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John W. Wright

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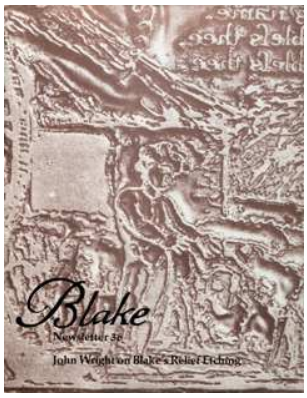


NOTES

Blake's Relief-Etching Method

BY JOHN W. WRIGHT

(above) "The School Boy": An over-inked print from John Wright's fascimile plate (see *Blake Newsletter* 26) showing shadow line effects where platform edges picked up ink from the roller used and transferred them to the paper during printing which was done by rubbing the reverse side of the paper with a wooden spoon. Much fainter traces of this kind can be found in many copies of the Illuminated Books.

Introduction

The unique medium of Blake's Illuminated Books involves aesthetically crucial relationships not only between words and pictures, as is now being more generally appreciated, but also between these "forms" of design and other still unfamiliar characteristics which are embedded in effects of the *means* by which these works were produced. We cannot really appreciate the qualities of Blake's pages without knowing more than we do now about the technical means of their production, because technique generates qualities and sets limits to what is attempted as design and is the source of basic variables in the virtually alchemical matrix of his production process. Individual elements and qualities of Blake's work are decided features of concrete designs and should be seen as forms made particularly and as specific to his medium. They can and ought also to be distinguished from one another as forms potential in his varied treatments of the pages, lest we continue to discuss them as if they were only instances of "art" or "vision" in general (including Blake's general theory of art, which is a critical fiction) or of "pictorial and verbal" compositions or of "graphic and poetic genres."

Part of the uniqueness of Blake's medium is the potential variety of relationships between the prints and pages, and the technical and physical base of their production, the plates. My main purposes here are to describe these plates as artifacts (and the difficulties of "reading" them to recover the method of their production), to explain their character and their significance as part of Blake's special medium, and to interpret their possible contribution to the development of his vision. Specifically, this essay describes and analyzes some of the signs of etching techniques which appear in the Gilchrist electrotypes and in the only surviving Blake plate, the fragment of a rejected version of *America* a, now in the Rosenwald collection.

Current Opinion and the New Hypothesis

Geoffrey Keynes and others have written of Blake's relief-etched plates as if the electrotypes and the *America* a fragment were the same sort of artifact; and, in fact, no account of their relationship or the differences between them has appeared. As illustrations 1 and 6 readily show, they both do have the look of relief-etched plates, but they have very different aspects too; not only because the *America* design is less dense and a fragment, but also because there the plate area surrounding the design and the general contours of the background copper are much less worked and are more evenly flat. Even simple comparison like this would suggest that Blake has worked in two different ways on these plates. Perhaps that alone accounts for the fact that their differences have not been remarked as particularly significant. But the current, generally circulated opinion about Blake's process implies that these plates have a much simpler appearance and actual structure than they do.

Of the electrotypes Keynes has written, "The interest of these blocks is very great because, being electrotypes, they are exact reproductions of Blake's plates so that something can be learnt from them of his technique" (*Blake Studies*, 2nd ed., p. 124). Then, however, he goes on to say of the etching process only that

> The plate was then etched with acid to no very great depth, but deeply enough to allow the text to stand out in relief. Blake then gouged out some of the larger spaces more deeply to prevent unwanted ink from showing in the print, and finally added more or less detail to the designs by means of the graver (124).

But *America* a, which is certainly a Blake plate, shows no gouging (which would be a terrible waste of time across such a large background that could have been much more quickly etched away), and the electrotypes themselves actually show very little systematic gouging in the more open areas (see, for example, the inside of the hoop in *The Echoing Green* [illustration 3]); and many of these marks are attributable to the electrotypists. Nor is such gouging evident in the areas of the plates which, as the prints from them show, were most in need of that treatment. *The Divine Image* illustrates this very well. The surface characters of each design sit on platforms of fairly ragged and not gouged copper; these in turn rise above the relatively smooth background copper of the basin of the plate. There is considerable variation among the electrotypes in these characteristics, but the primary structure is distinctly uniform and much different from that suggested by Keynes' description of a shallow etching process supplemented by gouging. Actually, the electrotypes show clearly the effects of a process of etching away the unwanted copper by stages in the manner I described in *Blake Newsletter* 26.

Because I could not get good results by etching the facsimile *Songs* and other trial plates in single bites for various lengths of time in acids of different strengths, I went back to the Victoria and Albert Museum with a stronger magnifying glass to have a closer look at the electrotypes and discovered the process Blake invented for surmounting those difficulties in making his plates.

After a relatively brief initial bite to lower the copper surface around the design which had been laid down in acid resistant varnish, he removed the plates from the acid bath. He then minutely repainted the unbitten surface with maxi-

John Wright, University of Michigan, is the author of *Shelley's Myth of Metaphor* (1970) and *Poems and Woodcuts* (1976). He thanks Virginia Masi for exceptionally fine editorial assistance on the present essay, and he is grateful for financial support in the research from ACLS, NEH, and the Horace H. Rackham Foundation.

mum fidelity to the contours of the design to protect each character during further biting. This process was (usually) repeated twice more; first to produce the more readily visible and ragged platforms around the base of the characters, and finally to produce the basin areas most deeply recessed from the plate surface.

Evidence of these protective recoverings of the design during the etching process is consistently but not uniformly evident in the sixteen electrotypes. The first of these three recoverings is so faithful to the surface of the design it covers that it is always very hard to see, even on the enlargements used here for illustration. Part of the reason for this difficulty is simple. Where the repainting exactly recovers the surface of the first, shallowly-etched design (which it then better protects from foul-biting: one of the primary reasons for the second application of the varnish), it does not extend into the lowered area immediately adjacent to the surface. In such areas subsequent etching simply continues lowering the sidewall of the character. In many areas, and usually on only one side of a character, however, there is a slight overlap, which is evidence of Blake's method.

Before the structural characteristics of the electrotypes are considered more fully, however, it is important to attend to some of the procedural and methodological problems which bear on the present analysis (and will bear on future explorations in this area), and also to raise again the matter of the different appearance of the *America* fragment.

(1) Because there are no standards to describe the physical characteristics of the sort of artifact these plates represent, some special terminology will be needed. It will even then not be easy to see what physical conditions are being referred to. Lengthy and minute examination of the plates is the best remedy for this difficulty, but that is itself bewildering if one does not know what sort of map to apply to the terrain. Even when one knows what to look for--because one has seen it repeatedly before and thought about what the signs mean--one can still be overwhelmed by the countless small differences that fly into view as one moves the glass from area to area or plate to plate. Hence, the aim of this hypothesis about Blake's method is to serve as a map for the terrain of those sculptures and hopefully to be useful in ordering observation.

(2) A second difficulty is related to this first one. The descriptions above and the diagrams that follow refer to "structural" features of the plates--that is, to their manner of construction. The plates are illustrated here by photographic enlargements which simplify these features of the terrain from three dimensions to two and from varied available light to black and white reproduction. This alters one's sense of the designs and their functional elements, and the scale of the plates themselves. But "reading" these aerial photographs of that terrain affords very useful practice nonetheless in deciphering the causes of and the kinds of physical traces on the plates and on Blake's pages. Where appropriate hereafter, I will try to indicate how the characteristics of the photographs translate to the appearances of the plate surfaces.

(3) The third difficulty relates to the observational problems posed by (1) and (2). During close study of the surviving relief-etched plates, one sees that they are timeworn and now have characteristics which they did not have when they were first made and used: oxidation, cleaning, scratching and corrections in the case of the electrotypes, and these and hammering too in the case of *America* a, have in some places so altered the metal as to make it practically impossible to tell without complex metallurgical and graphic analysis whether Blake's or a later process has been the cause of the various characteristics.

This general textural problem is logically independent of the structural characteristics I will be considering, but practically it does bear on them in the case of the electrotypes. "Reading" the electrotypes means interpreting relationships between texture and structure in always individually handled plates. Up to a point, the more one becomes able to notice, the greater is one's uncertainty about the types of effects observed in the textural field of the plate. At first sight nearly everything is "textural," and it is all too easy to impose a simple explanation for the causes of texture and to distort the complexity of the actual characteristics of these artifacts.

Not only are the plates timeworn in various ways (which causes uncertainty about the significance of many particular signs); two of the electrotypes differ significantly in surface design from the printed and painted pages of the copies of the *Songs* I have seen, and the electrotypes generally have a textural appearance markedly different from the *America* fragment. These last two facts raise the question of whether the electrotypes were actually made from Blake's plates: from fourteen he regularly used and one or two others he did not, or whether they might not have been made from another set of plates.

