Writing at the Computer

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THE SUDDEN availability of microcomputers in only the last few years seems to bring with it a discernible change in what might be called the psychology of composition. Computer technology is characterized by extreme rapidity of change: in the months in which I have worked on this essay many new sorts of both computers and software have appeared, and more will appear between my finishing this essay and its publication. I want, however, to discuss those aspects of writing at the computer that are fundamental and not likely to change greatly.

It's a temptation to call my thoughts "Writing in the Age of Electronic Reproduction," to echo Walter Benjamin's prescient essay, published in 1936, "The Work of Art in the Age of Mechanical Reproduction." Replacing the noun "work" with the gerund "writing" may seem a slight change, but it hints that the parallel is only apparent. Benjamin argued that the technological ability to reproduce works of art in quantity not only had affected our way of perceiving unique original works but also would influence future social and political life, through a largely irrational and destructive substitution of image for substance. His essay remains a more telling commentary on recent American television politics than much that has been written subsequently:

> Since the innovations of camera and recording equipment make it possible for the orator to become audible and visible to an unlimited number of persons, the presentation of the man of politics before the camera and recording equipment becomes paramount. . . . Radio and film not only affect the function of the professional actor but likewise the function of those who also exhibit themselves before this mechanical equipment, those who govern. Though their tasks may be different, the change affects equally the actor and the ruler. The trend is

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toward establishing controllable and transferable skills under certain social conditions. This results in a new selection, a selection before the equipment from which the star and the dictator emerge victorious.

Benjamin's essay and the present topic might suggest an analogy between the way the technology of modern printing, photography, and film has changed our perceptions of original works of art, and the way in which the computer has changed our perception of the printed (or, more generally, the mechanically preserved) word. But the analogy turns out to be false for three reasons. First, the written word had already been transformed before the coming of the computer by the sheer quantity of words that modern bureaucratic and commercial society produces. This flood of language can in itself be regarded as the progenitor of the computer's application to words and texts, for the computer is from this point of view merely a technological response to the need for a faster way of processing information; that is, of producing and disseminating new written material quickly enough for it to ride that flood, and, conversely, of searching the flood for the particular floating bits that are wanted at a given moment so that they can be manipulated. By contrast, earlier there was no analogous artistic flood which called photography and film into being, nor an analogous flood of nonartistic images. It seems significant to the current state of the written word that the largest publisher in America is reputed to be the Citibank corporation.

Second, an analogy with the "mechanical reproduction of the work of art" is false because, while the computer certainly changes the manner in which written works are accessed by readers, for the most part it has only affected the productive methods of those persons already immersed in the flow of information involved in industrial production, sales, management, governing, research, and so on. The rest of us have been affected in our roles as consumer, voter, and so on. Most people don't employ the computer to generate or manipulate information; rather, they read information that has already been manipulated, often by computer. I mean

first of all manipulated in the simply mechanical sense, in newspaper offices, for example. But also, inevitably, the manipulation of texts follows from the manipulation of meaning. This was no less true, after all, in the age of scribes and copyists. Whatever the computer's usefulness as a writing and editing machine, it does not materially create a new sort of writer, as photography and film created new kinds of artists.

Third, Benjamin concerned himself with how the reception of works of art was affected by mechanical reproduction. Photography certainly did influence how paintings would be conceived (as, for instance, in Caillebotte's famous *On the Europe Bridge*, which, like a cropped photo or a photo of persons in motion, truncates the left-hand figure of a man), and it called into profound question the value of representational painting. But Benjamin's point is that mechanical reproduction drastically changed the accessibility of painted works to audiences by making the original almost unnecessary and by changing the accepted view of what was valuable in a painting—making it the evidence not so much of the work of the artist's own hand or the historical circumstances of a work's creation and preservation, as of those visual qualities least affected by mechanical reproduction: theme, motif, pictorial and narrative interest, ideological content, and so forth; not of uniqueness but of wide emotional or ideological applicability, let's say. The painting not only was influenced by the photograph, but also itself became a kind of photograph, since it subsequently became quite well known in reproductions.

Since the computer's development into a small form that is powerful and not remarkably expensive, it has indeed affected both the production and the distribution of written texts. And if it has not in fact created a new kind of literary artist, it has affected the way in which one artistic medium, language, is manipulated. But to complicate matters, the written works disseminated by computers tend to be valued most for their factual, statistical, or rhetorical (promotional) nature; few if any persons use computers only in order to read literary works. And while the computer permits

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manipulation, especially through creating a false authenticity for documents, it is mostly with the process of writing, not the dissemination of written works, that my remarks are concerned. (It would lead far, if interestingly, afield, to meditate on the startling fusion of falsified computer memoranda and distracting, meretricious TV-screen celebrity in the recent case of the lt. colonel who testified before a joint Congressional committee.)

I once borrowed a technologically ancient portable typewriter whose huge black cabinet unlatched and ingeniously unfolded to make a typing table with short legs, on which the tall narrow black typewriter itself, unbudgeable and iconic, sat as if on an altar. The friend who loaned it to me had dubbed it "John Reed's typewriter." The appropriateness of his tying the typewriter to the observer of social and political revolution, and even to change generally, seems all too apparent. Now I see also that this typewriter was a transitional device between the earliest typing machines and the portable computer. Or, as Borges might have said, the portable computer has changed the portable typewriter into its precursor. The portable typewriter reflected the writer's desire to carry his writing machine with him everywhere, into the field—to bring the convenience of the machine and, perhaps more important, the validation of mechanized script to the immediacy of the process of composition.

