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Machine Translation and Global English

I. Introduction: "the cryptographic-translation idea"

A most serious problem, for UNESCO and for the constructive and peaceful future of the planet, is the problem of translation, as it unavoidably affects the communication between peoples. . . . I have wondered if it were unthinkable to design a computer which would translate. Even if it would translate only scientific material (where the semantic difficulties are very notably less), and even if it did produce an inelegant (but intelligible) result, it would seem to me worth while.[1]

When Warren Weaver followed up on this private letter of March 1947 to Norbert Wiener by circulating a memorandum in July 1949 among two hundred leading mathematicians, scientists, linguists, and public policy makers, envisioning in both texts a super-computer that would apply the cryptographic techniques acquired during WWII to all translation—what we can now understand as using codes to decipher codes—he foresaw in principle, and thus materially enabled, the development of machine translation.[2] Out of a clearly stated desire to contribute both to a newly urgent post-war internationalism and to the march of scientific progress, Weaver articulated his vision of computer-automated translation within the biblical paradigm of linguistic division that continues to structure contemporary cultural, literary, and philosophical discourse on translation: the Tower of Babel. A machinic method of coping with the "multiplicity of languages" that "impedes cultural interchange between the peoples of the earth," deters "international understanding," and obstructs the exchange of scientific research would thus be a tower of "Anti-Babel."[3] The tower, though, remains secular, for the proposal to use computers essentially to make all militaristic and scientific material potentially open to the world, thereby facilitating necessarily peaceful international relations is "not intended to reach to Heaven. But it is hoped that it will build part of the way back to that mythical situation of simplicity and power when men could communicate freely together, and when this contributed so notably to their effectiveness."[4] Weaver's hope, then, was that machine translation—inputting a text from a source language and outputting the same text in a target language, with the basic meaning preserved—would make multilingual texts available and easily accessible to researchers.[5] This suggestion of instant access to flexible data

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places Weaver's vision in line with Vannevar Bush's coterminous vision of the desktop Memex system that would put accumulated knowledge instantly at hand.[6]

The idea of a computer that can understand natural language and thus listen and talk to anyone in real time continues to wield a certain cultural power. Futurist visions of machine translation are, on the one hand, within the scope of science fiction, exemplified by such fictional devices as Douglas Adams's portable automatic translation machine, the "Babel fish."[7] But, in the tradition of Vannevar Bush–era Department of Defense and corporate research, machine translation also continues to be associated with governmental, economic, and military interests, as it was in President Clinton's State of the Union Address (2000): "Soon, researchers will bring us devices that can translate foreign languages as fast as you can speak."[8] While still within the realm of speculation, Clinton's comment encapsulates the split between what is essentially a matter of theory, realizing the mid-twentieth-century vision of a fully automated and high quality machine translation (FAHQMT), and pragmatic enterprise on a smaller and less ambitious scale.[9] Weaver noted even from the outset that "'perfect' translation is almost surely unattainable," foreseeing that a true translating machine would require artificial intelligence and the ability of the computer to comprehend not just vocabulary and syntax, but also rhetoric and context.[10] What exactly constitutes a "perfect" translation, or even accuracy, quality, and meaning, continues to be contested, and there are no definitive answers, either theoretical or practical. Regardless, within the last decade, machine translation has evolved as a significant commercial venture, combining the research of computational linguistics, logical philosophy, and computer science (although work within the computer sciences has primarily shifted over to voice recognition and transcription technologies).[11]

At this point, however, the critical humanities need to intervene, and bring contemporary critical thought about translation, cross-cultural communication, and transnational literary studies to bear on the issue, particularly since we face a possible future when automated translation might very well function in a basic manner for all discourse, including the literary. Despite the fact that no real work is being done to apply machine translation to literary texts, it is already the case that one can run Dante through the *translate now* function on Google or the Babelfish program connected to AltaVista and produce a basic, if inaccurate and strangely fractured, translation. Even as a simple means for rough translation of a source original text, the ubiquitous, yet still-emergent, practice of machine translation requires us to consider both its effects on language and its consequences for our evaluative appraisal of language. Further, its functionalist logic requires us to ask how we have come to view the value of language at all: in terms of basic, com-

municative meaning, or in terms of ambiguity and complexity in the ordinary sense. Does machine translation constitute a new linguistic utilitarianism, in other words, or is it just an extension of the functionalist cultural logic of Global English? Insofar as machine translation really only works to produce reasonably accurate and functional draft translations when the input is basic, and when both input and output are restricted with respect to style, vocabulary, figurative expression, and content, we are presented with a renewed utilitarianism; a renewed appreciation for the basic and easily translatable (the non-figurative, the non-literary); and a new economics and pragmatics of language and informatic exchange.