One of the electrotypes, the title plate to *Songs of Experience*, differs in its characters, as Keynes noted, from the plate Blake always used for that page in the *Songs*. Erdman, finding signs of "forger's tremble" in this design, has disputed Keynes' assumption that it represents an extra, rejected plate which somehow turned up among the survivors given for electrotyping. He concludes that it comes "from a redrawing of the page made for Gilchrist's need" (*The Illuminated Blake*, p. 72). For two reasons this conclusion is not acceptable. The variant plate omits certain characters that the copyist could not easily have overlooked (including the date, 1794), adds others not in Blake's pages, and shows quite "perfect" handling elsewhere. More important still, it was etched in the same manner as the other plates, though more deeply. Its more open design required that for printing. That being true we

would have to suppose with the Erdman view that the plate from which this electrotype was taken was itself made exactly in Blake's minutely careful manner and indeed more carefully than the "trembling" design itself--a conclusion not likely given the requirements of the whole task.

The etching signatures being the same for all the plates, another possibility arises: that the whole series was produced from a set of plates other than Blake's. I have wrestled often with the idea of another means of production for the electrotypes and have concluded that it is not feasible, even though the evident differences between their textural and structural characteristics and those of *America* a might seem to support that possibility.

The only process that could have been used to produce plates with such accurate surfaces and the same genuine sort of step-bitten structure shown in the electrotypes is photoengraving, a process invented but not widely used between 1859 and 1862 (see the *Encyclopedia Britannica*, "Photoengraving"). But irregularities and variable characteristics of the substructure of the electrotype plates mark them as handmade; photoengraving produces more mechanical and uniform etching effects. Thus, I reject the idea of other plates and will not examine the subject further here, except to say that the very structural characteristics which show Blake's own work most fully on the electrotypes do draw attention to the different textural qualities of the *America* fragment. The hypothesis being developed here will explain these relations.

Relief-Etching Signatures in the Electrotypes

From their experiments in 1947, reported in *Print Collectors Quarterly*, 29 (Nov., 1948), pp. 25-37, Ruthven Todd, S. William Hayter and Joan Miro concluded that Blake probably used a transfer method to get the text of his design from a sheet of paper where they were first painted in varnish onto the copper plates for etching, and that, judging from the extreme shallowness of the relief on the *America* fragment, he could not have used a roller to ink the plates but must have transferred ink from another plate to the surface of the one to be printed. In support of these ideas they observed that Blake's prints and pages frequently show a distinctive reticulation in the printed areas which they regarded as characteristic of plate rather than roller inking. They also noted that certain pages show tilting and/or curvature in the lines of text which might result from their being hand placed and pressed onto the copper by the transfer process. I have found, however, that some pages vary considerably from this rule. For example, the plate containing *My Pretty Rose Tree*, *Ah, Sun Flower*, and *The Lilly* seems to show a slightly different direction of curvature for each text, and it would not be reasonable to suppose that Blake applied the texts to the copper successively to produce that effect. In other plates, too, the curvature of the text often may be an expressive part of the design, making distinct its spatial form and screen-like qualities.

On the question of roller versus plate inking, Todd and Hayter did not explain how Blake could have prepared the inking plate smoothly enough to give even coverage and to prevent small masses of ink from spreading out under pressure into subsurface areas, particularly into broad open areas and the special high platforms, which are even closer to the printing surface, as the *America* fragment clearly shows. Still more important perhaps, their hypothesis neglects to consider the facts that the proof Blake took of *America* a shows a distinct roller-inking trace and that many of his pages and proofs do not show significant reticulation of inking texture but rather a smoother surface more consistent with the effect of roller-inked plates. These and other considerations make it likely that Blake worked in all these ways and very experimentally. The relatively greater relief of the electrotypes supports that possibility and suggests that the *America* fragment was probably not given the usual one or two final etching stages.

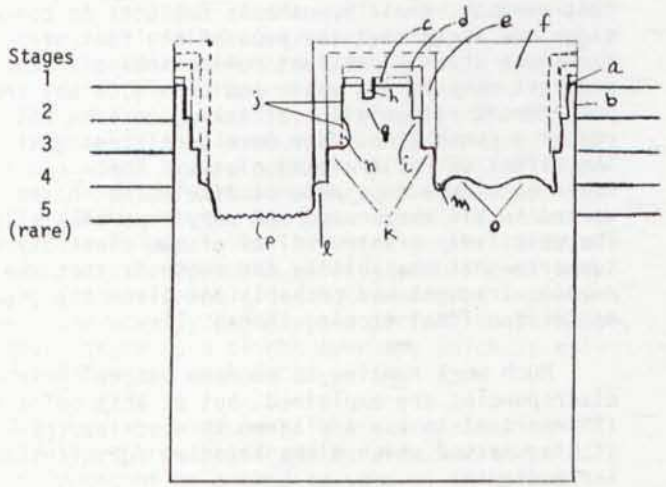
Much work remains to be done before these discrepancies are explained, but at this point it is important to use a diagram to describe the etching method which Blake invented for his singular medium.

The traces or signatures of the first repainting are necessarily very slight marks and very hard to detect because they often cover exactly the surface characters of the design (as shown here at *i* in diagram I). This technique both adds a further protective coating to the characters before foul-biting has time to do much damage to the lines, and as far as possible avoids getting the varnish used in the repainting out so far beyond the edge of the very shallow first bite as to start a platform that will pick up ink. Two rules about this practice should be kept in mind: (1) the larger the open area around a character, the greater the likelihood that it will draw ink during the painting; and therefore the deeper its eventual relief will have to be. (Plate inking reduces this problem, but Blake's pages frequently show platform traces and background dots which indicate the roller effects.) (2) A first repainting must be general, not local; the more so if it is done very early, as Blake did. The invisibility of traces of repainting does not, normally, mean that it was only local, but only that traces or the ledges left by it are evident only where the brush went over the side of the character by accident or by design.

Diagram II (*a*) represents this ledging problem as a platform extending from the vertical axis of a character. Blake often and with marvelous control painted very slightly over the edge of the original character, and from these traces we know that the first repainting occurred over the whole surface of the design.

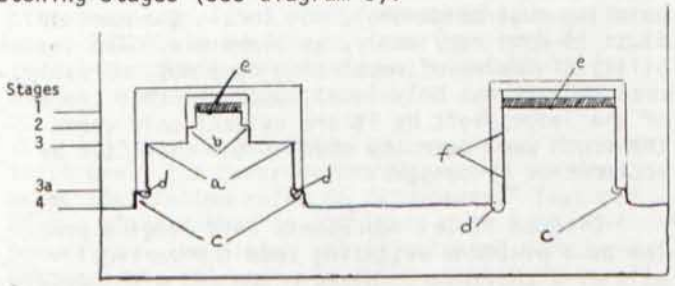
On the plates these traces are virtually invisible to the naked eye--unlike those of the

Diagram I (below): Schematic representation in cross-section of plate etched by Blake's method: showing different kinds of effects of that process as ennumerated to the right.



a. plate surface
b. plate side
c. original varnish on character in design
d. varnish area of first repainting
e. varnish area of second repainting
f. varnish area of third repainting
g. character platform from first etch
h. foul-bite area in character
i. ledge from varnish overlap of first repainting
j. unledged platform from open bite through stages 2 and 3
k. ledges from varnish overlap of second repainting
l. ledge from varnish overlap of third repainting
m. groove from strong etch at join of basin and sidewall
n. underbitten area from prolonged etch (see j.)
o. ring mound, basin area
p. striated basin area from strong final etch

Diagram II (below): Schematic representation in cross-section of two characters as etched in the *America* a fragment: showing particularly and roughly in proportion the difference between the large problematic ledges of the mended characters (on the left) and the straight sidewalls of the characters more exactly overpainted during the etching stages (see diagram I).



a. set I traces
b. set II traces
c. set III traces
d. strong etch grooves
e. surface character
f. flat sidewall of character perfectly overpainted through stage 4

second repainting (the third stage of the process), which are visible. They can, however, be seen with a strong glass (and will be found, thin as they are, still to vary in thickness from plate to plate). They can, with a little practice, be discerned as a pattern in the enlargements at the locations listed below. In looking for or at these fine traces, two things should be noted: (1) details become less sharp the further they are from the center of the camera's focus. (2) It is helpful to look for grades of shadow between the surface lights and the basin lights; among these tones the platform made by the first repainting is recorded as a faint shadow between the illuminated side walls above and below it.

The Lamb (illus. 1 and 5): see the bottom edge of (1) the title words, (2) the upper right-most inward curving branch of the tree at the left, and (3) the long horizontal line just below the boy and sheep.

The Divine Image (illus. 2): see the bottom edge of (1) the top margin line (especially the center of its right half), which shows well that the traces are discontinuous; (2) the curved area dividing the stanzas, which represents well how evenly Blake could follow the edge of the character while overpainting it very slightly; and (3) the similar line above "The Divine" in the title. Area (3) and the line below "Divine" are good places to look for the whole range of main steps.

The Echoing Green (illus. 3): see the bottom edge of the baseline of the upper half of the plate, especially above *G* and slightly to its right, and also the vine line below "Green." Below the lines forming the shoulders of the woman nearest the center of the tree, the first traces of repainting are particularly clear, as are those of the second (to be considered in a moment).

A Cradle Song (illus. 4): see the inside edge of the two right-most curves opposite the space dividing stanzas two and three. These lines indicate particularly well the problem posed by the photographic lighting conditions and the extreme thinness of the first repainting traces. Generally the first repainting of the plate was done with exceptional fidelity to character surface. (Note that the *d* of "dreams" in line three is missing on the plate and in the electrotype prints. It appears in Blake's pages, and, when examined under a strong magnifying glass in several copies, it proves to be the same shape and the same quality of pigment as the rest of the print. It was, therefore, not added to the prints as a character lost through foul-biting or undercutting would have been; probably it was lost accidentally in the moulding phase of the electrotyping process.)