It's interesting to recall the reactions of the poets T. S. Eliot, Ezra Pound, or Charles Olson to using the typewriter, and their work habits at it. They broke with the earlier habit and image of the poet; they seem to have enjoyed the relative ease of composition and the freedom apparently conferred by the rapid producing of an intelligibly scripted draft. Pound's and Olson's poems and letters depend dramatically on the typewriter, which Olson thought would revolutionize the process of writing. His definition of *process* in his famous 1950 essay "Projective Verse" associates it with such impulses as

> get on with it, keep moving, keep in, speed, the nerves, their
> speed, the perceptions, theirs, the acts, the split second acts,
> the whole business, keep it moving as fast as you can, citizen.
> And if you set up as a poet, USE USE USE the process at all
> points, in any given poem always, always one perception must
> must must MOVE, INSTANTER, ON ANOTHER!

Perhaps here the significance of using "writing," a gerund, as opposed to Benjamin's motionless substantive "the work of art," is clearer.

The typewriter worked on an expanse of paper of a given size; Olson, surely not coincidentally, conceived the poet's work as one of composing, as he put it, in a "field," which I take to be in part a backwards reflection, a retroinfluence, on the creative imagination, of a mechanical requirement of the machine. While poems composed in the memory or by hand may have suffered various constraints, the size of standard paper was not one of them: Keats and countless others scribbled on any available scrap; Poe glued sheets end to end to make possible a continuous manuscript of a long poem. With the typewriter also came a difficulty in throwing off the expectation of seeing printed works mostly in books—which can be inferred from the passing mention in the 1911 *Encyclopaedia Britannica* of an early typewriter designed to type in the pages of a blank bound book. This is a kind of late, fleeting echo of the perceptual limits of the first printers and their readers, which required the earliest printed books to resemble manuscripts. Olson's ideas show us another moment of transition, from the manuscript to the typescript.

Olson's metaphor of the field suggests both movement through a defined space and the placement of objects within that space. He describes the typewriter's advantages this way:

> From the machine has come one gain not yet sufficiently observed or used, but which leads directly on toward projective verse and its consequences. It is the advantage of the typewriter that, due to its rigidity and its space precisions, it can, for a poet, indicate exactly the breath, the pauses, the suspen-

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But it was even more than precision and the notion of writing as process that seemed to attract Olson. Some of the evident pleasure Olson and Pound got from their frequent use, in poems and personal letters, of slang, nonce spellings, and other linguistic high jinks, suggests a boyish delight in the little shock of seeing these words typed at the very instant they are used, because, even as late as the 1950s, such orthographic exuberance still implied defiance of the conformity of correctly spelled words in published work. This revolution was meant to be fun, a highly significant contrast to the accepted use of the typewriter as an office machine.

The barest history of the typewriter is itself revealing. The pre-World War I, Eleventh Edition of the *Encyclopaedia Britannica*, with an amenable tone that suggests a mild fascination with mechanical ingenuity and even a slightly exasperated but affectionate familiarity with the machines, devotes three columns of history, description, and illustrations to the subject. While patents for typewriters of some sort appear as early as 1714, it was not until the mass-produced Remingtons appeared in America after 1878 that the machine could be regarded as an available technological reality. (The same company manufactured guns.) The encyclopedia article gives no explicit information about the alteration of social and economic life—business and law, for instance—by the typewriter. And in 1975 *The New Columbia Encyclopedia* summarizes the same history and adds an approving comment on the electric typewriter, which dates from 1935, but also says nothing about the effects of this extraordinarily momentous invention on modern life. Can we expect the microcomputer to occasion no more pondering than this in future reference works? A contrast is provided in any number of magazines and books on the personal computer, where the question of the machine's influence on its user often arises, if not exactly within a context of critical analysis. For, of course, owned and transported like a typewriter, a microcomputer—with

powers which only a few years ago were not possessed by individuals but only by institutional mainframe computers—brings with it an even greater shift in the habits of writing and reading than the typewriter ever caused.

The anonymous *Britannica* writer, apparently with firsthand experience at the typewriter, noted with a tone of knowing superiority that although the machines then in use did not always make it possible to see immediately what one had typed, "to the practised operator it is not a matter of great moment whether the writing is always in view . . . for he should as little need to test the accuracy of his performance by constant inspection as the piano-player needs to look at the notes to discover whether he has struck the right ones." This passage suggests two observations on both the typewriter and the personal computer.

First, the machine imposes change on the writer. The *Britannica*'s analogy, depending on the word "keyboard," is perfectly false. Appropriate verbs are necessary: I play the piano and I use the typewriter, not vice versa. If I perform music, it is the performance of a piece of music; if I perform at the typewriter, I am judged by my bare mechanical competence in the accurate typing of words, while my performance at the piano, if it is to have any value, must amount to considerably more than not playing wrong notes. The typewriter sounds no audible notes, and the gradual mastery of it does not depend on the operator's immediately seeing, as the pianist immediately hears, the error of an individual key, or note, when it is struck, but on his perfecting a routine positioning and use of the fingers. The piano, vehicle of an art of interpretation, has as its end the presentation of a perfectly performed work experienced in time; the typewriter has as its end an increased speed in the accurate recording of information for the sake of some future moment of reading. Olson's comparison of poet to musician, with regard to a standard notation available to each, is not so far from the *Britannica* writer's false analogy, even though Olson is comparing notation, not performance.

