image is possible only if we start with the steel-mill.

Other scholars have, of course, mentioned the relationship between Blake's poetry and the technological progress of his time. Blackstone, for example, has pointed out a connection between Blake's Albion and the Albion Mill with its "sun and planets gear."¹⁷ S. Foster Damon states that Blake "searches warfare and the Industrial Revolution for illustrations" for the triumph of error,¹⁸ but he does not elaborate on them. Bronowski uses many images drawn from industry to illustrate his interpretation of Blake's poetry as a social document.¹⁹ Erdman, too, has noted many relationships between the poetry and the Industrial Revolution, but he is concerned with the poetry as history.²⁰

In this paper I am concerned with another question: How is technology transformed into poetry? Such a study can not only give a greater appreciation of Blake's works, but can also explain some of the obscure images. A study of technology as a source of imagery is the purpose of this paper. I have used the terms image and imagery in the wide sense to mean any aesthetic appeal to the sensual perception. The image is that which objectifies experience. By technology I mean the science or study of any practical, or useful, industrial arts or skills. By Industrial Revolution I mean that period in England between 1750 and 1830, the period which saw the rise of the factory system.

I have said that Blake is a "modern poet." His age was the beginning of our age, of problems and conflicts which are still with us.

Anita Brenner's phrase, the modern before the moderns,²¹ is more accurate than Pre-Romantic when discussing the Prophetic Books. I do not like the term Pre-Romantic to describe Blake. It indicates a continuation of characteristics or ideas. True, his early works are Romantic, but his major works are closer to Whitman or Sandburg than to Wordsworth or Coleridge. Blake, more than the Romantics who followed him, has something to say to twentieth-century man. I believe it urgent that we listen as well as we can. That I may contribute to a clearer understanding of what he has to say is my justification for this paper. I do not intend to argue whether or not he was a mystic. Others have done that.²² Nor do I wish to argue whether he was for or against industrialization. That, too, has been done.²³ I shall discuss his attitude towards industry and technology only in as much as it affects the poetic image. I should state that the images of technology do not dominate Blake's poetry. His chief sources of imagery are the Bible and the English countryside.

CHAPTER II

I write in South Molten Street what
I both see and hear
In regions of Humanity, in London's
opening streets.¹

The question may arise: How much did Blake know about the technology of the Industrial Revolution? We know he never saw the iron works at Carron, the steam engine factories at Birmingham, nor the cotton factories at Nottingham. Except for the three years spent at Felpham, where he worked for Hayley, his life was lived in London, which he did not have to leave to be aware of the changes in technology and industry which took place during his lifetime, for it was a boom town of the Industrial Revolution. From 1750 to 1881 the population per square mile in Middlesex County increased from 2,283 to 10,387.² It was the tool-making center; as a young man, James Watt learned instrument-making there,³ where his sun-and-planet gear was used in the Albion Flour Mill.⁴ London was the scene of experiments with the locomotive,⁵ the home of Cort, the site of the Spitalfield silk mills, which could have used many of the processes designed for the manufacture of cotton.⁶

Blake was not only in the vicinity of these technological advances, but he also knew men who, like many of the eighteenth century, were dabblers in experimental science. Trying to trace friendships and acquaintances may be as difficult as tracing the circles formed when a handful of stones is thrown into a pool: from the individual centers moving circles radiate outward, touching others which in turn meet many

others. I wish to reject the idea, advanced by Crabbe and Tatham, who, after all, knew Blake when he was an old man, that Blake had always been a recluse. If he went off to Paradise to draw his visions, he returned to earth to earn a living; if he wandered off to attend fairies' funerals, he came back to earthly dinner parties to startle the guests with accounts of the funerals.⁷ He did know many men who were interested in science and technology.

Through Flaxman he met Thomas Taylor the Platonist, for example, who, besides giving lectures on Plato and on the transmigration of souls, nearly burned down the Freemasons' tavern when he demonstrated his perpetual movement invention.⁸ At Mrs. Mathew's⁹ and at Joseph Johnson's, Blake met Joseph Priestley, the discoverer of oxygen, whom Blake caricatures as Inflammable Gass the Wind-finder in "An Island in the Moon."¹⁰ Either Priestley or Joseph Johnson could have been his connection with the Lunar Society of Birmingham, which included Erasmus Darwin, Watt, Priestley, Josiah Wedgwood, Boulton and others.¹¹ Furthermore, Blake did engravings for Darwin's Economy of Vegetation, which Johnson published.¹² Wedgwood knew Blake¹³ and engaged him to do engravings for his catalogues.¹⁴ It is also possible that Blake knew Josiah's son Thomas, who befriended William Godwin and Mary Wollenstonecraft (Blake knew them through Johnson and Taylor).¹⁵ Wedgwood was an experimenter with the camera obscura and photography. Inflammable Gass had a camera obscura in "An Island in the Moon." Thomas Wedgwood and Humphrey Davy published their experiments to fix the image as seen in the camera in 1802,¹⁶ a time when Blake was working on Jerusalem. Los

explains:

. . . but my Emanation, Alas! will
 become
 My Contrary. O thou Negation, I will
 continually compell
 Thee to be invisible to any but whom I
 please, & when
 And where & how I please, and never!
 never! shalt thou be Organized
 But as a distorted & reversed Reflexion
 in the Darkness.¹⁷

This may be an explanation of the emanations in Blake's mythology. The emanation is contrary -- faces the other way -- to the real being as the image in a camera faces the real object. The image in the camera has no real being but depends, as do Blake's emanations, on the real object. Only the real object can give meaning to the image. "I will . . . compell / Thee to be invisible to any but whom I please," as the image in the camera can have no existence without the object.

". . . never! never! shalt thou be Organized [be made, have existence] / But as a distorted & reversed Reflexion in the Darkness," as in the camera obscura the image of the real object is distorted by the lens, reversed (upside down and left to right), a reflection which exists in darkness.

Blake's distinction between seeing with the eye (intellectual perception) and through the eye (sensual impression) may be based on the difference between the human eye and the camera. The camera records through the lens -- the single vision which sees a thistle as a thistle; the human eye is the instrument by which the brain sees and imagines -- the thistle as "an old Man grey."¹⁸ If we can accept the idea that Blake was aware of Thomas Wedgwood's experiments with the camera

obscura, this distinction between seeing with and seeing through is sensible.

Other men who may have supplied Blake with technological information were Adam Walker and George Cumberland. Adam Walker was an inventor but apparently did not invent anything important enough to win a place in the Dictionary of National Biography. He was the son of a woollen manufacturer, who lectured on astronomy, established a seminary at Manchester, and travelled about giving scientific lectures.¹⁹ After his return from Felpham, Blake called on Walker to get information about Romney for Hayley. Walker was in Birmingham, but when he returned to London, Blake called on him several times and liked him.²⁰

When Blake first met George Cumberland is not known, but his first known letter to Cumberland, dated 1795, indicates that the two men were already friends.²¹ This letter, interestingly enough, is about the technique of an engraving process. Cumberland, too, was a dabbler in science. To him, rather than to Robert Blake's ghost, should be given credit for the idea of Blake's illuminated printing.²² In creating a new process, Blake was following the general tendency of his time to improve the arts and crafts.