One effect of the first repainting with varnish over the edge of the surface platform is usually a very slight flow of varnish down the side of the character and out into the basin, which at that point in the process is very shallow. This spreading of the varnish means that during

1 (on page 100) "The Lamb," I: The plate has been photographically reversed to facilitate reading it. References in the text are to the plate as printed here.) For this print and for the three prints following the photographic exposure was made with the bottom of the plate tilted up slightly from a horizontal position to bring out the terraced effect of the platforms produced by Blake's relief-etching method.

2 (on page 101) "The Divine Image": (Plate photographically reversed.) Platforms are particularly evident along some of the horizontal lines bounding some of the more open basin areas.

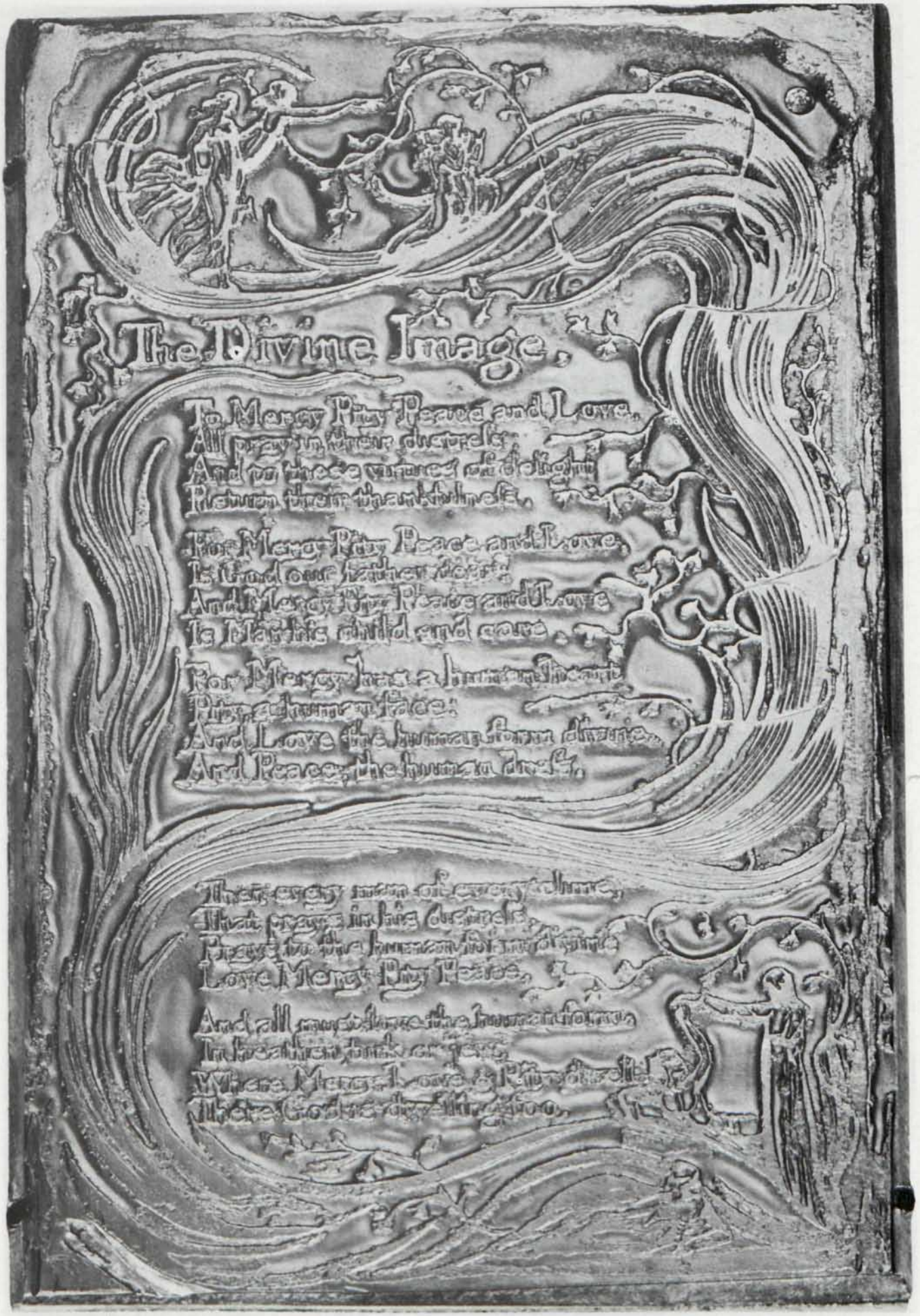
3 (on page 102) "The Ecchoing Green": (Plate photographically reversed.) The centric focus of the camera has made the area of the lower half of the plate more distinct and the etching signatures can be discerned best in the upper and middle portions of that area.

4 (on page 103) "A Cradle Song": (Plate photographically reversed.) Reading the features of this photograph is easier when it is remembered that the plate has been tilted slightly up from its bottom and that the light source comes down approximately from the "A" corner. The potential for optical reversal of figure-ground relations on a revarnished plate during the later stages of repainting and re-etching is particularly evident in this one. See also diagram III for the stages leading to the emergence of such hieroglyphs from between the lines of the positive design.

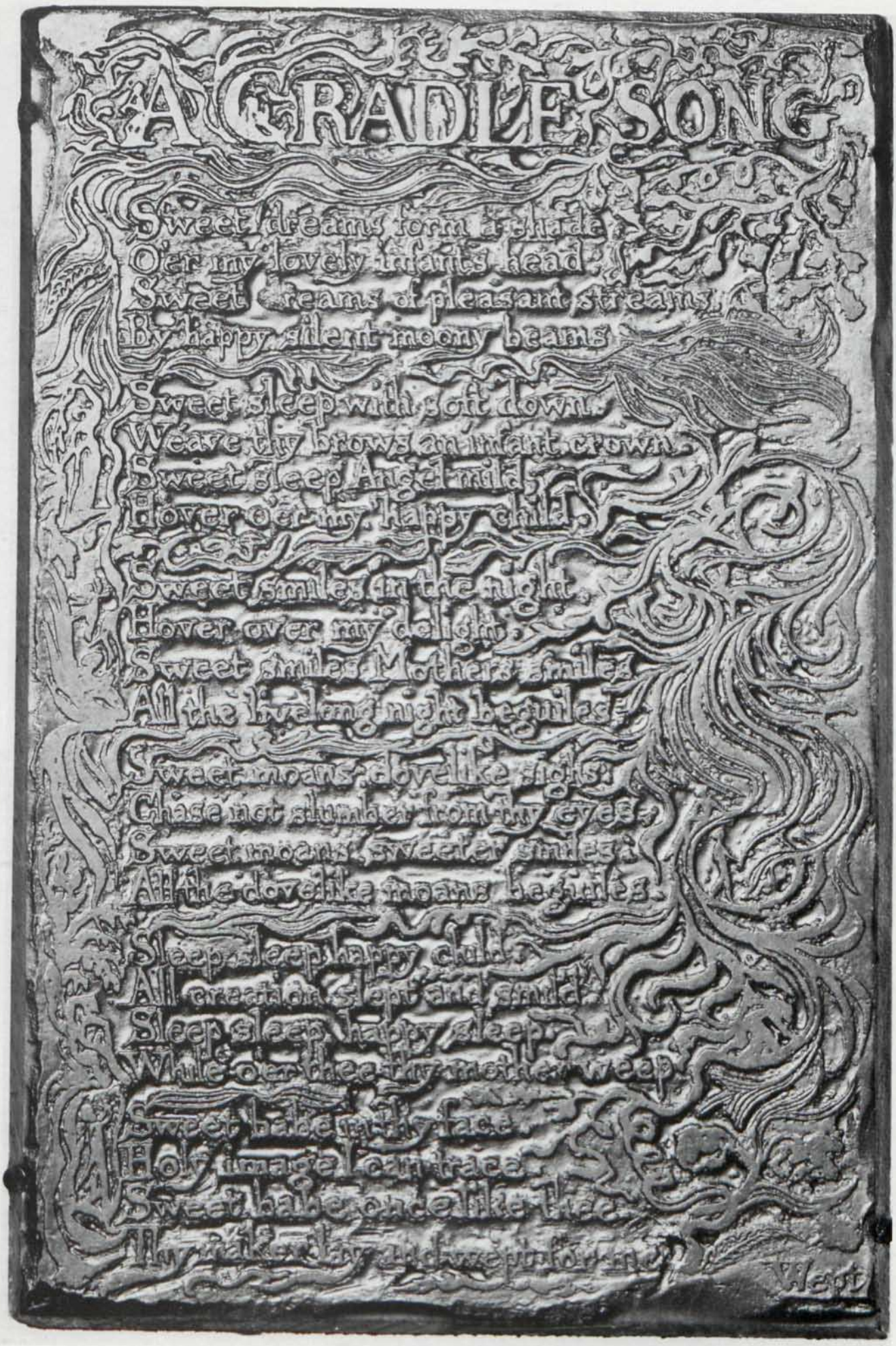
5 (on page 104) "The Lamb," II: (Plate photographically reversed.) Same plate as "The Lamb," I, photographed with camera angle centered on horizontally positioned plate.