The encyclopedia writer's attitude is that of one who would

exhort operators and, as likely, their bosses to fulfill the utilitarian purpose of the machine with no reference to the person using it except his or her accuracy. That is, the mechanical precision of the machine is transferred backward, by analogy, to become the operator's responsibility for accuracy. The person's utility in the workplace becomes an adjunct to the machine's capabilities, rather than the other way around. Historical improvements in the pianoforte made possible richer composition and performance; improvements in the typewriter made possible greater speed. While changes in the piano created new possibilities of playing, the changes in the typewriter imposed new ways of fulfilling the jobs of scribe and clerk.

Of course the computer in its turn seems to promise great savings in labor for the operator. Yet one of the most common conclusions of those who work with personal computers is that they do not always accomplish what was hoped for by those who developed or disseminated them: that they would improve efficiency—at least, not as efficiency is most simply envisioned. For the first aspect of the personal computer is that, while it does save mental and physical labor in some impressive ways, it also creates labor: the labor of learning to use the machine and its changing software, and the labor of learning and performing a variety of computer housekeeping tasks necessary if what has been written and analyzed and computed is to be identified, organized for ready retrieval, prepared for transmission over phone lines, "encrypted" and "decrypted," updated, copied, sorted and otherwise manipulated, transformed into other forms, protected against loss, and so on.

Like the typewriter, then, the computer not only imposes a certain amount of machine-specific work on its operator, but also demands a certain alteration in work habits, an adjustment to the machine—even though the machine does not depend entirely on the manic exigencies of office or factory for the authority to enforce such changes, but enforces them itself, through its operational requirements, even on the solitary writer. If the early typist was

chided for wanting to see the letters he had typed, then the computer user may be chided—by those more familiar with its use and more influenced by its nature—for wanting to be able simply to speak to the computer and get it to do what is wanted. Indeed, programs and equipment that allow the computer to respond to spoken commands, and to issue spoken responses, already exist, but they cannot yet be applied to any but the most basic computer tasks. Instead, the operator must learn much: the computer responds to programs and, within these, to typed commands or possibilities designated with an electronic pointer manipulated either with the keyboard or with a movable "mouse" beside it, the animal designation (it's Mickey!) intended to make the device as welcome as a helpful little toy attached to the more ambiguous—half helping, half threatening—machine.

We might have noted, above, that it took a surprising number of years from the invention of the typewriter and its widespread use in business and government for the phenomenological implications of this writing machine to come fully to consciousness in Olson—who, as a poet, saw its usefulness in fulfilling a need of no consequence to office workers. One may suppose that this long delay was imposed by the very thoroughness of the typewriter's subordination of its operator. It was Olson, a poet but one who knew offices, who conceived in theoretical terms a higher purpose or usefulness for the typewriter. One wonders whether the computer will find its Olson—not only a creative writer who will link his or her work inextricably to the nature of the machine, and whose habits of composition will thus in some fundamental way be determined by the machine, but also one who produces work of substance whose essential nature validates such a link. And even Olson's peculiar esthetic of typography seems to have died with him; later poets who acknowledge his effect on their own work have not had much to say about typewriters.

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ciency. Tied to the development of talking computers, the recent development of "user-friendly" "artificial intelligence" programming that enables the computer to respond to simple typed English commands and requests seems to be an acquiescence to the partial failure, so far, of the inefficient "interface" between computer and user. For now, if the many different available interfaces are to be successful, some shift in the human operator's attitude is required, and it involves a new vocabulary. The common substitution of *word-processing* for *writing* may be meant to suggest only the computer's ability to manipulate words and texts in various ways. But the neologism establishes language as a kind of quantifiable material to be manipulated by computation. *Compute* comes from Latin roots that pertain to mental operation, whereas *write* derives from roots—which we will look at in a moment—that suggest a materiality, a physicality, a kind of action. Thus efficiency has its own nomenclature, which redefines both things and language itself.

In Western industrialized cultures, efficiency is one of what Douglas Hofstadter, citing the biologists Jacques Monod and Richard Dawkins, calls *memes* (the word is Dawkins's). A meme is a "self-replicating idea" that survives by causing itself to be imitated and thus established successfully in many "host" minds; the analogy is to a virus. Hofstadter quotes Dawkins's book, *The Selfish Gene*:

> Examples of memes are tunes, ideas, catch-phrases, clothes fashions, ways of making pots or of building arches. Just as genes propagate themselves in the gene pool by leaping from body to body via sperms or eggs, so memes propagate themselves in the meme pool by leaping from brain to brain via a process which, in the broad sense, can be called imitation.

The meme of efficiency—an entire set of related concepts and goals that in our society is powerfully tied to machines—has been extraordinarily successful in establishing itself. As one of those infected by it, I can at once diagnose and even disapprove of my infection and yet continue at the same time to benefit from and

even occasionally enjoy it. After all, I *am* infected, which means that efficiency has found a hospitable spot in my mind.

Monod had written that the success of certain memes comes from "preexisting structures in the mind, among them ideas already implanted by culture, but also undoubtedly certain innate structures which we are hard put to identify." The quest for artificial intelligence, the desire to create computer programs that will produce such refined computational responses and inquiries that their aggregate will resemble what we call intelligence in ourselves, is one of several powerful memes in the computer culture, including notions revolving around complex efficiency, speed of calculation, and miniaturization. These are the very memes that most touch the writer at his or her computer, too, and may well require an adjustment which, for all its lightness or subtlety, substantially alters how one writes, and at some deep level, what one writes. (I have heard a public relations person complain about what was in reality a decent piece of writing by saying that it needed to be more user-friendly, and I suppose this evidences a thoroughgoing acceptance by the unwitting flack of a quality desired properly only in a machine.)