It was during this period that the textile industry developed into large-scale manufacturing. Blake, we must remember, was born into the textile business. His father and his oldest brother were hosiers. Whether they made hose, put out hose to be made, or sold hose has not, to my knowledge, been definitely determined. Possibly they did all three during Blake's long life. Blake unquestionably had some first-

hand information about the spinning wheel and the stocking frame.²³ Blake's father seems to have been a fairly prosperous craftsman who could afford to send William to drawing school and to give him spending money for prints.²⁴ James, who inherited the business, "having a saving, somniferous mind . . . pestered his brother, the artist, with timid sentences of bread and cheese advice, got together a little annuity, upon which he supported his only sister . . ."²⁵ The phrasing suggests poverty or at least a fear of poverty. Did Blake in his own family see the ruin of the small craftsman by the growing industrialism? Perhaps much of his bitterness towards the mill was caused by the change in his family's fortunes.

It is not enough to indicate that Blake lived in the midst of the Industrial Revolution and to show that he knew the inventors and scientists who contributed to the Revolution. Thousands of men lived in London and knew of inventions without finding technology a source of poetic imagery.

A few examples²⁶ will demonstrate how the growing industry and the expanding technology whetted Blake's imagination. Everywhere in London's streets he saw and heard materials which he transmuted into poetry. "Energy," said Blake, "is the only life, and is from the Body."²⁷ These are the words of a man who was completely alive and aware of his sensations and his environment, not the words of a man who hid from the world. During the era of England's great canal building, Blake wrote, "in what Lock in the river of light confin'd / That issues forth in the morning by measure & in the evening by carefulness?"²⁸ and

"they dug the channels for the rivers."²⁹

The images from brick making and building illustrate Blake's sensitivity to activity in the mundane world.³⁰ The increase in population and the influx of people from the rural areas to industrializing London created a demand for more houses and thus for more bricks. In 1794 Blake moved to Hercules Buildings in Lambeth, where "open garden ground and field interspersed with a few lines of clean, newly-built houses lay all about and near; for brick and mortar were spreading even then."³¹ Mrs. George mentions the "chain of smoking brick-kilns [which] surrounded a great part of London."³² Vagrants often lived in the brick yards and cooked at the kilns.³³ Blake must have seen these poor creatures, for he wrote:

And Vala like a shadow oft appeared to
Urizen.
The King of Light beheld her mourning
among the Brick kilns, compel'd
To labour night & day among the fires;
her lamenting voice
I heard when silent night returns & the
labourers take their rest.³⁴

The demand for more brick had "raised the price of brick earth so greatly that the makers are tempted to mix slop of the streets, ashes, scavenger's dirt and everything"³⁵ with the clay for brick. The ashes were gathered by the dustmen.³⁶ Women "attended the dustcarts" and sifted cinders.³⁷ Blake saw these wretches also. His prayer for these women is also an accurate description of the work of the brick makers which he saw in his neighborhood.

O Lord, wilt thou not look upon our sore
afflictions

Among these flames incessant labouring?
our hard masters laugh
At all our sorrow. We are made to turn
the wheel for water,
To carry the heavy basket on our scorched
shoulders, to sift
The sand & ashes, & to mix the clay with
tears and repentence.³⁸

This is the prayer spoken by Vala, who symbolizes nature corrupted and exploited by Urizen, the symbol of man's reasoning power.

CHAPTER III

He [Urizen¹] form'd a line & a plummet
To divide the Abyss beneath;
He form'd a dividing rule;

He formed scales to weigh,
He formed massy weights;
He formed a brazen quadrant;
He formed golden compasses,
And began to explore the Abyss;²

In Blake's mythology Urizen is the symbol of reason separated from the other attributes of man: imagination (Los or Urthana), the body (Tharmes), and the passions or emotions (Luvah).³ These Eternals or Zoas (as Blake calls them) came into being by separation of and division from a harmonious whole -- the Eternal Man, who existed in eternity. This creature warred with itself and, dividing into the characters of Blake's mythology, fell into material existence in time and space. Then the male and female divisions begot children, who shrunk in the six days of creation to human size and form.⁴

As man shrunk into being, his eye contracted so that he could see as only one small separate creature. It was the duty of the poetic imagination (Los) to unite man, for the poet sees not with the contracting eye, but with the expanding eye, and to the poet

the visions remote
Of the dark separations appear'd:
As glasses discover Worlds
In the endless Abyss of space,
So the expanding eyes of Immortals
Beheld the dark visions of Los
And the globes of life blood trembling.⁵

The reference to the telescope is, I think, obvious. Blake's world, like ours, was a world of the telescope and the microscope. From 1785 to 1789 (The Book of Urizen was written in 1794) Sir William Herschel had worked to construct a 40-foot reflecting telescope which "became a true instrument of astronomical research."⁶ Pierre Louis Guinand's efforts to improve optical glass led to better lenses in both the telescope and the microscope.⁷ Other refinements, such as finer divisions of scales, turning and adjusting screws, resulted in greater precision in observational instruments.⁸ During Blake's lifetime man developed instruments which enabled him to see objects smaller than he had seen before and objects farther away. The world of the late eighteenth and early nineteenth centuries became figuratively both larger and smaller.

The Microscope knows not of this nor the
Telescope: they alter
The ratio of the Spectator's Organs, but
leave Objects untouch'd.⁹

Both instruments expand man's perception without altering the perceived.

If there is no limit on perception, man can expect

To see a World in a Grain of Sand
And a Heaven in a Wild Flower.¹⁰

In a letter to Thomas Butts, Blake explains that he saw particles of light as men who told him

. . . "Each grain of Sand,
Every Stone on the Land,
Each rock & each hill,
Each fountain & rill,
Each herb & each tree,
Mountain, hill, earth & sea,
Cloud, Meteor & Star,
Are Men seen Afar."¹¹

His eyes continued to expand

Till the Jewels of Light
 Heavenly Men beaming bright,
 Appear'd as One Man,

.12

In his Prophetic Books Blake is concerned with the problem of restoring man to the harmonious state before his fall. His use of one Immortal or Eternal Man to symbolize all humanity is not, of course, new. The Christian church has traditionally seen itself as a mystical body. But the paradox of modern history is this: The period that saw the rise of the factory system which ushered in the age of conformity was the same period that saw the rise of political theories which ushered in the age of individuality. Blake realized that man had to keep sight of the individual while he kept the vision of the whole, for

He who would do good to another must do it in
 Minute Particulars:
 General Good is the plea of the scoundrel,
 hypocrite & flatterer,
 For Art & Science cannot exist but in minutely
 organized Particulars
 And not in generalizing Demonstrations of the
 Rational Power.
 The Infinite alone resides in Definite &
 Determinate Identity.¹³

Both the man of art (Los) and the man of science (Urizen) must be concerned with the whole and the parts. The artist must strive for universality and be aware of the "minutely organized Particulars"; the scientist must know general theories and be aware of small details. The lenses of the telescope and the microscope furnished Blake with an apt metaphor for reconciling the paradox. As the instruments can be focused, so the vision, the "ratio of the Spectator's Organs" can be altered, but the objects remain the same. Blake was not trying to

change man, but the vision of man.¹⁴

The poet can expand his vision; the man of reason, as symbolized by Urizen, tries to fix the objects of perception into a system.