6 (on page 105) *America* a fragment: (Plate photographically reversed.) Enlargement of whole fragment showing different condition of this incompletely etched plate as compared with the electrotypes. See also illus. 7 and 9.

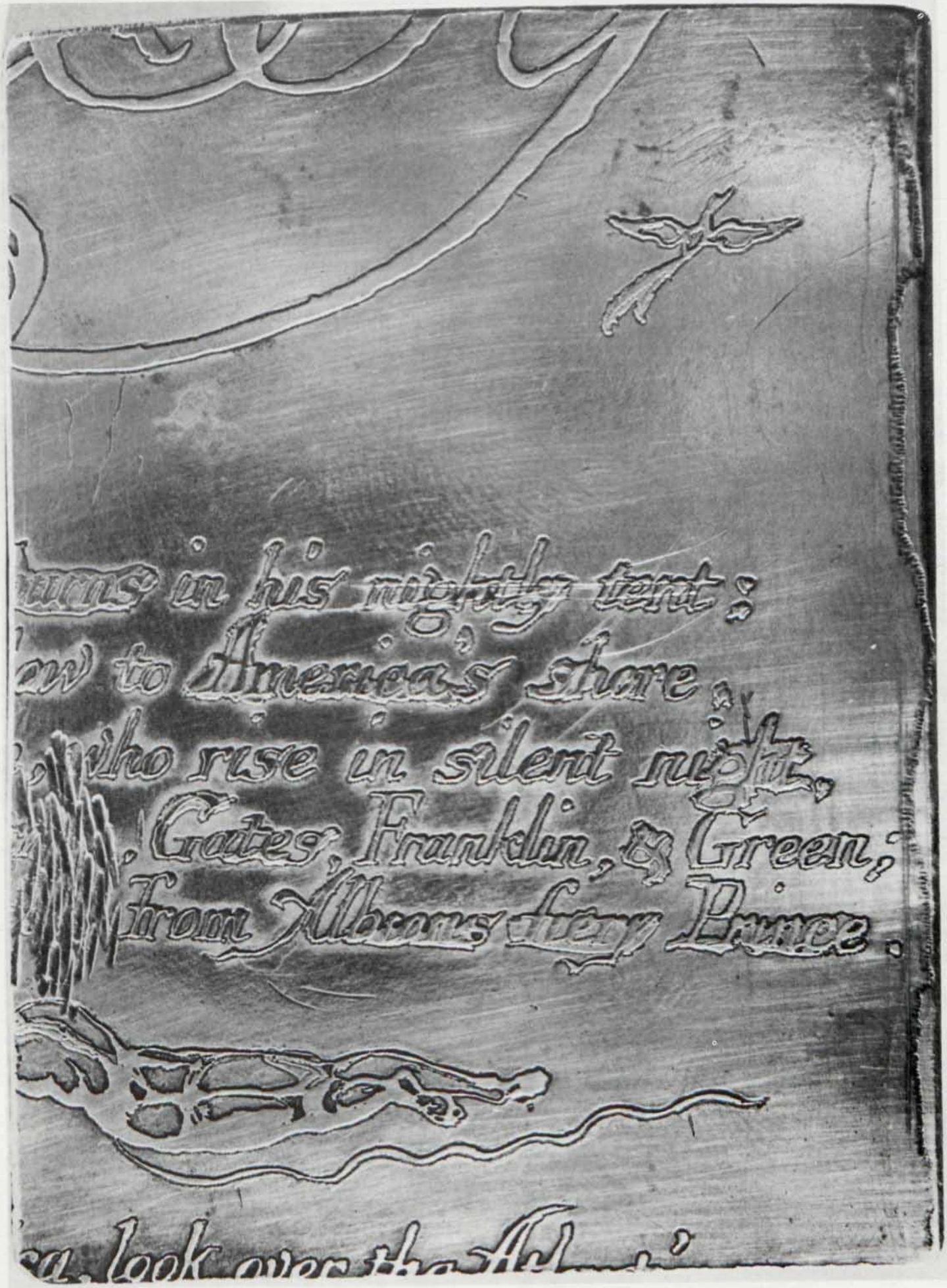

The Lamb
Little Lamb who made thee
Dost thou know who made thee
Gave thee life & bid thee feed.
By the stream & o'er the mead;
Gave thee clothing of delight,
Softest clothing woolly bright;
Gave thee such a tender voice,
Making all the vales rejoice;
Little Lamb who made thee
Dost thou know who made thee
Little Lamb I'll tell thee,
Little Lamb I'll tell thee;
He is called by thy name,
For he calls himself a Lamb;
He is meek & he is mild,
He became a little child.
I a child & thou a lamb,
We are called by his name.
Little Lamb God bless thee.
Little Lamb God bless thee.


The Divine Image.
To Mercy Pity Peace and Love,
All pray in their distress;
And to these virtues of delight
Return their thankfulness.
For Mercy Pity Peace and Love,
Is God our father dear:
And Mercy Pity Peace and Love
Is Man his child and care.
For Mercy has a human heart
Pity a human face:
And Love the human form divine,
And Peace the human dress.
Love Mercy Pity Peace.


The Ecchoing Green
The Sun does arise
And make happy the skies
The merry bells ring
To welcome the Spring
The sky lark and the thrush
The birds of the bush
Sing louder around
To the bells cheerful sound
While our sports shall be seen
On the Ecchoing Green.


A CRADLE SONG
Sweet dreams form a shade
O'er my lovely infants head
Sweet dreams of pleasant streams
By happy silent moony beams
Sweet sleep with soft down
Weave thy brows an infant crown
Sweet sleep Angel mild
Hover o'er my happy child
Sweet smiles in the night
Hover over my delight
Sweet smiles Mothers smiles
All the livelong night beguiles
Sweet moans dovelike sighs
Chase not slumber from thy eyes
Sweet moans sweeter smiles
All the dovelike moans beguiles
Sleep sleep happy child
All creation slept and smiled
Sleep sleep happy sleep
While o'er thee thy mother weep
Sweet babe in thy face
Holy image I can trace
Sweet babe once like thee
Thy maker lay and wept for me
Wept


The Lamb
Little Lamb who made thee
Dost thou know who made thee
Gave thee life & bid thee feed.
By the stream & o'er the mead;
Gave thee clothing of delight,
Softest clothing woolly bright;
Gave thee such a tender voice,
Making all the vales rejoice;
Little Lamb who made thee
Dost thou know who made thee
Little Lamb I'll tell thee,
Little Lamb I'll tell thee:
He is called by thy name,
For he calls himself a Lamb:
He is meek & he is mild,
He became a little child:
I a child & thou a lamb,
We are called by his name.
Little Lamb God bless thee.
Little Lamb God bless thee.


in his mighty tent;
to America's shore,
who rise in silent night,
Gates, Franklin, & Green,
from Albion's fiery Prince.

the second bite the acid will lower the copper from the wavy line of the second coat of varnish, not from the original smooth edges of the character. The signature of this second stage of etching is clearly evident as the outer edge and wall below all the traces already noted.

But, of course, to re-emphasize the key point about structure, wherever the first repainting has covered only the surface of the character, the second biting is virtually invisible (necessarily so on the photographs). It can be detected only as a slightly greater underbiting of the character (which is often impossible to see in the photographs; *n* and *j* on diagram I), with beaded traces of copper sometimes jutting out from the face of the platform cliff. See, for example, the inside edges of the *o* of "Song" in the title of *A Cradle Song*. Generally, Blake's second bite was also fairly shallow, not twice the depth of the first.

After the second bite (stage 3), all the denser passages of the design have enough relief for printing. At that point Blake could simplify the repainting process by selectively painting over whole groups of characters *as local conditions permitted* for protection during the later stages of biting. Diagram III represents these effects, and they can be seen in the photographs around the first "little" of the second stanza of *The Lamb*, "pity" and Peace" in the first line of *The Divine Image* and "divine" in line 11. (These effects should be compared with the similar but, as I shall indicate later, probably functionally different platforms evident in the *America* fragment: there see especially "[b]urns.") See also "Among the old folk" in the last line of *The Echoing Green* and the area around "Song" in the title and "Hover" in line 8 of *A Cradle Song*.

After the second repainting has preserved the (usually) double relief of the primary characters, more selective and varied ways of repainting are possible. Because of this, the texture and structure of the electrotypes vary greatly within the plates and from one plate to another at the level designated stage 4 in the diagram. Part of this variety was caused by numerous places where Blake's brush did not extend the varnish signifi-

Diagram III (below): "The Lamb" A and B: Replicas of a revarnished design showing on A and B respectively typical effects of the repainting process at stages III and IV of the etching process (see diagram I).

cantly over the edge of the platform established by the second bite; so the second bite traces were only inconsistently preserved by the third repainting. Examples of the relatively flat-wall effect of this narrower repainting (which is always apt to become more pronounced because of the sideways action of the acid) can be seen clearly at the lower edge of "pleasant" in line 3 of *A Cradle Song* (contrast this with "smiles" in line 9) and the outer edge of the curve of the main branch of the flame next to line 8 of *The Divine Image* (contrast this with the traces of the second repainting immediately above the opposite lines 5 and 6).