A second observation follows from the *Britannica* author's comment on typist and pianist. In what *manner* does the computer alter the computist? It frustrates a routine expectation by denying to the unhabituated user something he or she would certainly have taken for granted: physical access at any time to the tangible body of what has been typed. First of all, the writer is no longer typing the document; it is not the purpose of typing at the computer keyboard to produce a legible, nice-looking copy of a document. Neither metal nor ink nor paper nor even plastic comes into play. That task has been automated and at a later moment is directed by the computer itself, and called *printing out*. Rather, the writer who is a computer operator (now *user*) is composing a text to be held in a device analogous to memory, so that at a future moment it can be printed out and presented physically upon demand.

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different physical reality, to some extent at the keyboard, and certainly when viewing the screen. At the computer, one cannot see everything one has already written; it is recorded on a disk or held in the computer's electronic memory, and while one may have nearly instant access to any portion of it, one cannot, except on special and very expensive equipment, see more than about twenty lines of it at a time. All the rest of the already composed words remain invisible. Not written, one might say, but digitized, numericized, some such word as that: encoded as binary numbers, along with all punctuation and custom of the written word; although the vocabulary of computing includes *write*, as in to "write a file to disk," this *write* has become a metaphor, perhaps one already dead. There is no stack of typed sheets lying next to the typewriter as one works, but instead a disk (floppy or hard) spinning out of sight inside the computer.

Not only do computers necessarily transmit all forms of data, including text, through the tiny window, if I may call it that, of the binary number system (which of number systems is the most bland, the most lacking in texture and historical evolution both as idea and as script). More apparent is the fact that computers, unlike any other common form of transmittal of written information, also deprive the writer of any sense of the accumulated physical bulk of a piece of writing, and require the work to be viewed as if through another window, the glowing screen. No lamp is needed to see one's work; one writes by one's own electroluminescent light.

The feeling of this is quite strange to the habituated reader or writer, as perhaps it may not be to those who have grown accustomed to personal computers without much previous habit of reading or writing. One can easily adjust to scanning bibliographic records on a computer screen; but imagine reading a novel that way. Even if one's eyes could accomplish it without failing, one would have no sense of the size of the book, nor of the size of each chapter in relation to the whole (except by estimating, also on screen but at another moment, how large the file is, given its size

in bytes). This proportion, for all its obviousness, is very important, and in itself conveys something of the place of that novel in the tradition of novels and in the history of writing, publication, and reading. Question: What sort of novel would the computer make possible? Answer: since the computer's forte is the manipulation of data, then the sort that allows the reader to choose among prescribed options how the narrative will branch, develop, and conclude. Such "novels" already exist.

Another example: on the computer one can keep notes in such a fashion that finding the word, idea, or reference one wants to recover somewhere in their midst is only a matter of an electronic event of a few seconds—but one can never see, all at once, the bulk or heft of them or the number of pages or index cards, or handle them, sifting through them half randomly, becoming familiar again with their contents, with the sequence and circumstances in which one took them (pencils, different pens, more or less wear or smudging, at the library, at home, at night, etc.).

Finally, imagine writing a work of book length, working away on a digitized version of it. (Not to disallow the possibility of printing out a complete version and then working at this with pen and pencil, but first such a complete version must be created electronically.) For both the writer and reader, the written work is a kind of vital materialization of language. This is not a notion owned by Marxists; the poet Karl Shapiro put it a little differently: "Poetry is the materialization of experience; philosophy the abstraction of it." The materiality of language is the opposite of the experience of writing at the computer, which instantly transmutes the material effort of writing into innumerable, infinitesimal and invisible electronic changes—any perceptible material result is absent. The level of the infinitely small, at which multitudinous computer calculations take place, has an uncomfortable symbolic correspondence to the tendency of modern government and corporate business to envision persons as statistics. The aggregate of words becomes a *file*, which can be manipulated in many ways; the aggregate of persons becomes a market to be manipulated, too—a popu-

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But the changing of a single byte of electronically recorded information can alter all the rest or destroy it, while one purchase or vote or prayer has no such effect. We cling therefore to our individuality, even as we sit at our personal and even pleasurable computer screens; we do not willingly become ciphers. In "The Poet and the City" W. H. Auden wrote disparagingly of the many young people he encountered who wanted to be writers; but he understood their attraction to the role of the artist. It was not because they felt they had innate talent, but because they admired the artist as one who still had personal responsibility for what he or she made. The young person's "fascination is not due to the nature of art itself, but to the way in which an artist works": unlike other labor in industrial society, the artist's solitary work seems sufficient to itself and thus personally meaningful, while the work available to most people is not. In offering a substitution, welcome to many, of unarguably satisfying computer skills for more arduous writerly ones as the goal of one's learning, the computer and its boosters extend the egalitarian illusion that anyone can become a writer. (It is an illusion not because many more people could not indeed become writers, but because their work would never find an audience.) But is the cost, even to the serious writer, partly in the unavoidable and paradoxical dematerializing power of the machine? Is what is produced with its aid deindividualized in some subtle way? Does all writing thus produced become merely a product and thus begin to be drawn, however reluctantly, into the realm of skills readily acquired for industry and service corporations?

That is, are the physical aspects of the work of writing negligible? I don't mean only psychologically, in the moments of writing, but also with respect to one's personal history as a reader and writer, and the evolution of one's thoughts and feelings. The physical textures of the tangible world and of lived time are trans-

formed, in electronic note-keeping, into a form as clean and instantly mutable at any moment as at the precise instant of one's first recording or annotating. An original cannot be said to exist, for it is continuously changed without trace and so has far less historical dimension in the author's life, none of what Benjamin defined as *aura*.