So he began to form of gold, silver & iron
 And brass, vast instruments to measure the
 immense & fix
 The whole into another world better suited
 to obey
 His will¹⁵

Blake's quarrel with the Age of Reason -- the age of Newton and Locke -- is that reason divides and sets limits on the divisions so that the whole of humanity is permanently divided and limited. Urizen, the weigher, the measurer, the classifier, has the same kind of mind as the assumed speaker in Auden's "The Unknown Citizen." Both represent a society which is interested in what can be mechanically measured, in what a man does or earns -- not in how he feels, in what he is.

Urizen is also the tyrant of uniformity who proposes

One command, one joy, one desire,
 One curse, one weight, one measure,
 One King, one God, one Law.¹⁶

Uniformity of measurement was necessary for technological progress. In 1783 James Watt wrote:

It is therefore a very desirable thing to have these difficulties [the problem of converting French measurements used by Lavoisier and Laplace to English equivalents] removed, and to get all philosophers to use pounds divided in the same manner, and I flatter myself that by me accomplished, if you, Dr. Priestley, and a few of the French experimenters will agree to it; for the utility is so evident that any thinking person must immediately be convinced of it¹⁷

A few years later, in 1789, a motion was made in the House of Commons

that a committee be appointed "to investigate and report on the best means of adopting an uniformity of weights and measures."¹⁸

Urizen is often associated with the words brazen and brass.¹⁹ "He formed a brazen quadrant." His horses "dash their golden hoofs / Striking fierce sparkles from their brazen fetters."²⁰ When he represents the measurer and weigher, the association seems to depend on the use of brass for precision instruments and on the use of brass rods for establishing the English yard. "One of the principal parts of the dividing-engine for circles . . . was a bronze wheel, cast in one piece."²¹ Brass was used in telescopes²² and quadrants and in balance scales.²³ "The suspension wires of the scale pans . . . began [in the middle of the eighteenth century] to be made of brass to eliminate the influence of variations in the humidity of the atmosphere."²⁴ Like the brass, Urizen, once he is formed, does not change; he believes in one law, one measure. He represents a fixed universe. Whereas, in Blake's mythology, this inability to change is a flaw preventing progress and correction of error, the stability of brass was useful in establishing the English yard. A straight brass rod, about thirty-eight or thirty-nine inches long and about an inch thick was made;

near each end of this rod; a fine point should be made, and a fine line drawn through it at right angles to the sides of the rod; the distance between the said points to be made the true standard length of the yard; . . . two gold studs or pins, to be fixed in the brass rod, or where the points were to be made which ascertain the length of the yard.²⁵

The gold pins may have suggested the "golden compasses," although Blake often associates gold and golden with commerce and trade,²⁶ and he may

mean that compasses could be used profitably in commerce, to make cogs and machine parts, for example.

After the original brass rod was proposed, the committee suggested that it be safely kept in a suitable box and that a second rod for ordinary use be made with "upright fixed cheeks."²⁷ After the two rods were made, they were laid in the same place with another rod of the Royal Society to prevent any "variation which the difference of air might make upon them . . . the next morning . . . [they were] found to agree as near as it was possible."²⁸

"An Island in the Moon" suggests that Blake had participated in informal scientific discussions. It is highly probable that he had heard of the efforts to fix the yard. Was his imagination stimulated by the thought of the brass rods lying in the dark while a committee waited to inspect any possible changes? I would like to suggest that this incident might have been the source of the lines:

He [Los] watch'd in shudd'ring fear
The dark changes [in Urizen], & bound
 every change
With rivets of iron & brass.²⁹

The fact that the rods were sealed up by the committee and then presented to the House of Commons may have suggested another action of Urizen: He writes his laws and secrets in the ". . . Book / Of eternal brass, written in my solitude;"³⁰ and seals up the book.

I do not mean to imply that Blake resented measurement or limit. He realized that they, like reason, were necessary to man. Even Los, the poetic genius, is "affrighted / At the formless, unmeasurable death."³¹ Perhaps Blake's best-known picture is that of the Ancient of Days posed

over the void with a compass. He was not opposed to science, for "Arts & Sciences are the Destruction of Tyrannies or Bad Governments" and "the Foundation of Empire is Art & Science."³²

Urizen, who

Times on times he divided & measur'd
Space by space in his ninefold darkness,³³

is merely the personification of eighteenth-century development of precision instruments. He can weep for "his Children ruin'd in his ruin'd World."³⁴ He becomes a tyrant only when he limits the function of the imagination, when he forces his children to live as seen with the contracted eye -- separate beings concerned only with the minute particulars of the mundane world -- when he denies them the expanded vision, when he divides and measures. Although he often seems to be a villain, he is a tragic hero who wanders in the cold and dark because, like Lear,³⁵ he divided and tried to measure that which cannot be measured.

I may not have adhered strictly to technology and imagery and may have digressed into philosophy. At points it is difficult to separate the imagery and the philosophy. There are two points which I wish to explain further. First, in the technology of observational instruments, Blake found a suitable image for an expanding vision which could see farther beyond reality and farther into truth than man had ever seen before. The image, not always clearly drawn, allowed him to focus on both the whole society and on one man. But these "instruments of vision" were also used to create a mechanical world in which machines bred machines. The microscope, for instance, was used for

position-finding in Ramsden's dividing-engine.³⁶ One need for a dividing-engine had been the need for greater precision in other instruments. There were also improvements in scales and surveying and navigating instruments.³⁷ Measurement was legally established. Blake saw his world becoming more complicated and more mechanical. He describes this world:

Others triangular, right angled course
 maintain. Others obtuse,
 Acute, Scalene, in simple paths; but
 others move
 In intricate ways, biquardate, Trapeziums,
 Rhombs, Rhomboids,
 Parallelograms triple & quadruple,
 polygonic
 In their amazing hard subdu'd course in
 the vast deep.³⁸

The second point is that out of this mechanical and complicated world which the technology of the Industrial Revolution had created, Blake drew one of his greatest images: Urizen, the personification of reason torn from imagination, the law-maker, the god of precision, the measurer and weigher, the divider. "He formed scales to weigh." I have explained the improvement in precision scales. "He formed a brazen quadrant." One improvement of the quadrant was to cast it in brass to eliminate differences of expansion of wood or iron and brass.³⁹ "He form'd a dividing rule." Ramsden's dividing-engine for wheels made finer graduations possible. One notable feature of this device was a bronze wheel.⁴⁰ Urizen, who is often associated with brass, is also associated with wheels. But with all his instruments he looks not with the expanding eye of the imagination. He does not see into nor beyond the mundane world. "He form'd . . . a plummet." His vision is

downward, and he explores the "Abyss beneath" -- the mines which gave England the materials for the Industrial Revolution.

From the technology of precision instruments Blake drew two important images: one, the expanding vision which enabled the observer to see both into and beyond his own sensual experience, that is, the microscope and the telescope; second, the personification of Urizen, that is, the necessity for uniformity, systems, classifications.