The Echoing Green illustrates well the technique of generally repainting groups of characters after the second bite. The two areas of text stand on a general plateau (later routed and perhaps etched further) above the primary basin evident at the left of the first stanza by the boy and beside the wavy line dividing the stanzas. The extra etching and gouging around this line and the etched (not, as it may appear, gouged) area below the last stanza, show the method of lowering the basin by continuing the third and/or initiating a fourth bite in the open areas most likely to receive ink from a plate or roller.

In contrast to the general plateau of *The Echoing Green*, *The Divine Image* shows how Blake applied the second repainting locally, along lines of text to word groups as well as singly to characters and then, as a final stage, deepened the basin around them. The three-stage etching process is particularly fine and distinct throughout this plate. In the enlargement, "divine" in line 11 shows clearly the second ledges of repainting. As illustrations of Blake's process, they are important because they extend so far beyond the characters at some points that they would have printed had they been made at the time and depth characteristic of the first repainting (again compare "[b]urns" in *America*).

This plate shows another characteristic effect of Blake's process: a dark dot below the *c* of "Peace" in line 12 is all the information the photograph can provide about a marked undercutting or erosion of the sidewall of that area during the third bite. Caves such as this (which appear elsewhere at that level in this plate and others) are particularly important because they indicate that the third bite was a prolonged one, a fact which helps to account for the unusually rounded or beaded quality of many of the traces of the third repainting. There is also much evidence of foul-biting on the surface characters; the upper curves of the flame below the last line in the lower left hand corner of the plate show it clearly, and the broken pattern appears in the electrotype prints and in some of Blake's pages.

The undulating contours of the basin's surface (confused by the lights of the photograph) are read more easily if one focuses on two similar areas which have slightly different light qualities; say on the space immediately to the right and the one immediately below the striding, pointing figure just to the right of the second stanza. The center area of the one to the right is, contrary to appearance, raised slightly at the center within the ring mound; the one below is a smoother contour across the central area within the ring mound whose edge is marked by the area of dark. That darker region itself, incidentally, is the shadow of a slightly deeper area (caused by the greater force of the acid in the space around the platforms where more copper is exposed during the biting).

I'm not sure what produced these undulations; they appear more locally in a number of the electrotype plates and in a slightly less pronounced form at the right, margin area of the *America* a fragment. I think they resulted from a relatively long and somewhat weaker final etch than Blake used in basin areas like those of *A Cradle Song*, where a strong fourth etch has cleaned out certain areas. But as the London electrotype in the Victoria and Albert Museum has these undulations in a somewhat less pronounced form than the copy in the Fitzwilliam Museum, it may be that they are exaggerated by the moulding process used in making the electrotypes.

It is, incidentally, a great loss that Messrs. Clay and Sons destroyed the original electrotypes from which these sets and the other one now owned by Trianon Press were made, because numerous small differences between the two sets I have looked at cannot easily be traced to Blake's work or that of the first or second electrotypist without comparison with the original electrotypes.

Of the plates illustrated here, *A Cradle Song* shows most clearly the technique of strong local biting of the basin areas. The texture of these deepest areas and their location in many places where there would, for printing, be no need of gouging--because the surrounding characters provide more than adequate support for the inked printing surfaces, as above the second "sleep" of "Sleep sleep happy child"--would seem to indicate that these areas are mainly etching (rather than gouging) effects. Moreover, many of these areas show a relatively deep undercutting of the platform walls not characteristic of the routing process. In this case Blake repainted all the characters once to establish the top platform in the usual way, bit it a second time quite shallowly, and then generally repainted certain areas, like the lower right hand corner (see the edges of the wheat or leaf). He then repainted the other characters individually or in groups for a third etching (but the details of this are hard to determine from the photograph and my notes on the plate are not sufficiently clear about it). After the third etching he repainted nearly all the characters, grouping them in various ways under the varnish and, as just noted, bit much more strongly the deepest areas which generally appear as the brightest (nearest) lights in the photograph.

The observations made thus far on the technique Blake used in making the plates for his *Songs* provide sufficient evidence to establish the fact and the character of the repainting and stepped-biting process. I hope they will prove useful as a guide for "reading" the photographs and the plates themselves, from which there is still much to learn.

Relief-Etching Signatures in the America *Fragment*

The enlargements (illustrations 6 and 7) indicate how the *America* fragment appears to differ significantly as a relief-etching from the electrotypes of the *Songs*. They are somewhat more deeply bitten and generally worked over as plates and show, as we have seen, use of the stepped-biting method throughout. The less deeply bitten fragment has been etched in stages in a few areas, those of the bird, the flying figure, "[b]urns," "Albion's," "fiery," "Prince" and the like; but the rest of the plate (even in the enlargement), probably at first sight appears to have been bitten in a single step. But this general appearance is misleading: knowing what to look for in the substructure of a relief-etched plate (using a strong glass if one is looking at the actual plate), one can find in addition to the immediately obvious platforms, other sorts of traces of repainting. From these different traces it is possible to reconstruct in part the etching process Blake used on this plate and to show its consistency with the method recorded in the electrotypes. Because the physical particulars are difficult to discern and because their kind and degree are essential to an interpretation, I shall first present detailed evidence of the three classes of characteristics and then discuss their significance. To clarify this procedure I shall use the term "set" now for each group of physical traces sharing similarities of location and treatment and, as before, the terms "character" and "characteristic" for any component of the surface design, distinguishing where necessary between figure, letter and word.

The first of the sets of physical traces of the etching process includes the immediately evident and comparatively spread-out platforms already noted. They appear within and around "[b]urns," "nightly," "[gl]ow," "America's," "shore," "nightly," "Gates," "&," "Albion's," "fiery," "Prince," the bird and the interior portions of the flying figure near the bottom. These platforms are the effect of repainting areas already etched to the depth greater than that allowed for the first bite in the electrotypes and about half or a bit more of the total depth of the bite of the plate (see diagram II).

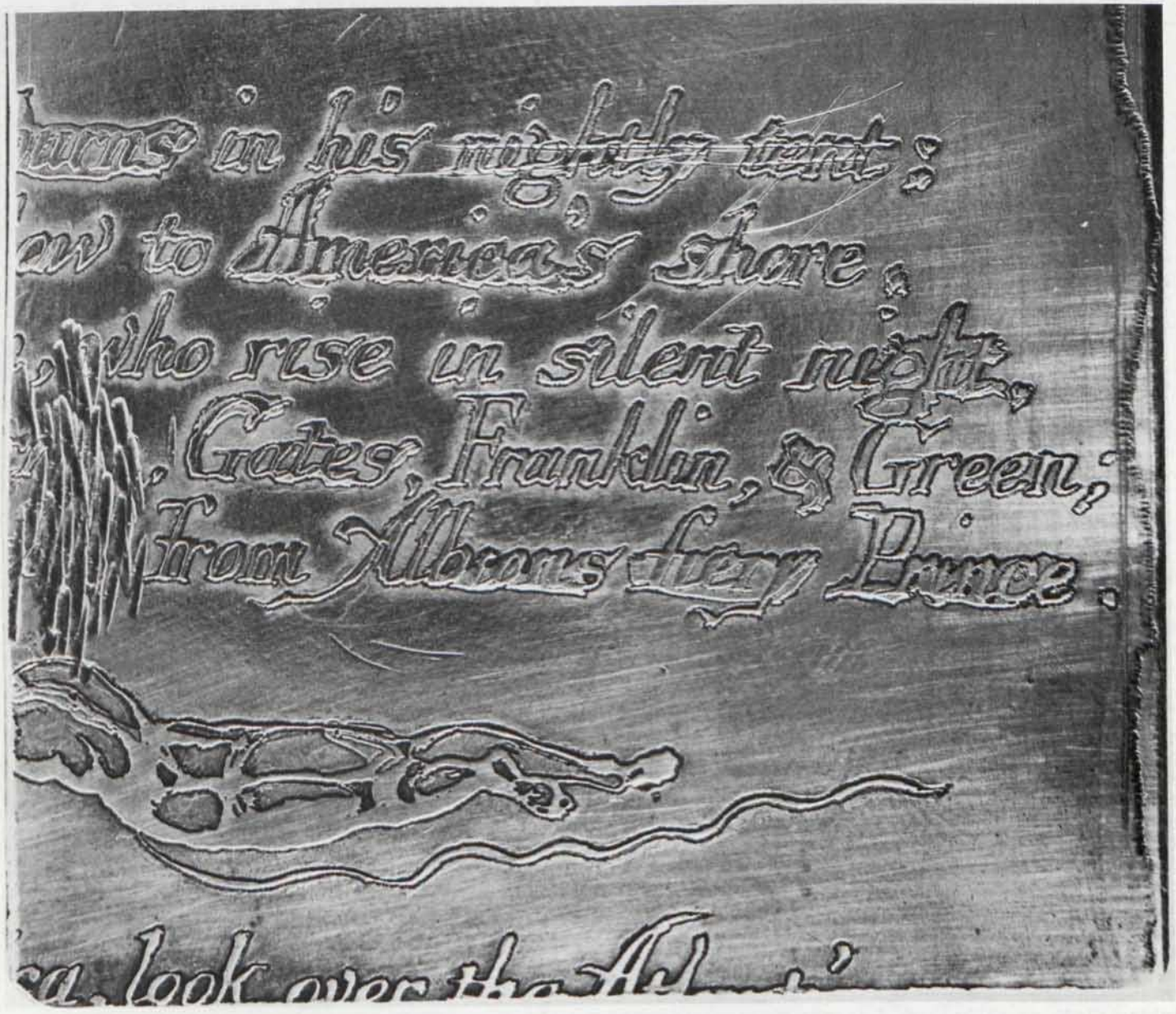
Another striking difference between these platform areas in the *America* plate and the electrotypes is easily seen in the enlargements. The characters around or within these platforms were not repainted singly as Blake had done earlier to optimize relief for the printing process, but in clusters. The nearness of these platforms to the surface risks drawing ink down into the space immediately around the characters. Some of them, those around "[b]urns," the *G* of "Gates" and the ampersand, for example, would produce the shadow line effect noted earlier (see *a* in diagram II). When Blake could do such fine repainting as we have seen already, why did he here work so much more crudely? Ink does indeed spread around these character groups easily and all Blake's earlier plates would have provided a more than sufficient awareness of that problem. Most likely these areas involve a special local mending process and reflect a mistake of judgment rather than a purposeful exercise of his usual method and skill. The mistake probably has two main elements. First, the fact that the other characters were not given this heavy repainting points to the possibility that something went wrong in certain areas during the etching process, requiring special local treatment--some of the varnish began to break down for some reason, for example. In correcting this local breakdown, Blake made an error in repainting the trouble spots, the second element of the mistake. Where he should have repainted each character singly, he misjudged the depth of relief established and repainted characters in groups as though they were ready for a third etching.