Thus to transform the first stages of one's thinking is partly to remove both the thing studied and one's studying it to a kind of physical abstraction, a state corresponding, if only imperfectly, to mental abstraction. Note-taking and scribbling and revising and second thoughts and reminders become in a way pure and thus less profound. That is, until and unless the piece of writing is printed out (the prepositional tag used in the computer phrase suggesting the necessity to get the electronically preserved information out of the computer or off the disk and into the perceptible realm), it seems to have no concrete existence; its form is so volatile and remote from unaided human perception as to seem vaporous, illusory.

Without this physicality, notes or longer texts lose certain characteristics which I think must be considered essential. No searching at a computer, whatever its electronic speed, can stimulate the mind to make unanticipated connections in the same way as looking through notes physically recorded (even if, contrarily, no physical form of recording can equal the computer's speed in finding already-known quantities, such as key words). One has to ask for what one wishes to see; otherwise, the only alternative is to look through the small twenty-line window as the information moves by.

This necessity introduces another aspect noticed already by some who ponder the interface between the person (who does have a face) and the machine (is it thus implicitly humanized by the implied metaphor?). There are two distinct ways of conceptualizing the viewing of information on a computer screen, neither of which corresponds to how the information is recorded electronically and spatially on the disk. One way is to imagine the information as if it

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were on a continuous imaginary sheet of paper that is moving up or down inside the computer screen window (*scrolling*—a word of exquisite historical irony in this context). The other is to imagine the information fixed in place on its imaginary page, and the computer screen moving, like a diver's face-mask, over it. Either the information moves, or the window does. But in each case one of the elements is always fixed and stationary, and the other moves along rigid vertical and horizontal axes.

Of course, the practical reality of reading—with all the attendant, unperceived and unknown psychic reverberations of our having learned to read and write and our habits of continuing to do so—has no such rigidity except the customarily rectangular shape of the book and the page itself. Flipping back through a typed draft of an essay while lying on one's back on a couch, one's head at an angle and the pages not quite vertical, to find a page where one had written in the margin, so as to connect that annotation, by writing another note, to a fresh one on a subsequent page— nothing truly like that is possible on the computer screen. Instead, one scrolls backward or electronically leaps to the page one is looking for, and then adds the note between lines or in brackets or otherwise, so that the passage can be found later; then one returns to one's point of departure, again either by scrolling steadily or by leaping. There are no true margins on the computer screen. Most word-processing programs do not permit a large scrawled question mark over a point one has come to doubt, or an urgent "EXPAND THIS" to one side; even when they allow the superimposing of windows containing other text, they require that all words in the document or file, however spontaneous or however much they may usefully represent counterarguments, contradictory intuitions, doubts, negativity, and critical thinking, be formatted—that is, be formally incorporated into the rigid rectilinear parameters of typed text, and, so far as possible, naturalized there—made a part of the text, not allowed to exceed its margins, however much it is precisely the marginalia's violation of the typed format that conveys the value of thoughts running counter to the text. That a few

recently released, elaborate and expensive word-processing programs will allow some kind of marginal notes only emphasizes this supreme difference from writing, for this particular feature of the program—touted as a great advance—is in fact a retrograde action against the inherent tendencies of such programs, and answers not to the dominant meme of efficiency at the screen but to hankerings for the former ways of handwriting.

Some thoughts on the physicality not only of writing, but of all the attendant thought-work and hand-work that leads to it:

The spatial, three-dimensional (more accurately, four-dimensional!) randomness of one's desk, on which books, papers, notes, pencils, notebooks, paper clips, pads, are spread, is far different from the succession of reordered instances of sortings of, or random access to, data on computer disks. The pen or pencil leaves on paper the traces of the movement of the human hand: it seems to me that every element of this description is of supreme significance, even if at a subliminal level, to writing. The typewriter creates a mild fiction of finish, of *print* (from root words meaning "to press," thus conveying a physical operation). The typewriter and even computerized printing-out are instances of the universal intelligibility of standard letters, no matter who formed them first by hand, or who would utilize them in any way, rather than the individuality of handwritten words (or, by implication, the individuality of their source). Handwriting is not only a precious token of that individuality but also a record of an individual's time at work writing; its uniqueness reinforces, recreates, and represents individual identity and thus substantiates the writer. Handwriting is proof of the writer's existence. Typing and printing make these letters universally intelligible—thus acceptable, decodeable—and so substantiate, validate, and encourage the reader. They are proof of a written work's existence in the historical time of readers.

We bring forth a text with our writing; we lead the pen or pencil over the paper, and thus we produce the work. The stages of the computer's mediation between writer and finished text are multiplied several times beyond those of writing by typewriter.

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The computer copies what is electronically transmitted from the keyboard, and then writes it to the screen and the volatile Random Access Memory (RAM), whence it writes it to disk, thus saving it; finally it sends the text electronically to the printer.

Further, writing by hand or typewriter produces, in the stages of the evolution of the work, a set of documents attesting to the process of composition over time. Thus writing leaves evidence; it preserves an essential condition or aspect of a written text, which is its authorial historical dimension, its existence in the writer's time and space. And to remove such evidence requires physical intervention, whether inadvertent or deliberate—a suppression, a destruction, or a loss. It requires a destruction of the earlier stages, the drafts—which are the "drawing out" of the words and sentences, as a plough is drawn across a field (again, an act in time). The etymology of *draft* suggests movement, even movement accomplished against resistance; thus the blank page finds its analogy not in the emptiness of the void, as Mallarmé conceived, but in the waiting physicality of the bare field. The very word *verse* derives from Latin *versus*, "a turning of the plow." Olson's "composition by field" is in this light a very appropriate conception.