CHAPTER IV

And did the Countenance Divine
Shine forth upon our clouded hills?
And was Jerusalem builded here
Among these dark Satanic Mills?¹

Blake's mill and wheel images further indicate his growing awareness of industry as a source of imagery. His earliest use is a commonplace metaphor which expresses his dissatisfaction with a mechanistic universe and which he continued to use as a symbol of mechanical existence.

The bounded is loathed by its possessor.
The same dull round, even of a universe, would
soon become a mill with complicated wheels.²

In The Marriage of Heaven and Hell he mentions a mill but does not describe it.

. . . he [an angel] took me thro' a stable &
through a church & down into the church vault,
at the end of which was a mill: thro' the mill
we went, and came to a cave.³

The angel took him to a void where they beheld a vision of spiders and monsters in the "infinite Abyss." The angel apparently became frightened and returned to the mill. The vision became a pleasant scene. Blake returned to the mill to find the angel. They then travelled to the "void between saturn & the fixed stars." Here they saw another horrible vision: monkeys and baboons chained to a wall. The strong were devouring the weak. To escape the stench of the place, Blake and the angel "went into the mill," Blake taking a skeleton,

"which in the mill was Aristotle's Analytics."⁴ The repetition of mill shows that Blake was trying to give the word some significance, but the image is weak. The association with spiders, an image which he developed later, may indicate that even this early he was looking toward the spinning mills for imagery.

In 1793 he moved to Lambeth, a suburb on the south side of the Thames. Erdman states that if Blake went to London by way of London Bridge he passed a mill. "A contemporary print of the interior . . . [shows] a forest of large cogwheels and beams, employed in finishing some brass and iron cylinders that look like cannon barrels."⁵ In the works written at Lambeth and in his later work the wheel and mill images often appear. I should make it clear that by mill I mean not only flour mills, but also ironworks, foundries, and cotton mills. The word factory was not common until the middle of the nineteenth century.

Blake may have seen the Albion Flour Mill before it burned in 1791. This was also on the south side of the Thames near Blackfriar's Bridge.⁷ Blackstone considers this particular mill the source of Blake's "starry wheels."

"Albion" and "Mill" -- the two words become henceforth prime symbols in Blake's work of the enslavement of the human mind through machinery (the engines of Watt and Boulton) and rationalist philosophy (Darwin and the Lunar Society). The connection is still more precisely seen when we read of the rotative engine which operated in the Albion Mill, with its "sun and planets gear," and remember Urizen, "prince of the starry wheels," and the great Mill in which he set the Sons of Albion to toil unceasingly.⁸

Blake apparently had a flour mill in mind when he wrote in

America, "Let the slave grinding at the mill run out into the field."⁹
 In Vala Urizen's children are forced to work in a mill. Enion (The Mother) says that in the summer's sun "the slave grinding at the mill" is forgotten.¹⁰ Urizen orders his daughters to "Knead bread of Sorrow."¹¹ Tharmas repeats the cry, "Let the slave, grinding at the mill, run out into the field"¹² But the joy does not last. The Zoas are still struggling for supremacy of the whole man.

Then Dark Urthana took the Corn out of the
 Stores of Urizen;
 He ground it in his rumbling Mills.
 Terrible the distress
 Of all the Nations of Earth, ground in the
 Mills of Urthana.

. . . Thunders, Earthquakes, Fires, Water
 floods,
 Rejoice to one another; loud their voices
 shake the Abyss
 Their dread forms tending the dire mills
 . . . [men] in their utmost brain
 Feel the crushing wheels¹³

But "evil is all consum'd."¹⁴ Man is united; a paradise is established; and "sweet Science reigns."¹⁵

Here Blake consistently maintains his image of a flour mill throughout the poem. Blackstone is right in pointing out the relationship between Urizen and the Albion Mill. There is little question that the mill is not the traditional or Biblical mill, but the Albion Mill of industrial England. The sun-and-planet gear used in the Albion Mill was patented in 1781 by James Watt. Its purpose was to convert the up-and-down motion of the piston of the steam engine to rotary motion.

It consisted of a spur-wheel keyed to the end of the driver, and geared with a similar non-rotating wheel fixed to the end of a connecting-rod hanging from the beam, the wheels being kept in gear by a link joining their centres: the shaft would thus make two revolutions for each double stroke of the engine. The sun-and-planet motion was used for all Boulton and Watt rotative engines until . . . 1794.¹⁶

It is highly probable that this gear suggested the "starry wheels." Not only this gear but many wheels of the Industrial Revolution could have suggested Blake's repeated image of

. . . cruel works
Of many wheels I view, wheel without wheel,
with cogs tyrannic
Moving by compulsion each other¹⁷

There are other words in the extended mill image of Vala which are worth noting. Blake speaks of the "rumbling Mills." He then intensifies rumbling with "Thunders, Earthquakes," which indicate noise and vibrations, and with "Fires, Water floods / Rejoice to one another." Although these may represent the four elements of air, earth, fire, and water, it seems clear that Blake had a steam engine in mind, for the functions and noises of an engine would occur together, "Rejoice to one another." These "dread forms" are not the mill, but tend the "dire mill"; they are the steam engine which causes the mill to work. Although many other images crowd the pages of Vala, the image of the steam-engine-driven flour mill is clear and consistent.

But Blake's wheel and mill images are not limited to the flour mill. As the Industrial Revolution progressed, the picture of wheels and mills increased in his poetry. Although the patent for Watt's sun-

and-planet gear expired in 1794, Blake continued to use the starry wheels as sources of energy. They are usually accompanied by images of noise and smoke or clouds.

Loud roll the Starry Wheels of Albion into
 the World of Death,
 And all the Gate of Los, clouded with clouds
 resounding from
 Albion's dread wheels, stretching out spaces
 immense between,
 That every little particle of light & air
 become opaque
 Black & immense18

Here is an early description of industrial smog. Blake associates the wheels with furnaces. "The Starry Wheels revolv'd heavily over the Furnaces."¹⁹ These furnaces are not merely the fires to evaporate water for the steam engines. They are the creative furnaces of the iron industry, "for the contrivance [Watt's steam engine] was used to raise water to turn the great wheels which operated the bellows, forge hammers, and rolling mills."²⁰

The wheels and gears gave Blake a concrete image for his idea that "Without Contraries is no Progression."²¹ In his printing press Los "lays his words in order above the mortal brain; / As cogs are form'd in a wheel to turn the cogs of the adverse wheel."²² Los of the printing press is Blake himself, who engraved his own works and who believed he had visions of truth "above the mortal brain." The machine image is one of movement, of progress, although the wheels move adversely, contrariwise. In describing the Eastern Gate of Golgonooza, he uses the same image. The ornaments of the gate take "their forms from the Wheels of Albion's sons as cogs / Are form'd in a wheel to fit

the cogs of the adverse wheel."²³ The emphasis is not on the movement, but on the precision of machine-making which makes movement possible. Wheels are a symbol of energy. They are "Satanic Wheels," and Satan is energy. The furnaces turn "upon the Wheels of Albion's sons with enormous power" ²⁴

Blake saw this power of the mill, and the wheels became master of man. He saw the ". . . hour glass contemn'd because of its simple workmanship . . . the water wheel / That raises water into Cisterns, broken & burn'd in fire" ²⁵ The steam engine had been originally used to pump water. But in its use to drive other machines, Blake saw the complexity of industry. Instead of the simple instruments and tools, technology

. . . intricate wheels invented, Wheel without
wheel,
To perplex youth in their outgoings & to bind
to labours
Of day & night the myriads of Eternity, that
they might file
And polish brass and iron hour after hour²⁶

There was no longer hope that "sweet Science" would reign. The mill is ". . . intricate, dreadful / And fill'd with cruel tortures."²⁷

Jerusalem, ideal England, was caught in the trap.