One problem apt to occur during relief-etching clarifies further the physical and technical basis of this situation. Areas along the edges and vertical sides of the characters which are missed or are too thinly covered with the repainting varnish break down (progressively) under the action of the acid. Areas which are too thickly overpainted cause too wide a platform ("[b]urns") to appear next to the character; its edge will pick up ink and the thick area of varnish must be scraped back to the vertical wall of the character or platform before the etching can continue. Scraping back such areas is more practicable in a relatively open design like this one, but it risks minutely scratching or puncturing the protective blanket of varnish, resulting in foul-biting or erosion of the critical edges of the characters. Any of these minute accidents are likely to escape detection in work of this scale.

If a plate is watched constantly while in the acid bath (which is perhaps unlikely, considering the length of time required for etching with a mordant of reasonably safe strength), the effervescent action of the nitric acid Blake used would show bubbling in areas supposedly protected by varnish and so signal trouble. However, in designs like this one particularly, the proximity of the relatively large areas of the plate undergoing open biting to the sides of the protected characters would make it considerably more difficult to trace bubbles to (minute) areas defectively painted or otherwise opened (especially for fine lines with bubbling arising on both sides). The very density of design in most of the *Songs* makes it likely that such erosions would go unnoticed for some time, and the condition of the surface bears it out as a constant problem. The fact, too, that some of the repainting was done partially, across the characters rather than evenly over them in the usual way, points to remedy of local problems.

It is also possible that a defective batch of varnish or some unnoticed grease on the plate itself might have caused the painted design to lift off the surface (and require local repainting to repair it). There are also signs that the acid used after this local repainting, and possibly before it, was unusually strong.

7 (to the right) *America* a fragment: (Plate photographically reversed.) Enlargement of the central portion of the plate to make visible the slight signatures of the etching process. See also illus. 6 and 9.


in his mighty tent;
to America's shore,
who rise in silent night,
Gates, Franklin, & Green,
from Albion's fiery Prince.

All the signs, then, point to the conclusion that the traces of set I are the effects of repainting done in the course of a mending process when (untypically, judging from the electrotypes) Blake's first repainting began to give way under the action of the acid.

The second set of etching characteristics cannot at first be detected by normal eyesight, or usually, even with a strong glass, unless one has practiced looking for things of that kind. Set II consists of a number of minute traces of a repainting prior to the areas marked out by the obvious platforms of set I and preserved within them. That these traces are not more widely in evidence does not tell against the fact that a general first stage repainting occurred. In relatively open areas like those of the *America* design, it is essential to minimize the ledging effect of the first repainting and cover only the character surface wherever possible. What counts as a trace is the presence of any distinctive contour of copper which, given the action of the acid, should not be present unless protected by varnish.

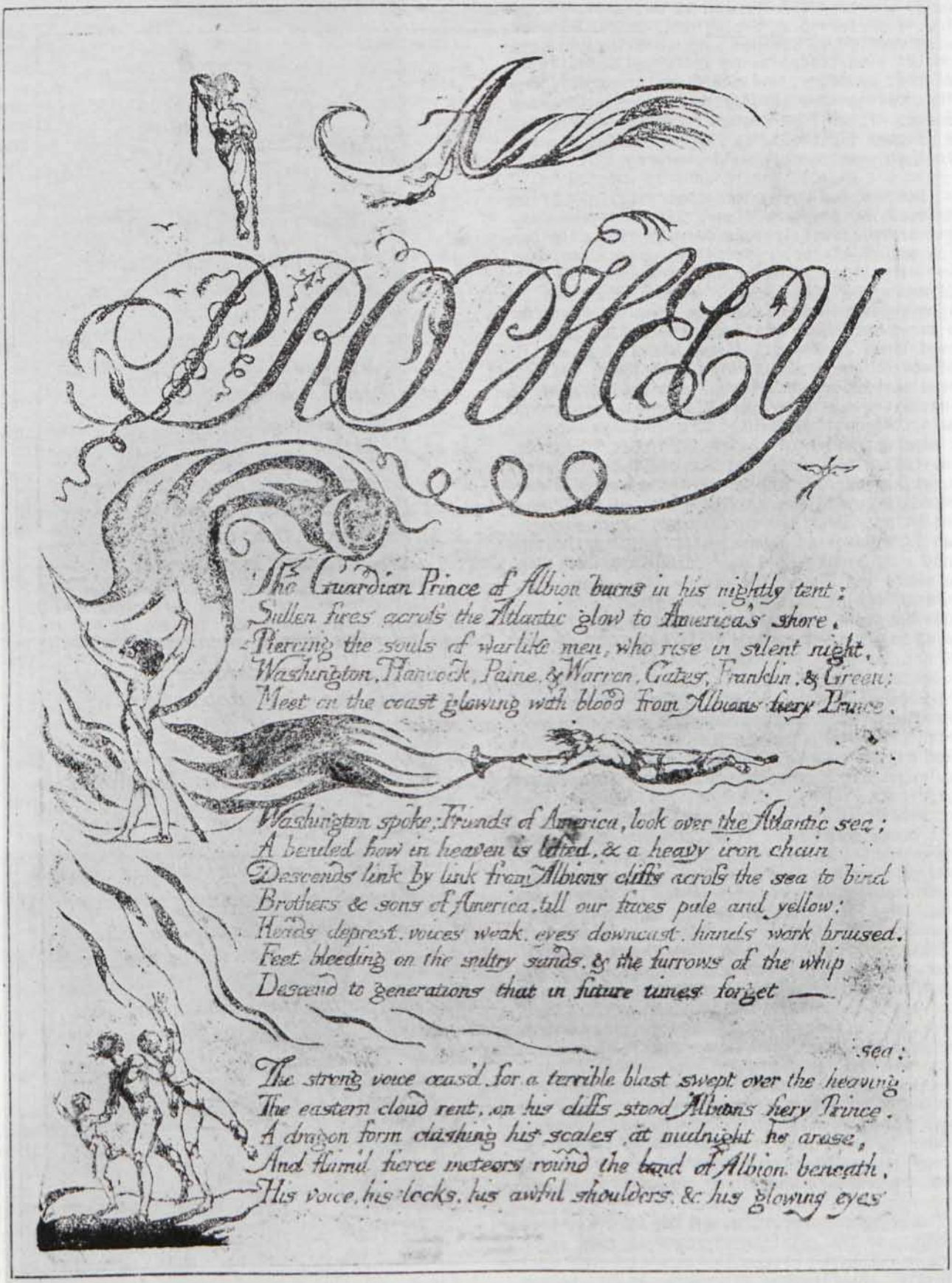
In their depth and exactness these set II traces resemble closely the stage 2 repainting signatures of the electrotypes. Some of them can be seen (where the photographic lighting has permitted) in the enlargements reproduced here. By a very close examination of the plate with a 7-X lens (a stronger one would be better), I found them around *r* and *s* of "[b]urns," the *s* of "his," the *A* of "America's," the *bi* of "Albion's," the *fi* of "fiery," the *ri* of "Prince," notably within the circles of the *g* and at the upper side of the tail of the *t* of "night," and elsewhere. On the enlargement, illustration 6, these traces appear most clearly within the triangle at the top of the *A* of "America's," within the *g* of "nightly" and "night," at the bottom left edge of the *i* of "Albion's," at the bottom of the tail of the *i* and at the right outside edge within the platform area of the *y* of "fiery." Minute though they are, marks of this kind cannot occur accidentally in the etching process and must, therefore, be the effects of a general repainting prior to that of the heavier platform areas within which they were preserved. In every case these traces are so close to the edge of the surface of the characters or in positions so well guarded from contact with a roller or inked plate that, unlike the edges and interval areas of the set I traces, they present no printing problem despite their nearness to the surface. A moderate excess of ink on an inking plate or roller would spread first to the set I edges as is shown by "[b]urns" and several other heavy characters in Blake's proof (illustration 8). In shape, location and depth, these traces bear the signature of the first repainting process.