But writing with the computer means not that the successive stages of composition scribe a field repeatedly, but that each stage in the sequence of revisions obliterates its predecessor (in some cases, depending on the computer program, the last stage but one). The computer breaks a historical chain of association, moves away from the kind of activity suggested by the word *palimpsest*, with all its physical connotations. What now remains is the finished document or file. Most important, the removal of the evidence of each earlier stage can be accomplished not only by deliberate effort or an accidental loss, but also by an automatic and intentional electronic routine to which the program defaults unless prevented from doing so. (It was only the failure of such a routine that preserved the lt. colonel's memoranda for later embarrassing discovery, when they became not only evident but also evidence.) One can of course preserve each electronic version (by giving each a

different name), but this preservation of the earlier stages would require an effort beyond the ordinary. In fact, the computer term for preserving on the disk what one has written is to *save* it. An elementary computer prompt might be: "Have you saved your work?" A novice might understandably ask in reply, "From what?"

The implication, clear to everyone who has worked at a computer, is that computerized work must be guarded, even rescued, from threat. This threat is the complete loss, the material abolition, of one's work before it has become tangible. If the machine is turned off or the power fails, what's held in the memory chips becomes a dead stillness. Those historians who would study the drafts of treaties (including what we might call postmodern treaties: the contracts of international conglomerate corporations, the stipulations of the International Monetary Fund, etc.) or speeches, letters, and memoranda of public figures, have already expressed dismay that the use of computers to write and revise such documents routinely destroys—or rather, fails to save, in a way not always inconvenient to the modern industrial state or statesman—all evidence of the differing stages of composition. The final draft, then, serves not to represent the evolution of a complex moment in history, but to conceal it or overwrite it with a single and in many respects unreliable image, one that may be unassailable in the absence of conflicting evidence.

I mentioned naming a piece of work. More precisely, one names a file. This file name is required for the electronic identification of the work stored on the computer, an identification apart from true titles. This necessity introduces a small, unaccustomed formality into the relation between writer and written word. Sensing an entrepreneurial opportunity here, some companies have produced computer programs that allow the writer to imitate the production of hurried notes, the titling of which would be absurd. Since such programs must be added onto one's word-processing program, they require another round of learning program commands. This would seem the farthest thing from spontaneous writing, and in fact even when the preservation of impromptu notes is

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The enforced formality of the writer's behavior is not in the civil sense, regarding other persons, but in the sense of procedurally precise with relation to the machine. In most word-processing programs the smallest independent hint or fragment of an idea, in order to be saved, must be given a file name; because the computer organizes information and instructions in files, the writer must do so too. Therefore an inflexible sequence of actions at the keyboard must be followed to produce and save the text, in some programs, before the writer can even begin to write. It is a kind of ritual, but of sequence, technicality, and procedure rather than of invocation, inspiration, or gratitude. It is practical rather than intellectual or spiritual.

If, in the old way, you are writing and you stop work, and later you return to it, then—barring catastrophe—you find your desk, your typewriter, and the sheets of paper where you left them. You sit down and try to begin again. But if you want to return later to your work on the computer, you will have to leave the humming machine on and running all that time. Otherwise you must submit to the full routine of starting again: booting the computer, starting (loading) the program, calling up the file, and moving to the right spot in it. It is not the small inconvenience that is most striking here; rather it's the technical mediation between writer and work—a necessary gateway through which the writer must always pass before even the first words can be composed and preserved.

If you need to consult a dictionary, the computer is available for this purpose, but the present limitations of its usefulness are revealing. Computer dictionaries may flag one's typing errors and suggest synonyms, but most are not really dictionaries at all. They contain no etymologies, meanings, or notes on usage. They are merely word lists or thesauruses. So even though the astonishing capacity for helpfully manipulating such information exists, it has so far been used instead to serve a smaller convenience—so as not to misspell a word, or to jog one's memory for a more appropriate

one. The need to know something is subordinated to the need to save time. Inevitably, the utility of the computer is primarily determined not by writers but by business and governmental scribes and the computer-industry entrepreneurs who wish to answer their needs. From their point of view and that of their employers, there is no pressing need for knowledge of a word's roots and past usage; that is a luxury whose consumption of time is precisely what the use of computers avoids. If you're the sort of person who is going to use a dictionary to look up a word you already know, then you'll use a dictionary in book form anyway.

The "John Reed typewriter" prefigured another aspect of the quest for efficiency, or rather of the quest by the meme *efficiency* for further substantiation: the portability and self-sufficiency of a writing device that can transform the words in one's head into a kind of finished, communicable product—preserved with ink and paper and carried by hand or mail, or preserved in the arrangement of electrons and either sent on a disk by mail or transmitted over telephone lines. Even the astonishing present computing power of the small lap-top microcomputers fails to impress everyone; many are longing for a six-pound machine the size of a big book that will do what now requires a machine of desk-top size weighing forty or fifty pounds, and only five years ago was inconceivable. Because, you see, if only we could carry it around like a big notebook, then we could write something down anytime we wanted, we could recover our spontaneity, we could work in a remote cabin or a motel room, we could get around the irritation of taking notes in the library and then transcribing them at the computer, and all these mechanical formalities and civilities would be easier, and we would really be the free creators of our work!

Olson, in the passage that immediately precedes his praise of the typewriter, wrote, "What we have suffered from [till now], is manuscript, press, the removal of verse from its producer and reproducer, the voice, a removal by one, by two removes from its place of origin *and* its destination. . . ." He saw, with a sense of

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irony, that the modern invention of the typewriter—a personal possession of the writer—could restore a preindustrial intimacy to poetry. But precisely because the computer's efficiency brings with it a concomitant abstraction or etherealization of the antiquated ink and noise of the typewriter, and because its final product, even when printed out, can look provisional and ugly, it's not easy to argue that the lap-top answers Olson's desires more fully.