Los beheld the mild Emanation, Jerusalem,
eastward binding
Her revolutions toward the Starry Wheels
in maternal anguish,
Like a pale cloud²⁸

She wandered with Vala (corrupted nature) over the land and "sat at the Mill . . . her reason grows like the / Wheel of Hand incessant turning day & night" ²⁹ She had "been deluded by the turning mills. . . ." ³⁰

Work-houses of Og & Anak,"³⁶ asks, ". . . was Jerusalem builded here /
Among these dark Satanic mills?"

Blake's mill and wheel imagery grew as the Industrial Revolution progressed. The technology of it gave images which he repeatedly used: the steam-driven mills, the association of wheels and furnaces, starry wheels, the cogs, and the association of mills and looms.

CHAPTER V

They [Eternals] began to weave curtains
of darkness,
They erected large pillars round the Void,
With golden hooks fasten'd in the pillars;
With infinite labour the Eternals
A woof wove, and called it Science.¹

The great changes which Blake saw take place in his England were brought about mainly by the improved technology of two industries: the textile and the iron and steel. It is not by chance, then, that one of the great creative forces in the Prophetic Books is a spinner and weaver. The later writing abounds in images of looms, spinning wheels, spindles. Although many of these images are not directly related to specific patents and many are drawn from even primitive methods of spinning and weaving, there are some images which indicate that Blake had the machines of the Industrial Revolution in mind.

In the lines from The Book of Urizen quoted above, there are the seeds of many of the later images. First, there is the association of the textile industry with science, which, as represented by the Royal Society, was concerned with the problem of producing a cheap, strong cotton warp. Jenny-spun yarn made better woof than warp.² This cotton woof was often woven through a linen warp. Crompton's mule could weave both woof and warp of cotton.³ When we remember that many of the inventions of the Industrial Revolution were specifically designed for cotton manufacture, we can see the association between "woof wove" and "Science." Blake does not limit himself, however, to the cotton

industry; he mentions flax. For example, Tharmas asks,

Why wilt thou Examine every little fibre
of my soul,
Spreading them out before the sun like
stalks of flax to dry?⁴

But this, of course, is not new technology, for the initial stages of the processing of flax had not changed.

Second, there is the image of darkness, which Blake continues to use with looms. Third, there is "the Void," which later becomes wheels: ". . . the abstract Voids between the Stars are the Satanic Wheels."⁵ Last, there is the word golden, which often is used with the looms.⁶

Although these lines can suggest a simple hand loom, they do, as I have said, carry the seed of many images which Blake developed as the textile industry advanced. The "curtains of darkness" became the smoke from the power-loom; the "infinite labour" became the fourteen- and sixteen-hour day for the factory worker; "the Void" became the Satanic mill with its wheels; the woof called science, the creation of the material world, became our scientific materialistic culture. Therefore, the student of Blake should consider the technology and its results in order to perceive all of the images in such lines as

The Male is a Furnace of beryll; the
Female is a golden Loom.
I behold them, and their rushing fires
overwhelm my Soul
In London's darkness⁷

Here, too, the word loom could mean either a primitive or a highly complex loom, but a careful examination of the lines indicates that Blake was thinking of a power loom. The word their refers to both furnaces and looms. The fires, then, must mean steam engines, for no

other fire would be necessary with a loom. Rushing emphasizes the idea of speed and enforces the image of a power loom run by a steam engine. It is "a golden Loom" because it is profitable. The word darkness suggests smoke from the fires and is in sharp contrast with golden. For some the power loom was profitable, but Blake was overwhelmed by the machines and the darkness, or ignorance, which the Industrial Revolution brought to some.

He often focuses on the mill worker rather than on the machinery.

And one Daughter of Los sat at the fiery
 Reel, & another
 Sat at the shining Loom with her Sisters
 attending around,
 Terrible their distress, & their sorrow
 cannot be utter'd;
 And another Daughter of Los sat at the
 Spinning Wheel,
 Endless their labour, with bitter food,
 void of sleep;
 Tho' hungry, they labour; they rouze
 themselves anxious
 Hour after hour labouring at the whirling
 Wheel,
 Many Wheels8

Here there is no explicit connection with any particular patents or inventions. Yet this is not a picture of a family but of a mill. The reel is fiery -- a suggestion of the steam engine. It is a shining (golden) loom. The sisters do not attend each other, but sit, attending many wheels. The long hours, the weariness, the poor food, the terrible distress, and unspeakable sorrow suggest a factory or competition with a factory.

One invention which did catch Blake's imagination was John Kay's

flying shuttle. This device, which had been invented much earlier (between 1733 and 1738), increased production of cloth and created a demand for spinning machines to keep up with the weavers. Kay designed a box on each side of the loom for the reception of the shuttle. In each box there was a picker (a piece of wood or leather) threaded on a spindle. The pickers were connected by cords which the weaver held in his hand by a small handle, called a fly pin. The weaver could project the shuttle across the loom through the shed (the opening between the two sheets of yarns) by a sharp jerk of the fly pin. As this process could be done with the right hand, the left was used to beat up the woof.⁹ This is the source of Los' touching the strings with his left hand.

In Blake's poetry this device appears as the "wing'd shuttle" and allows Blake to impose an image from nature on an industrial image.

And all the time, in Caverns shut, [the Lions
of Urizen] the golden looms erected
First spun, then wove the Atmospheres; there
the Spider & Worm
Plied the wing'd shuttle, piping shrill thro'
all the list'ning threads;
Beneath the Caverns roll the weights of lead
& spindles of iron,
The enormous warp & woof rage direful in the
affrighted deep.

The threads are spun & the cords twisted &
drawn out; then the weak
Begin their work, & many a net is netted,
many a net
Spread, & many a Spirit caught: innumerable
the nets,
Innumerable the gins & traps, & many a
soothing flute
Is form'd, & many a corded lyre outspread
over the immense.

In cruel delight they trap the listeners,
 & in cruel delight
 Bind them, condensing the strong energies
 into little compass.¹⁰

Although Blake piles image on image, he never loses sight of his original vision, a spinning and weaving mill. Actually the two processes were not usually done in the same place, but Blake puts them together because in his poetry they are one act of creation. Here is a compact picture of the Industrial Revolution: the concentration of production in one place, the adaptation or specialization of machines, the iron parts.