Machine translation does not present us with a new theory of translation in the context of globalization, but rather with a further dimension and renewed rationale for it: that of functionality and performativity. Machine translation brings to our attention in a materially significant manner the ideal of a perfect and fully automated translation from one natural language to another, with both languages considered as neutral and emphasis falling on the process, accuracy, and functionality of the exchange. In our current moment, total translatability and equivalence would mean a database with universal data input-output capacity, specifically for multilingual translation, and without the use of a pivot language like English. (Research into universal data—data that is stable and consistent across different platforms and technologies—is one current incarnation of this vision of universality and transparency.)[12] In that machine translation tries to posit a kind of universality and transparency to translation that has come under critique by theorists such as Lawrence Venuti, Gayatri Spivak, and Lydia Liu, the two discourses need to be linked so that machine translation research can come to terms with contemporary theories of the politics, philosophical basis, and cultural specificity of translation practices.[13]

The issues translation criticism has engaged—the whole body of work on the subject in philosophical, historical, and cultural analysis—are still relevant and necessarily present in this new technological moment. For example, machine translation assumes a fixed position for target and host languages, but as Venuti has argued, the complexity of translation practice in a global context requires our recognizing that "domestic" and "foreign" are shifting, variable, and mutually constitutive categories.[14] Machine translation research also tends to suppose that linguistic knowledge (grammatical rules, idioms)—as opposed to the extra-linguistic—is the basis for all translations, which places it at odds with Spivak's articulation of the critical and ethical pitfalls of privileging grammar over rhetoric. Without listening to the rhetoricity of the language of the Other, which involves an erotics of submission, she argues, one simply imposes a grammatical structure onto the text and effaces its voice and singularity. Following Spivak's

critique of the ethnocentricity and "law of the strongest" that compels the translation of non-European texts into a "with-it translatese," Venuti has also called for a translation ethics of difference, a respect for "the foreignness of the foreign text," rather than an "ethics of sameness that hews to dominant domestic values," domesticating the foreign within state, or standard, language.[15] Liu has similarly theorized translation in terms of cultural contest: "translation is no longer a neutral event untouched by the contending interests of political and ideological struggles. Instead, it becomes the very site of such struggles where the guest language is forced to encounter the host language, where the irreducible differences between them are fought out, authorities invoked or challenged, ambiguities dissolved or created, and so forth."[16] But in the instance of machine translation, the site of struggle is primarily a site of resolution, of circumventing or smoothing over linguistic difference. Its illusion, as Lisa Parks notes, is "a sense of linguistic liquidity, allowing users to seamlessly permeate language barriers and access forms of cultural consciousness that were previously inaccessible."[17] Ambiguities are created in the movement from one language to another, certainly, but the rationale of machine translation is to send a signal with a clear, decipherable message. It follows, then, that the primary discursive sites for machine translation are the weather, finance, and the news, all of which affect neutrality and require only a functionally basic semantic accuracy.

This is not, however, an essay about the state of the art of machine translation at the end of the twentieth century: it does not aim to give a technical explanation of its procedural intricacies, nor does it explain or evaluate any particular translation system or any particular instance of government sponsorship in detail.[18] Further, this essay will not move into the field of computational linguistics and delve into the differences among a direct, transfer, or interlingual approach to machine translation, differences which have been elaborately detailed in works by Jonathan Slocum, Sergei Nirenburg, Martin Kay, and others working in the field.[19] Rather, this essay considers the relationship between machine translation and Global English and argues for a homology between the rationale of the former and that of the latter. Because machine translation draws our attention to the interrelation of machine languages and natural languages in the context of the global information society, we can more easily identify some of the cultural-linguistic effects of these relations: the emergence of hybrid forms of language, born of the intermixing of natural language and computer code in experimental writing, art, and online communication; the controlling and partial excision of the rhetorical element of language; and the privileging of logic and semantics within a "Basic English."[20]

It is not for nothing, then, that Warren Weaver should specifically link his proposal for machine translation to C. K. Ogden and I. A.

Richards' Basic English project, which endeavored to institute a simplified version of the English language as a benign and neutral means of international communication.[21] Basic was engineered to be more economically sound and efficient than "normal" English, and it provided an institutional basis for thinking of the English language as a utilitarian, minimalist, and economically sound system that insured efficiency and precision and attempted to minimize the messy ambiguities of signification. In Weaver's letters and memo, Basic English is articulated as an analogue for machine translation: "Such a program involves a presumably tremendous amount of work in the logical structure of languages before one would be ready for any mechanization. This must be very closely related to what Ogden and Richards have already done for English—and perhaps for French and Chinese."[22] The analogy between the two is both literally and conceptually articulated in Weaver's proposal. Both are thought in terms of functionality, universalism, and a fundamental dichotomy between basic meaning and instrumental communicative action, on the one hand, and the poetic, literary, or figurative, on the other.