His wish to be in control of the material production of his poem suggests how keenly the writer may feel an insufficiency, even under the best of circumstances, of material involvement in his art. Since William Morris, some modern poets—and small publishers—have allayed this feeling by looking backwards technologically and producing books whose type is set by hand and whose pages are printed by letter-press. The desire is for the anti-industrial, for the physical stamp of individuality, Walter Benjamin's *aura*. The computer now promises to make everyman a publisher, despite the obvious difference between letter-press books and those designed on a microcomputer and printed offset from laser-printer copy. This latter procedure may be the next logical step in taking control over the material production of the book, but it is irrelevant, even inimical, to the desire to savor the very materiality of highly deliberate language which the carefully made book embodies.

This account of the difference the computer brings to writing would be insufficient if it did not also mention that there is pleasure in it. The pleasure comes partly from the satisfaction of being able to control and use an extremely complex machine—a feeling otherwise denied to most of us. Given our sex-role socialization, this particular satisfaction has so far been mostly the privilege, if it is a privilege, of men. This is decidedly a luxury of the personal computer more than the office computer: do those who are required to sit at the screen all day and perform data entry—most of

whom are women—enjoy it? (While, for example, cold type and hot lead were set by men, most computer typesetting is being done by women.)

One of the pleasures is sheer speed: Olson's pursuit, with the lumbering typewriter carriage, of the speed with which perceptions follow one another in the mind, would have been signally rewarded by the computer. And not only, nor even primarily, in simply recording the desired words as they first come: an electric or electronic typewriter can do this also. It's another order of writerly perceptions that the computer can foster and abet, those of revision and refinement. One can only be grateful for the ability to start a thought six times in succession, refining it rapidly as one goes, without retyping very much; for the ability to leap into the middle of a paragraph or page and add as much as one wants and not retype the rest; to delete anything, instantaneously, and watch the paragraphs perfect their shape again, automatically; to perform the otherwise onerous task of reordering sentences or paragraphs, again nearly instantaneously, by touching a few keys a few times; to format and reformat part or all of a written work (that is, to change it from single-spacing to double, or to narrow the margins or widen them, without retyping anything); to index it without setting pencil to a single index card or ever alphabetizing anything one's self; and so on. The computer can retrieve and reorganize stored information in immensely fruitful ways. It can search one's work for a desired word, number one's pages and footnotes, compose one's bibliography, transport the library card catalog to one's home, and so on.

But just as Olson's use of the typewriter placed essential value on what, for business users of the machine, had been its incidental value (his prizing of expressive flexibility where they prized accuracy, legibility, and speed), there is a radical opposition between the serious writer's use of the computer and the ordinary paperwork world's use of it: the writer seeks the perfection of expression and argument, and the perfection of the finished copy is secondary,

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though not without value. The paperwork world seeks the perfection of the copy and perfectly accurate entering of data, and it accepts, but does not at all seem to require, the perfection of argument or expression.

It happens, too, that what for Olson was the typewriter's most important feature, the exactitude of its placement of typed characters on the page—a kind of musical scoring—is for the computer the most flexible and thus least protected aspect of the written word: what is called the *formatting* of a document. While some word-processing programs include impressive formatting powers —and indeed cannot preserve anything that is not formatted—this very flexibility gives formatting a decorative rather than essential status. The powers of the programs are a twofold response by software creators, not to a desire for exact and minute aspects of formatting that are meaningful, but to procedural necessities and a desire for a merely visual variety and attractiveness in what is printed out. Here image, while it need not oppose the substance of words, at least achieves a status independent of the meaning of words. Contradictorily, the ever more common electronic transmission of text commonly requires that formatting be stripped away to leave a simple string of words. If any illustration were wanting, this will serve to show the computer's relative lack of utility for poetry, whose formatting since the invention of printing has been rigid and must be protected, for it does indeed create a portion of the meaning of the poem. Thus the computer favors by its nature the content of written works, their illustration with image (graph, chart, etc.), and their reduction to easily transmissible form regardless of the specificities of their appearance in any given hard copy or electronic version. This bias may work little loss or hardship on most prose texts, but it clearly diminishes or eliminates the machine's potential as a device that creates artistic possibilities as opposed to reducing them (compare the piano, the synthesizer, the typewriter).

The volatility of the written word housed in the computer, the ready malleability of the written text, and even the repeated loss of the record-in-time of the evolution of a written text, all suggest a connection between the swerving of print culture, or writing culture, toward the computer, and a narrowing of the gap between the written word and the mass image. The mediation of electronic machinery smooths out and removes important differences between the individual writer's labors at his or her work and the creative director's team's universally broadcast images and texts. The computer screen is, after all, technically the same as a television screen, not a piece of paper. I have read of a university dean having said that English departments are museums, that our Shakespeares are in Hollywood, and he said it with enthusiastic approval. I do not think that print culture will ever be dead in the way he wishes it were; indeed, now there is more paper in offices than before computers were introduced. But already it's clear that information of economic importance, when available instantly and over great distances through computers, is in fact far less freely available than printed works. After all, a book or a page requires no electrical current or other connections, weighs little, is cheap to produce, has very efficient RAM, and can be used gratis in the public library.