The "weights of lead" refer to the weights which were used to adapt Arkwright's cotton spinning machines to linen manufacture.¹¹ The "spindles of iron" represent the use of iron for factory parts. Crompton's mule may explain the "cords twisted & drawn out." An important feature of the mule was the movable carriage which "was drawn out for a distance of 54 to 56 inches from the roller beam -- this is known as the draw -- in order to stretch and twist the yarn."¹²

The "wing'd shuttle" suggests a bird, and Blake imposes a nature image which emphasizes the mechanical. To the bird he adds the spider and the silk worm, both symbolic of spinning and weaving. But in nature the spider preys upon the fly and is preyed upon by the bird.

The Spider sits in his labour'd Web, eager
 watching for the Fly.
 Presently comes a famish'd Bird & takes
 away the Spider.
 His Web is left all desolate that his
 little anxious heart
 So careful wove & spread it out with
 sighs and weariness.¹³

One may argue whether or not this passage is a reference to the replacing of the home weaver by the mechanical power mills. The web left desolate brings to mind Goldsmith's The Deserted Village. But such argument is not relevant here. It is sufficient to point out that all nature has been corrupted by the division of Eternal Man. Vala and the famished bird are both pitiful victims. The bird is not Shelley's skylark, but a creature who must devour life in order to live.

The point I wish to make is that Blake uses a mechanical device for more than one poetic purpose. The connotations suggested in the image of the spinning and weaving mill are better appreciated if we remember that Blake started with a vision of a mill.

"Piping shrill" and "the weak" suggest children. The image shifts again but not away from the looms. The spider and the worm are the children who worked in the factory. And though they "plied the wing'd shuttle," they were prey of it. The shuttle is part of the "golden loom" which was owned by the manufacturer who exploited the children.

The children, the bird, the shrill piping have aroused the sound of music and the flute; the loom with the listening threads becomes a lyre. Here is a dual image: the happy children of nature, the exploited children of the mill; innocence and experience; England as she should be, England as she is; Jerusalem and Babylon.

But Blake does not leave the mill. He does not say that the shuttle is a bird, for the bird has been torn from its spirit as the Eternal Man was torn apart. The real, or mortal, bird lives in nature

by killing. The spirit, or poetic value, the flying principle which symbolizes freedom and liberty, has been transferred to a mechanical device which cannot contain it. Therefore, the spirit is enslaved. "Many a spirit caught" refers also to the children. Because their spirit cannot be contained in the mill, they are spiders and worms.

The "wing'd shuttle" appears in other images as a symbol of a bird and of enslavement. Jerusalem says she hears Vala's

". . . shuttle sing in the sky and round my
limbs
"I felt the iron threads of love & jealousy
& despair."¹⁴

It becomes a symbol of the trapped which weaves more nets and gins to further ensnare itself.

Of all his spinning and weaving images, Blake is indebted to technology for two important ones which appear again and again in his poetry: the association of the loom and fire, which produces a strong image of the tremendous creative force with the connotation of destruction; and the flying shuttle, which sharpens the contrast between nature and the machine.

CHAPTER VI

What the hammer? what the chain?
In what furnace was thy brain?
What the anvil? what dread grasp
Dare its deadly terrors clasp?¹

In Blake's poetry the other great creative force, besides spinning and weaving, is pictured in images drawn from the iron and steel industry. One problem of eighteenth-century manufacturing was the production of good cheap cast iron. Charcoal-produced cast iron was superior to coke-produced iron, which was often brittle, but the forests were being depleted. One way to make good iron had been to rework the cast iron on an anvil, but this was expensive.

Blake's first version of "The Tyger" in the Rossetti Manuscript shows that Blake was experimenting with the idea of both a cast iron tiger and a wrought iron tiger, although the finished version does not indicate this. In the final version the third stanza reads:

And what shoulder & what art
Could twist the sinews of thy heart?
And when thy heart began to beat
what dread hand? & what dread feet?²

While it is easy to see that shoulder, art, and hand belong to the idea of making or twisting the sinews of the heart, it is difficult to see what the feet have to do with this idea. The words were left in merely to fill out the rime.

In the first draft the lines read:

And when thy heart began to beat
What dread hand & what dread feet

Could fetch it from the furnace deep?³

The beating heart of the tiger is conceived in a furnace. Here it is clear that the furnace is, for Blake, a source of creation, and fire a symbol of creation as well as destruction. The living heart of the tiger is taken from the furnace and steeped "in the well of sanguine woe" in the "horrid ribs."

And in thy horrid ribs dare steep
In the well of sanguine woe?⁴

These lines continue the blacksmithing imagery. The metal, having been worked ("twist the sinews") and heated in the furnace, is plunged into water ("steeped in the well").

In the next two lines of the stanza Blake shifts his image to cast iron.

In what clay & in what mould
Were thy eyes of fury roll'd?⁵

Although the shift is logical (it is more sensible to cast eyes than to work iron eyes), Blake was apparently dissatisfied with the stanza -- it has one line too many -- and omitted it from the second version.

In the next stanza, also omitted from the second version, Blake returns to the wrought iron imagery -- the hammer and anvil. Like the heart of the tiger, the brain is conceived in the furnace.

In what furnace was thy brain?⁶

The words burning bright, burnt, cruel fire emphasize the fiery creation. Blake sees the furnace and the anvil as instruments of creation, as well as restraint, as agents of creation as well as destruction.⁷

There is no such imagery in the creation of the lamb, the symbol

of innocence, for innocence is not created, but simply is. Experience must be worked for.

What is the price of Experience? do men
 buy it for a song?
 Or wisdom for a dance in the street? No,
 it is bought with the price
 Of all that a man hath⁸

There are those who think Blake preferred the lamb to the tiger. But Blake knew that no man can be and not experience. He also knew that experience is painful, repetitious, fierce, destructive, frightening, dynamic and creative, that men suffer through experience. The tiger is often a symbol of dehumanized mankind. Blake realized that industry could dehumanize mankind, but he looked into the furnaces and found images for his poetry. These images give tremendous strength and power to his work.

He uses the furnaces as places of creation. Orc, the personification of revolt, comes into being ". . . fierce glowing as the wedge / Of iron in the furnace."⁹ During Blake's life improved blast furnaces solved the problem of coke smelting.¹⁰ Blake presents a picture of the process of smelting. Luvah is here a symbol of iron; Vala coal.¹¹

Luvah was cast into the Furnaces of
 affliction & seal'd,
 And Vala fed in cruel delight the
 furnaces with fire.
 Stern Urizen beheld, urg'd by necessity
 to keep
 The evil dark afar & if perchance with
 iron power
 He might avert his own despair; in woe
 & fear he saw
 Vala incircle round the furnaces where
 Luvah was clos'd.
 In joy she heard his howlings & forgot
 he was her Luvah,

With whom she walk'd in bliss in times
of innocence & youth,
And when Luvah, age after age, was quite
melted with woe,
The fires of Vala faded like a shadow
cold & pale,
The evanescent shadow; last she fell, a
heap of Ashes
Beneath the furnaces, a woeful heap in
living death.