The third set of etching signatures poses a more difficult problem of interpretation. Physically they vary considerably in area and form; they are in several instances more evident than the traces of set II, and they are located below the platforms of set I, which might signify that they were made at a later stage of the etching process. Their extreme shallowness (making them useless as relief platforms), however, as well as their absence from areas where they might be expected to occur if they belonged to a later etching stage, could tell against that presumption. To make these problematic characteristics clear and useful for further study, it seems advisable to treat the interpretive questions raised by them in the form of a pair of qualified hypotheses based on the physical characteristics of these traces and the technical means by which they might have been produced. These traces are, in any case, actual effects produced by Blake's process, and either of these hypotheses confirms the account given earlier of his use of stepped-biting and repainting. According to one of the hypotheses the traces belong with those of set II (that is, to the first repainting); according to the other, they signify an interrupted and unfinished second general repainting (stage 3) undertaken in the usual way after the mending process evidenced by the set I traces had been completed. (They cannot belong to set I.)

The signs of etching that compose set III are to be found spread around on the basin of the plate at the sides of the characters and nowhere else. On the complete enlargement, illustration 6, they can be seen around the loops of the letters of "Prophecy," cut off at the top, around and within the human figure and, especially around the line trailing from that figure. They are also to be found around such letter groups as "silent," the *s* of "his," "nightly," "tent," the *s* of "America's," "shore," the *t* of "to," the *e* of "rise," the first "in," "silent," "gates," and with singular thickness around the *A* of "Albion's," and so on. In illustration 7 they appear most clearly around the flying figure, the first "in," "tent," "gates," and the *A* of "Albion's."

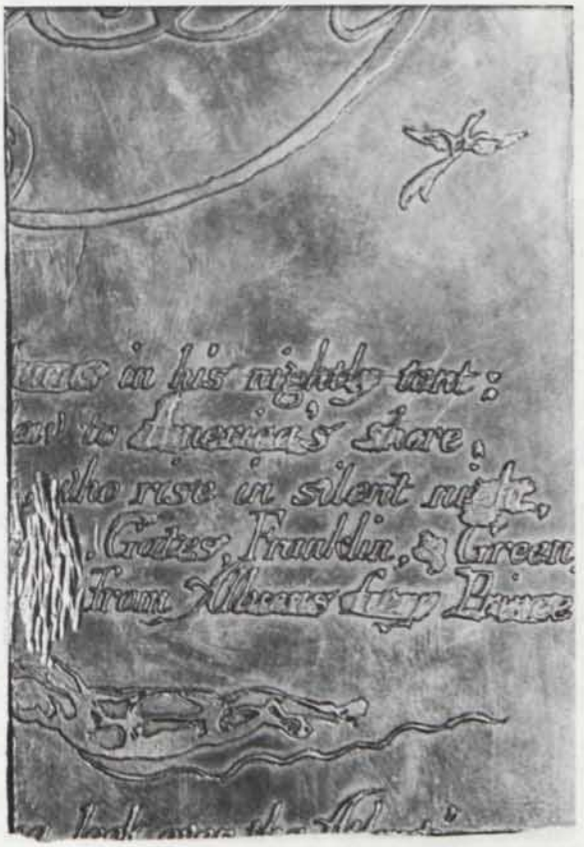
Like the traces of set II these marks are all but invisible to the unpracticed or unaided eye. On the enlargements, again, as the angle and lighting permit, they appear as a discontinuous series of irregular and very slightly raised mounds of copper; they are uniformly located outside the deep (dark) groove which marks generally the base of the etched characters and platforms. That groove marks the place where the acid, characteristically, has bitten in more fiercely than elsewhere because it worked on the larger area of exposed copper formed by the intersection of the sides of the characters and the basin area. It is physically impossible for traces of a wanted repainting

8 (to the right) Blake's proof print taken from original, cancelled plate for *America* a: Effects of ink spreading out under pressure of printing from the too shallow or incompletely mended characters can be found at several places. See, in addition to those appearing in the fragment and discussed in the text, the heavy ink look of "Albion's" and "cliffs" (1. 8), "future" and "times" (1.12), and "Albion's" (1.15). For shadow-line or double contour effect of platform edges which print as dots paralleling the character lines, see especially the right tail of the bird at the left and the lower portion of the initial curve of the capital at the top.

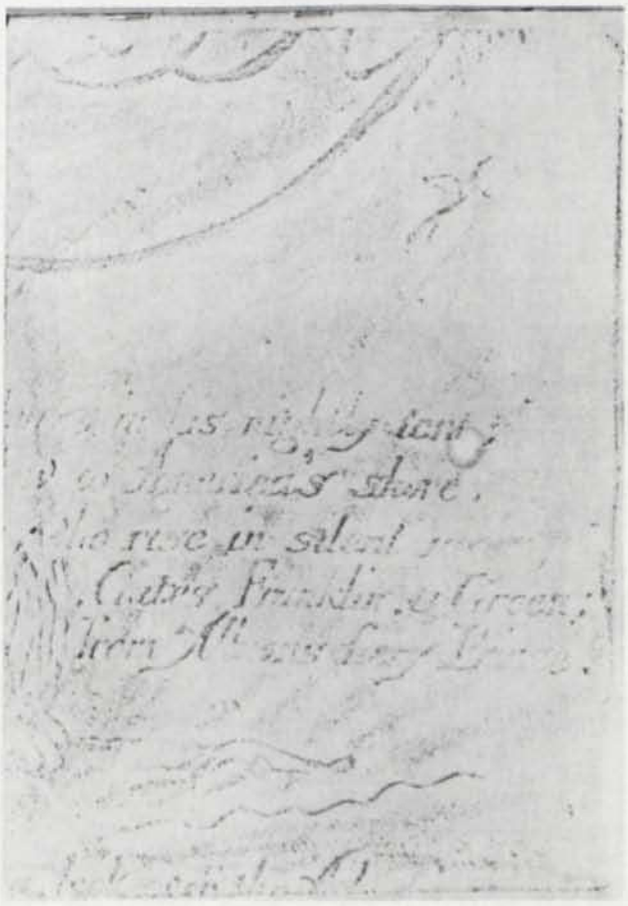

A PROPHECY
The Guardian Prince of Albion burns in his nightly tent:
Sullen fires across the Atlantic glow to America's shore,
Piercing the souls of warlike men, who rise in silent night.
Washington, Hancock, Paine, & Warren, Gates, Franklin, & Green;
Meet on the coast glowing with blood from Albions fiery Prince.
Washington spoke: Friends of America, look over the Atlantic sea;
A bended bow in heaven is bent, & a heavy iron chain
Descends link by link from Albions cliffs across the sea to bind
Brothers & sons of America, till our faces pale and yellow:
Heads depress, voices weak, eyes downcast, hands work bruised,
Feet bleeding on the sultry sands, & the furrows of the whip
Descend to generations that in future times forget —
sea:
The strong voice ceas'd, for a terrible blast swept over the heaving
The eastern cloud rent, on his cliffs stood Albions fiery Prince,
A dragon form clashing his scales, at midnight he arose,
And flamd fierce meteors round the land of Albion beneath,
His voice, his locks, his awful shoulders, & his glowing eyes

prior to that etching stage to appear outside the groove; wherever the varnish is put down, the plate below is preserved as a platform, unless some unwanted varnish is scraped back to allow the acid to bite. The traces to be explained do exist outside that boundary, and the first hypothesis requires seeing them as effects of such a scraping process. It will be useful first to describe a few of them together with the circumstances of painting by which they were produced.

The top and bottom sides particularly of the line trailing from the figure at the bottom show signs of relatively slight overpainting of a type which occurs characteristically around such long, thin, wavy lines. The brush hairs spread over the edge where the line curves change or the hand shifts and the load of varnish tends to run off the narrow plateau. By contrast, the broader curved lines at the top of the plate supported the movement of the brush more securely, and the traces of the scraped areas are really marked only at the points where the line sharply changes direction. (Again, the spillage proves the line was repainted.) The even character of the rest of that line indicates that Blake aimed, in his usual and necessary way, at an overpainting which did not extend significantly beyond the area of the varnish of the first bite. Something more like a slip of the brush is evident at several other points: at the second *t* of "tent," and where the bottom trailing line meets the hip of the figure, for example. That same effect or perhaps the effect of an overloaded brush is evident around the bottom leading line of the *A* of "Albion's."