Somewhat in the manner of Ogden's and Richards's development and promotion of Basic English, research into machine translation has historically arisen in partial response to international military conflicts. For example, an IBM demo in 1954 of a Russian-English program with a 250-word vocabulary generated quite a bit of excitement and funding and paralleled other military and intelligence plans for the development of "mechanized systems" to facilitate the use of as much international technological and scientific research as possible.[23] In this respect, machine translation has a specific cultural history, tied to postwar internationalism, Cold War-era anxieties, and militaristic conflict. The plausibility and rationale of Weaver's vision of outsourcing translation to the computer stems from cryptography, and specifically from his idea that the techniques used for decoding Nazi messages could be brought to bear on the development of machine translation. He called this his "cryptographic-translation idea" in his letter to Norbert Wiener in March 1947:

> Also knowing nothing official about, but having guessed and inferred considerable about, powerful new mechanized methods in cryptography—methods which I believe succeed even when one does not know what language has been coded—one naturally wonders if the problem of translation could conceivably be treated as a problem in cryptography. When I look at an article in Russian, I say: "This is really written in English, but it has been coded in some strange symbols. I will now proceed to decode."[24]

The "cryptographic-translation idea"—which was to become the axiomatic principle for the development of machine translation—holds that "foreign" languages, in this case Russian, are to be regarded as codes to be unencrypted. Simply crack the enigmatic code by ma-

chinic means, Weaver suggests, and the message will be revealed, unchanged, in English. Radically diverging, both theoretically and practically, from linguistic, philosophical, and cultural theories of translation, Weaver makes the same point later in the memo:

> as was expressed in W. W.'s original letter to Wiener, it is very tempting to say that a book written in Chinese is simply a book written in English which was coded into the "Chinese code." If we have useful methods for solving almost any cryptographic problem, may it not be that with proper interpretation we already have useful methods for translation?[25]

If it were only possible to unpack the mysterious code, Weaver suggests, it would be possible to retrieve the information stored in the text.[26] No linguistic or even symbolic relationship between the two languages is offered; instead the presumed relations are morphological and conceptual, with English offered as the master, universal, über language. The idea that all texts written in "foreign" languages are actually written in English, simply encoded in strange and undecipherable symbols, finds a strange, and strangely analogous, articulation in a 1937 Popeye cartoon.[27]

During the course of the animated feature, "Popeye the Sailor Meets Ali Baba and the Forty Thieves," Popeye and Olive Oyl stop in to a cafe for food while they are on the run from the thieves. Popeye is handed a menu with illegible scratches and scrawls made to approximate a language with a non-phonetic script with vague hieroglyphic elements, a script that signifies the idea of difference rather than referring specifically to an existing language. Upon being handed the menu, Popeye responds, "I can read readin' but I can't read writin'." He folds up the menu from the corners in an origami-like fashion, after which the markings on the paper are arranged into English words and read:

Bacon and Eggs
45¢

The riddle, and even moral, of the menu is as follows: all Other languages derive from English as the common source and the master key to all linguistic mythologies. Any semantic puzzle ultimately can be reconfigured so as to render the alien script as the familiar and civilized voice. As English is fashioned as the master code and origin of all other languages, the common source is instead *the* source—the winding and almost indiscernible path of etymological history leads ultimately back "home," to English, of which all other languages exist merely as altered, debased, and inferior versions. To use the terms of the menu itself, they are English, but scrambled. In a curious formulation that almost constitutes a reversal of primitivist skepticism, the "foreign" character is writing but it is not reading. It is also thematically linked with other instances of puzzle solving—the rubbing of

the lamp and the revelation of the password "Open Sesame"—and so constitutes yet another rewriting of the *Arabian Nights*. What, then, do both Weaver's remarks about Russian or "Chinese code" and this caricatured representation of English in the midst of a field of linguistic others tell us about the status of non-European scripts, the fears of incomprehensible alterity, and the inherited mythology of English?