Such a swerving of print culture also seems to coincide with many things: the vulnerability of journalism, both print and electronic, to contentless but influential images, and to simply too much information; an increase in the number of books that are vapid and obsolescent commodities; the ease of creating false intelligence (disinformation), especially with an aura of technological authority; the control of politics by the techniques of public relations and advertising, with correspondingly vast increases in the cost of running for office, and all too often a rate of success according to the amount spent; the growing proportion of workers in service industries rather than manufacturing; and other notable and troubling changes in our industrialized, televised, heavily

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armed, and computerized society. There is a great and justified clamor among Third World countries that the control of important information flowing from the industrialized countries to all the rest—even, and perhaps especially, information about all the rest of the countries—is an arbitrary, unchecked manipulation of power. This is true both of factual information to which access is limited, and of cultural information, such as television programs whose broadened access is tied to commercial markets for products and whose control of news is effectively a control of public awareness and opinion. The control of financial information is clearly evident in many contexts—such as the influence of computer speed on the newly deregulated London stock exchange or on the Black Monday crash in America in 1987. All these developments have to do with the computer's manipulation of information to be read. Many librarians are aware of the new way in which information is sought more frequently than learning, and they have already warned that access to electronically disseminated information is becoming limited to those who can pay for it (mostly corporations), and cannot be delivered by libraries as a free service to the general public.

Thus is a portion of even the imaginative writer's work at the computer bound up with such vague pervasive influences as world political rhetoric and world economic relationships, for the writer's participation is now in a medium not only of composition but of electronic communication ruled by the economic exigencies of speed and transmissibility. There is, after all, a computer publication named *Infoworld*. The so-called information age, of which writers are a part, leans quite noticeably toward words and figures whose political and economic value is not conclusive but simply up-to-the-minute. Instant assessment by computer of rapid and anonymous telephone polling has come largely to define the tactics, and perhaps even the strategies, of national political candidates, who may thus tailor pronouncements and actions to statistical samples of opinion rather than to elections at which people

registered by name and address cast individual ballots. Polls quite obviously have as much real power as the ballot to influence public policy and government action.

What belongs to yesterday is devalued; speed, convenience, and manipulation of the mass of consumers are values on which technology and American politics converge, even while older or former politicians and historians repeatedly point out the mistakes caused by haste and historical ignorance. Some recent print advertisements for AT&T emphasizing personal computers purport to state a corporate belief that information belongs in the hands of the little guy; yet the power and profitability of the corporation must depend on the very opposite, on a continuous rapid outflanking of such information as the little guy must base his decisions on. If poetry, and by analogy any creation of the imagination such as novels, plays, and essays, is "news that stays news," in Ezra Pound's phrase, then present-day information is in this sense a kind of antipoetry, and the manipulation of information is a kind of antireading and even antithinking. It is this flood, as well as a sense of the enforced insignificance of self in the infonuclear age, that Auden's hopeful young writers were resisting, and continue to resist, however ineffectually.

The informational bias is nowhere more apparent than in a comparison of the preferred vocabulary of two distinct intellectual groups: literary critics and computer programmers and users. Critics are given to speaking of literary works as texts. The term is now neither honorific nor exclusionary; indeed, critical preference for it stems in part from a desire to widen the category of literary work so that the objects of literary-critical study will include many more than those already accepted and preserved as the canonical works. Etymologically *text* comes out of Latin *texere*, "to weave," and this conveys the writer's and the (professional?) reader's sense of a literary work as a thing woven of many strands, perhaps revealing several meanings, appearing to conceal some, and tied by those strands to the culture around it, the history before it, and the future, as well as to other works. The text is thus a complex object

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of scrutiny, a made thing-in-itself, a noun of meaning. The literary-critical term emphasizes the value of a written work.

In contrast, the most common computer-world term for a written text, *document*, emphasizes the use of a written work. Document derives from the Latin word for a lesson, an example, a warning, which in turn derives from *docere*, "to teach." I think the present-day connotations of document are often procedural, if not actually legal, and so the implication available here is that a document is not first of all a thing-in-itself, much less with a complicated historical and cultural existence, but a transparent item that is used. It offers a utility-value and then is needed no longer. Also, a technical writer documents a computer program, writes the documentation for it—which is to say, provides information about it. This is not to disparage utilitarian communication but only to point toward the significant difference in the attitudes of two intellectual groups toward writing. More vividly, perhaps: one can document, but one does not text. If one were to text, this verb would translate as "write a poem," "write a novel," "write a play."

If I were myself perfectly acclimated to the information age, there would be no private record of this piece of writing except the final one: no holographs, no typescripts, no hard copies. But because I am not a wholly naturalized citizen in the realm of the computer, the completion of this piece required me to pass many times through the intermediate stages of printed-out versions and to add to each a variety of afterthoughts and changes in the form of marginal and interlinear scrawlings. Revisions and revisions of revisions, jammed in everywhere, do reassure me of myself: these very sentences were blue scratchings down the right hand margin of the last page of one hard-copy draft.

Whitman wrote in and of his *Leaves of Grass* that who touched the book touched him. But who touches these pages, and most others, these days, touches the work of both person and machine. I wonder if any author is likely to express thanks in a book's

preface to a computer instead of to a person, however indispensable the former. It has forced unwanted changes in my methods, yet I take pleasure in some of its careful, minutely correct ways, even as I wonder about the precise nature of what I am participating in. Serious computer adepts refer disparagingly to computer games as "mind-candy"; that there is an appetite for such sugar is itself a troubling clue to what it is, exactly, that happens when one is sitting at the machine, one's eyes only a few inches from it, in order to write. That's closer than you'd ever want to get to your television, closer than you would want to let it get to you. But that's where I'm sitting, right now, and there I am, on the screen myself, my words, neat and glowing.