We have already seen in the electrotypes that the traces of a first repainting are evident only where the varnish spreads over the edge of a repainted character, thereby preserving some of the copper at the base of this very shallow platform as a ledge. Some plates show more of this second stage effect, *The Divine Image*, for example; some less, as in *On Another's Sorrow*. The question didn't occur to me when I was looking at the electrotypes, but I have not yet found on the photographs of them any signs of a first repainting done as crudely as some of the set III traces of *America* are. But that should not automatically tell against the first repainting hypothesis: the repainting of "[b]urns" and "fiery" and the like is also poor by the electrotype standards, as are some of the other characters on the proof but not on the plate fragment. The absence of this sort of undesirable trace from the electrotypes might be owing to the fact that those plates were etched twice after the first repainting. Had such big slips occurred they would have been scraped away before or after the etching. Traces of a scraping process prior to further etching would probably have been reduced very considerably by subsequent etchings; as would those of the *America* plate had it been deepened further in the usual way.



The physical properties of the varnish, copper, and acid, and the relationship between them are important technical circumstances which bear on the possibility that the set III traces really belong,

with those of set II, to the first repainting. Varnish has oil as its vehicle, and the presence of any oil or grease on a plate impedes the action of any mordant (an effect frequently found in the electrotypes). The visible traces of excess varnish can be scraped away if one wants to correct an area on a painted plate--i.e., open it for biting--but the scraping process is tricky both because of the risk of damaging the design and because of the likelihood of leaving an oily residue. (Even the grease from fingers will form a mild resist on the surface of a plate and permit a fingerprint to be etched into the surface. One such fingerprint appears above "nightly" on the *America* plate.) As the acid lowers the surface of the copper, the greasy area is lowered as well, but at a rate slower than the area around it, resulting in the slightly raised areas of copper which constitute the traces of set III.

It is possible that the set III traces were scraped back during the first repainting process because, had they been etched, they would have caused ledging even worse than that evident in the set I traces. The chief objection, beyond the delicacy of the scraping process, to this conclusion is comparative; the width and crude form of many of the set III traces is unlike the effects of Blake's usual masterful first stage repainting. But accidents will happen. The real force of the first hypothesis must be determined in part by the qualifications which must attend the second one, according to which the traces are effects of a typical, general, second repainting made after the mending operation of set I had been established in relief.

The set III traces appear in the basin area as the lowest raised material on the plate, as well as outside the etching grooves; their shapes and general qualities resemble the effects produced by the third repainting and etching effects on the electrotype plates. (Compare, for example, the traces below "gates" and around the line trailing from the trumpeter with the lines dividing the stanzas in *The Echoing Green* and *The Lamb*.) The fact, however, that they do not appear more frequently outside the primary platforms of the characters raises a question about their function which must qualify acceptance of the second hypothesis.

Many of the finer lines used as tailpieces or as the ends of the letters--the top of final *s*'s or the bottom curves of the *t*'s, for example--

9 (to the left) *America* a fragment: (Plate photographically reversed.) Photograph in actual size of plate and print in Rosenwald collection. The incompleteness of coverage and reticulation of the ink of this print indicate that it was produced by the method of plate to plate inking--a condition required, as I see it, by the extreme shallowness of the partial relief established when Blake in this case took his proof from a plate that was going wrong. See also illus. 6 and 7.

are already at a limit of thinness. Without another repainting they could easily be damaged by undercutting during the stage 3 etching to follow. The electrotypes show that the second general repainting frequently covered the sides of the characters needing special protection. So Blake was probably more particular in repainting some characters at this stage than he was in repainting those actually marked by the set III traces. More difficult is the question why he gave the plate so brief an etch at that point, because the bite was obviously interrupted before it had lowered the basin significantly, and the plate was then, presumably, cleared of the varnish so laboriously applied to take the proof.

Actually the relief he had already obtained by the first bite plus the special bite used to establish the mending platforms is nearly as deep as the relief obtained by the first two stages of etching in the plates for the *Songs*. He could have taken the proof with much the same effect after the etch of the mending process. Could he have miscalculated this and wasted the considerable amount of time required for so fine a general repainting as must be supposed according to our second hypothesis? I think not. It is much more plausible that he meant to complete the second general etch (stage 3) in the usual way but interrupted it for a reason which I will formulate with the conclusion.

In summary now, the location, width and ragged-edge characteristics of the set III traces closely resemble the signatures of the second general repainting of the electrotypes, but their frequent absence from areas where such repainting would be most needed, and the oddity of a (hypothetically) very careful repainting not etched to a significant degree, weigh against the second hypothesis that the set III traces really belong to the usual stage 3 treatment of the plates.

I conclude that the *America* plate was not completely etched before it was abandoned. The technical problems that doomed it probably included physical ones, such as a bad batch of varnish or too strong an acid, and spiritual ones, such as doubt about the design itself. These problems, along with the different etching requirements of the more open design of the fragment, caused Blake to vary the repainting and stepped-biting techniques (also used for the *Songs*) that he had invented for his relief-etching process.

If we accept the first set III hypothesis about the manner of etching the plate, we can only conjecture that further biting was planned. We might then suppose that the three- to four-stage etching process was not a general rule. (Perhaps the surface characteristics of various sets of pages can bear that out eventually.) But the hypothetical scraping and the uncharacteristic crudeness of the traces of, in that case, the first repainting process tell against that conclusion; whereas according to the second set III hypothesis the scraping is eliminated and the quality of the traces is comparable to the elec-

trotype traces. It seems simpler and more consistent with this other evidence to suppose that doubts about the design were primary in his decision not to continue the second general etching to the usual depth. Had he wanted to use the plate, he could have scraped away the set I problems after all the etching was completed; no convenience of technique or amount of labor is sufficient explanation for abandoning a work.

The first *America* plate, then, was stopped because Blake saw it didn't work as a design. The second general repainting had been done. The etching problems he had encountered--plus perhaps the new design formed by the varnish at that point--led him to see his original design differently and then to make the one he printed in *America*. By comparing the prints of these two versions of the *America* plates with other related designs, one can see why Blake changed his mind in this case.

The significance of the evidence of Blake's repainting and stepped-biting technique for making the *America* fragment has many sides. It confirms the hypothesis formulated from the electrotype evidence and clarifies the method his medium required. The fragment may eventually provide a broader basis than the electrotypes alone for discerning and appreciating what went on in the course of making the later Illuminated Books. Broadly speaking, this whole range of evidence has a geological or archeological relation to the finished pages. This relationship could help us determine, for example, which plates or prints Blake had trouble with and why; it could provide considerable evidence about the care with which copies were made. Correlating the etching signatures with printing signatures will provide a whole new kind of evidence about what was made; hence, we may be able to discover the state of the plates from the presence or absence of patterns of ledge or basin marks in prints.

Conclusion

But more immediately, the general hypothesis of a uniform or usual method of production involves, as we have seen, at least two and normally three minutely particular paintings of a plate. Sometimes every character and always each of the more distinct (isolated) details of every design were recovered twice. A third or sometimes even a fourth painting at the lower levels of their substructure produced radical transformations of the imagery of the plates as he worked on them. With those changes of configuration came a special awareness of a process in the method. Chronometrically, as a count of the number of times he applied himself to painting his designs, Blake's plate production might be reckoned at two and one half to three times what it has been thought to be; horologically, the reflexive, practical effect of the method on the artist who used it can be estimated qualitatively in terms of the cumulative effect of light-years of most intimate communion with the golden land, burning sea, and bright, reflecting sky of his technical environment. Patterns of perseverent individuality in his minutely expressive forms became known to their painstaking and inspired creator as a family of visionary figures whose real life is by no means confined to the illusive heaven of his problematical "meanings." The self-reflexive, gestural quality of the final plate of *Jerusalem*, for example, should be appreciated not only in relation to the other ninety nine designs of that work, but also in relation to all the other plates, prints and pages of the Illuminated Books and beyond: it speaks of the hammer and foreps of the labor of the process of coming and going in the spirit through which, in Blake's polymorphous freedom of verbal and visual metaphor, all the Illuminated Books were realized in a medium of visionary re-enactment whose technical base lay in the archtropal matrix of his plate-making process.

From the beginning Blake was aware of a many-sided practical symbolism in the antithetical modality of his newly invented means of production. Aspects of that initial awareness can be constructed or inferred from the evidence we have. But Blake would certainly not then have envisioned a cumulative symbolism in the minute particulars of the medium itself; for it was only by his ardorous and immense labors in that medium that he could have come to see, as I believe he did, in the stages of his process and in the cosmography of his sculptural plates an analogue or emblem of the layered structure of the hierarchic, allegorical system of the cultural world he sought to anatomize and to represent by transfiguration. The pertinence of his later thematic system of wordings to the *Songs of Innocence* and other earlier works has been doubted many times (without any attention to their visual relations). But *The Book of Thel* itself makes specific use of the layered and polysemous structure of allegorical design, and its pictorial forms hover between being symbols and emblems. That is another story, but it may help call attention to the influence very early of Blake's method of making one by one his revisionary plates for the *Songs of Innocence*. From that process, I am convinced, he became aware of a poetics of inscription inherent in the means of production in his medium. Its conditions enabled his visions to be "printed" and his readers' "perceptions" of them to be seen in a new light, one which could treat metaphorically as tropisms the familiar modes of artistic production and response.