Then were the furnaces unseal'd with
spade, & pickaxes
Roaring let out the fluid: the molten
metal ran in channels
Cut by the plow of ages held in Urizen's
strong hand
In many a valley, for the Bulls of Luvah
drag'd the Plow.¹²

I am indebted to Erdman for his comparison of these lines with an 1801 account of a blast furnace.¹³ But I cannot agree with him that Blake was using the brick kilns as a source of the image. Erdman bases this assumption on the line: "last she fell a heap of Ashes / Beneath the furnaces" and states that the blast furnace had no ash pit. Some of the blast furnaces did have ash pits.¹⁵ In Jerusalem, written after 1800, the line is changed to "Vala comes from the Furnaces in a cloud."¹⁶ The change indicates that Blake was aware of changes in the furnaces.

Another image which he owes to the iron and steel industry is the association of cold, snow, and ice with the furnaces.

It was forg'd in mills where the winter
Beats incessant: ten winters the disk
Unremitting endur'd the cold hammer.¹⁷

The word winter strengthens the idea of endurance. In the next passage the association of furnaces and winter present an idea of two great

forces, heat and cold, meeting in a giant conflict for the souls of Luvah and Vala. There is also the concept of an inescapable fate. Heat and cold are opposites and yet work together to destroy and to create.

. . . Hark, I hear the hammers of Los,
They melt the bones of Vala & the bones of
Luvah into wedges;
The innumerable sons & daughters of Luvah,
clos'd in furnaces,
Melt into furrows; winter blows his bellows:
Ice & snow
Tend the dire anvils.¹⁸

The inherent conflict in the two elements emphasizes incessant activity.

. . . they shut and seal'd
The Furnaces a time & times; all the while
blew the North
His cloudy bellows¹⁹

This poetic image was derived from the notion that the blast for the furnace should be as cold as possible.²⁰ Some manufacturers even used ice in cooling the blast.²¹ Neilson's hot air blast was patented the year after Blake's death.²²

Another contribution of the Industrial Revolution to Blake's poetry was the increase in power. In the early poems Los, the blacksmith, works alone binding Urizen. In Jerusalem the iron work has increased so that he must force his Spectre to help him.

. . . Los compell'd the invisible Spectre
To labours mighty with vast strength with
his mighty chains,
In pulsations of time, & extensions of
space like Urns of Beulah
With great labours upon his anvils, & in
his ladles the Ore
He lifted, pouring it into the clay ground
prepar'd with art.²³

The works of creating are so great that men must work together in

factories and mills. They must heave up the ore with hooks and chains. In the early poems Orc was revolution. Luvah, earth, became the personification of iron. In the later poems Orc (revolution), Satan (energy), and Luvah (iron) become one. History has agreed with this synthesis by labeling the period of which Blake wrote the Industrial Revolution.

In the iron industry of this period, Blake saw Los, the personification of the struggles, the conflicts, the power of poetic creation. He realized, as much as any other poet of his time, that great changes were taking place. He did not propose that man flee back to another age, but that the poet use the material at hand to create a new world.

CONCLUSION

To understand a poem, one must see the images which the poet draws. For this reason the poetry of William Blake must not be studied divorced from his age. He looked to the looms, the mills, the furnaces of the Industrial Revolution for images to express his concept of the changes which occurred during his lifetime. The characters of his later poems have a dual function. On the psychological or individual level they are personifications of man's attributes. But on the social or universal level they personify forces at work in an industrial society.

Because Blake piles images drawn from various sources on top of each other, it is often difficult for his reader to comprehend all aspects of his ideas. One must be alert to several possibilities suggested by one image. I have pointed out a few examples of Blake's use of industry and have shown how interpretation depends on seeing the image. This is not a complete study of Blake's industrial imagery, but I hope it can lead to a more exact appreciation of his poetry.

NOTES TO CHAPTER I

¹William Blake, Vala or The Four Zoas, The Writing of William Blake, edited by Geoffrey Keynes, The Nonesuch Edition (London, 1925), II, 24. All quotations from Blake's works are from this edition unless otherwise stated. I have retained the spelling, capitalization, and punctuation of this edition, or of the 1932 edition, Poetry and Prose of William Blake.

²Bernard Blackstone, English Blake (Cambridge, 1949), p. 20.

³"Annotations to Reynolds," III, 6.

⁴"Song," Poetical Sketches, I, 8.

⁵Jerusalem, III, 183.

⁶Probably Jacob Bronowski's William Blake: Man Without a Mask (London, 1944) marks the beginning of the new interpretation of Blake.

⁷Letter to William Hayley, II, 281-285.

⁸Helen Gardner, Art through the Ages (New York, 1948), p. 672.

⁹Marriage of Heaven and Hell, I, 189.

¹⁰Vala, II, 26.

¹¹Ibid.

¹²Charles Singer, et al, (ed.), A History of Technology (New York, 1958), IV, 95.

¹³T. S. Ashton, The Industrial Revolution (London, 1948), p. 36.

¹⁴Singer, p. 95

¹⁵Ibid.

¹⁶Ibid.

¹⁷Blackstone, p. 19.

¹⁸S. Foster Damon, William Blake: His Philosophy and Symbols (New York, 1947), p. 191.

¹⁹Bronowski.

²⁰David Erdman, Blake: Prophet Against Empire (Princeton, 1954).

²¹Anita Brenner, "Blake: The Modern before the Moderns," New York Times Magazine, February 12, 1939, pp. 12-13.

²²Damon insists that Blake is a mystic. Mark Schorer in William Blake: The Politics of Vision (New York, 1959) denies the idea.

²³Bronowski maintains that Blake is opposed to industrialism and its attendant evils. Erdman asserts that Blake is opposed to industry only when it promotes war.

NOTES TO CHAPTER II

¹Jerusalem, III, 222.

²Arnold Toynbee, The Industrial Revolution (Boston, 1956), p. 9.

³Singer, p. 181.

⁴Blackstone, p. 19.

⁵Singer, p. 189.

⁶Ashton, p. 75.

⁷This story may be used to "prove" Blake's romanticism but it might indicate merely a sense of humor.

⁸"Taylor, Thomas," Dictionary of National Biography, XIX, 468.

⁹The existence of Mrs. Mathew is questionable. H. M. Margoliouth in "Blake's Mr. Mathew," Notes and Queries, CXCVI (1951), 162-163, points out that a Mr. Matthews did exist.

¹⁰Writings, I, 59-82.

¹¹Blackstone thinks that "An Island" is directed toward the Lunar Society. Personally I agree with Erdman, who sees the satire directed towards Blake and his friends.

¹²Blackstone, p. 19.

¹³Geoffrey Keynes, Blake Studies (London, 1949), pp. 68-69.

¹⁴Ibid., pp. 70-75.

¹⁵This has been questioned. See Harold Bruce, "William Blake and Gilchrist's Remarkable Coterie of Advanced Thinkers," Modern Philology, XXIII (1926), 285-292.

¹⁶"Camera Obscura," Encyclopaedia Britannica, 1910, V, 107.

¹⁷Jerusalem, III, 189.

¹⁸Letter to Thomas Butts, II, 207.

¹⁹Evelyn Bishop, Blake's Hayley (London, 1951), p. 110 n.

²⁰William Blake, Letters of William Blake, edited by Geoffrey Keynes (New York, 1956), pp. 111 ff.

²¹Ibid, pp. 30-31.

²²Mona Wilson, Life of William Blake (London, 1948), pp. 330-331.

²³For those who like autobiographical interpretation, it is interesting to note that in one version of his mythology Blake creates Los (The Poetic Genius), a worker in metals, and Enitharmon (Inspiration and Pity), the weaver, as siblings. Enitharmon can represent Miss Catherine Blake, as well as Mrs. Blake.

²⁴Alexander Gilchrist, Life of William Blake, edited by W. Graham Robertson (London, 1906), p. 5 ff.

²⁵Frederick Tatham, Life of William Blake, edited by A. G. B. Russell (New York, 1906), pp. 2-3.

²⁶I have selected a few examples only to show Blake's method of transmuting details of his environment into poetry.

²⁷The Marriage of Heaven and Hell, I, 182.

²⁸Vala, Poetry and Prose of William Blake, edited by Geoffrey Keynes (London, 1932), p. 432.

²⁹Vala, II, 20.

³⁰Erdman has pointed out Blake's use of brick making, p. 433.

³¹Gilchrist, p. 102.

³²Mary Dorothy George, Life in the XVIIIth Century (New York, 1925), p. 74.

³³Ibid.

³⁴Vala, II, 29.

³⁵George, p. 74.

³⁶Ibid., p. 76.

³⁷Ibid., p. 158.

³⁸Vala, II, 29.

NOTES TO CHAPTER III

¹The name Urizen was probably derived from the Greek ὄριζεν, to set a limit. See "Notes," The Complete Writing of William Blake, edited by Geoffrey Keynes (London, 1957), p. 895.

²The Book of Urizen, I, 318.

³Thomas Wright, Life of William Blake (London, 1929), I, 25.

⁴This, of course, is an extreme simplification of Blake's complicated system of creation. For a more comprehensive study, see Damon.

⁵The Book of Urizen, I, 314.

⁶Singer, p. 398.

⁷Ibid., p. 359.

⁸Ibid., p. 403.

⁹Milton, II, 350.

¹⁰"Auguries of Innocence," Poetry and Prose, p. 118.

¹¹Letter to Thomas Butts, Poetry and Prose, p. 1052.

¹²Ibid.

¹³Jerusalem, Poetry and Prose, p. 655.

¹⁴Schorer offers a lucid explanation of Blake's fourfold vision, pp. 5-10.

¹⁵Vala, II, 70.

¹⁶The Book of Urizen, I, 307.

¹⁷Quoted in A History of Engineering by A. P. M. Fleming and H. J. Brocklehurst (London, 1925), p. 27.

¹⁸Ibid.

¹⁹Northrop Frye, in Fearful Symmetry (Princeton, 1958), pp. 277-278, associates Urizen with gold, but explains that in Vala, Night III deals "with the fall of Urizen and the end of the Brazen Age."

²⁰Vala, II, 74.

²¹Singer, p. 392.

²²Ibid., p. 390.

²³Ibid., p. 400.

²⁴Ibid., pp. 404-405.

²⁵Fleming, pp. 19-20.

²⁶Blake's use of the words gold and golden is not limited to commerce and trade. They often signify beauty or peace.

²⁷Fleming, p. 20.

²⁸Ibid.

²⁹The Book of Urizen, I, 310.

³⁰Ibid., p. 307.

³¹Ibid., p. 309.

³²"Marginalia" to Reynolds' Discourses, Poetry and Prose, p. 970.

³³The Book of Urizen, I, 304.

³⁴Vala, II, 67.

³⁵Erdman also sees Urizen as a Lear figure, pp. 120-122, 344-346.

³⁶Singer, p. 392.

³⁷Ibid., p. 400.

³⁸Vala, I, 31.

³⁹Singer, p. 400.

⁴⁰Ibid., p. 392.

NOTES TO CHAPTER IV

- ¹Milton, II, 306.
- ²There Is No Natural Religion, I, 131.
- ³The Marriage of Heaven and Hell, I, 191.
- ⁴Ibid., p. 193.
- ⁵Erdman, p. 313.
- ⁶Blake does not use the word factory.
- ⁷Blackstone, p. 19.
- ⁸Ibid.
- ⁹America, I, 264.
- ¹⁰Vala, II, 35.
- ¹¹Ibid., p. 77.
- ¹²Ibid.
- ¹³Ibid., p. 146.
- ¹⁴Ibid.
- ¹⁵Ibid., p. 147.
- ¹⁶Singer, p. 185
- ¹⁷Jerusalem, III, 185.
- ¹⁸Ibid., p. 232.
- ¹⁹Ibid., p. 170.
- ²⁰Ashton, p. 69.
- ²¹The Marriage of Heaven and Hell, II, 182.
- ²²Milton, Poetry and Prose, p. 516.
- ²³Jerusalem, III, 182.

²⁴Ibid., p. 181.

²⁵Vala, II, 95.

²⁶Ibid.

²⁷Jerusalem, III, 222.

²⁸Ibid., p. 185.

²⁹Ibid., p. 256.

³⁰Ibid.

³¹Blake is right. The steam-driven mills did not replace the water-driven flour mills.

³²Jerusalem, III, 231.

³³Ibid., pp. 169.

³⁴Ibid., p. 185.

³⁵Ibid., p. 182.

³⁶Ibid.

NOTES TO CHAPTER V

- ¹The Book of Urizen, I, 315.
- ²Singer, p. 279.
- ³Ibid.
- ⁴Vala, II, 3.
- ⁵Jerusalem, III, 183.
- ⁶See Chapter III, p. 18.
- ⁷Jerusalem, III, 170.
- ⁸Ibid., p. 254.
- ⁹"Cotton Spinning and Manufacture," Encyclopaedia Britannica, 1955, VI, 551.
- ¹⁰Vala, II, 26.
- ¹¹Singer, p. 292.
- ¹²"Cotton Spinning and Manufacture," p. 553.
- ¹³Vala, Poetry and Prose, p. 297.
- ¹⁴Jerusalem, III, 212.

NOTES TO CHAPTER VI

- 1 "The Tyger," Songs of Experience, Poetry and Prose, p. 72.
- 2 "The Tyger," Poems from the Rossetti Manuscript, I, 233.
- 3 Ibid., p. 232.
- 4 Ibid.
- 5 Ibid.
- 6 Ibid.
- 7 For a discussion of Blake's use of bymbols in "The Tyger," see Stanley Gardner, Infinity on the Anvil (Oxford, 1954), pp. 123-130.
- 8 Vala, Poetry and Prose, p. 318.
- 9 America, I, 264.
- 10 Singer, pp. 99-116.
- 11 See Vala, II, 24-25, for Blake's description of the formation of coal.
- 12 Ibid., p. 25.
- 13 Erdman, p. 308 n.
- 14 Ibid., p. 308.
- 15 Singer, p. 102.
- 16 Jerusalem, III, 172.
- 17 The Book of Ahania, I, 323.
- 18 Vala, II, 16.
- 19 Ibid., p. 24.
- 20 Fleming, p. 185.
- 21 C. R. Fay, Great Britain from Adam Smith to the Present Day (New York, 1928), p. 270.

²²Fleming, p. 185.

²³Jerusalem, III, 178-179.

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