They tell us most obviously that non-European languages are mystifying codes that need to be cracked in order to achieve any degree of communicability, and, unlike the lamp or the password, the menu offers a parable of a subject that distinctly refuses to operate within the structures of a "foreign" code. Popeye, after all, does not learn this code, but instead makes it over into English, which renders the non-European character as an incomprehensible screen that needs to be torn aside in order to access a set of signifiers that will in turn produce meaning. Such a gesture requires a belief in a universal signified, as Alan Melby notes of Weaver's own gesture toward ripping away the screen of foreign code: "he was suggesting that a text in a human language is the result of encoding the message behind the text. The message is the same for all languages; only the encoding system differs."[28] Further, these particular representations of English serve as a reminder of the structure of difference and the constitution of value, whereby the appreciation of the western emerges in relation to the debasement of the Other. Thus has it been the case, then, that the celebration of the power of English has historically been made possible in part by the denigration and suppression of non-Roman scripts, of minor languages, of other languages with imperialistic force (e.g., French, Hindi, Bengali), and of the hundreds of dialects in use. Specifically, it has also been made possible by the privileging of the phonetic script over the pictorial, that is, by the suppression of the foreign character as not-linguistic and as not-writing. To cite Jacques Derrida's "The Violence of the Letter," it was "legitimate not to call by the name of writing those 'few dots' and 'zigzags'" precisely because it was the province of writing that was bracketed off, protected, and claimed for the west.[29]

Weaver's inclusion of his original letter to Norbert Wiener within the memo situates his visionary proposal of machine translation within the context of informatics and cybernetics. So, too, does Weaver's coterminous and institutionally aligned work with Claude Shannon on *The Mathematical Theory of Communication* suggest a relationship between machine translation and information theory: how to consider untranslated characters, after all, but as dots and zigzags, not writing?[30] And as mere noise that impedes intelligibility and the transmission of content and therefore needs to be converted to legible signals? His proposal with regard to "Chinese code," however, was not at core a suggestion that English was the underlying foundation of all language. Rather, his proposal was based on the belief in a kind of

common source, or what he termed, "the real but as yet undiscovered universal language," confused and obscured by the tower of Babel:

> Thus may it be true that the way to translate from Chinese to Arabic, or from Russian to Portuguese, is not to attempt the direct route, shouting from tower to tower. Perhaps the way is to descend, from each language, down to the common base of human communication—the real but as yet undiscovered universal language—and then re-emerge by whatever particular route is convenient.[31]

While the screen code of each language may well be presented as a logical and statistically regular, though complex, puzzle for the present and for the foreseeable future, he imagines a "real" universal language at the base of all language, the decoding of which was projected into the distant and virtually unimaginable future. Much as in Plato's *Cratylus* and Walter Benjamin's essay on translation, there are two views of language considered here: functional and mystical. While the more direct route for machine translation—from natural language to natural language—was the more immediately pragmatic and instrumentalist, it was the more mystical route down from the tower to the subterranean, cognitive, authentic language that Weaver offered as both "true" and efficient.

Contemporary artistic and conceptual commentary on Weaver's rationale for machine translation can be found in Warren Sack and Sawad Brooks's Internet-based *Translation Map*, which critiques Weaver's notion of translation-as-decoding, and explores an alternative: translation-as-collaboration.[32] For too long, Sack and Brooks suggest, has Weaver's axiom held sway over the development of machine translation. Their intervention is "a computer program that can help connect people together over the Internet facilitating a collaborative re-writing process."[33] Instead of the interface common to Babelfish and related translation programs, which offers a direct and strictly machinic link between, for example, text in English and French, *Translation Map* maintains Weaver's rhetoric of the "route" and uses an algorithm to look for a path from home country to receiver country, through a country that has both languages in common. A direct route from English to French would thus proceed from England to Canada to France, and, if a direct route were not available, the algorithm would find a mediating language, so moving from English to Luba-Kusai would take one through Egypt in order to arrive in the Congo. In this respect, the project provides a visual map of the dislocated movement from one language to another and strives to preserve opacity and difference rather than transparency and sameness. Instead of ceding the task of translation strictly to the computer, *Translation Map* relies on participants in online forums such as newsgroups to assist with the various translations along the route chosen by the user. Related to Sack's critical and artistic investment in the information ar-

chitecture of discourse networks, *Translation Map* literalizes the idea of speaking, moving, and gaining proximity, to the Other.[34] While it is more of a theoretical than a practical intervention into the problem of machine translation, the *Translation Map* project nevertheless makes a striking contribution to the discourse in its emphasis on cross-cultural exchange, human-machine collaboration, ethno-linguistics, multilingualism, and a global space that is not dominated by English.

II. Electronic English

Programming languages have eroded the monopoly of ordinary language and grown into a new hierarchy of their own.[35]

The increasing ubiquity of buttons and icons that direct the user to *translate now* raises an important question with respect to the futures of English in an age of technological communication.[36] Are we going to be (or even are we now) presented with an all-English Internet or one dominated by Multilingual Webmasters, machine translation, and character encoding sets such as Unicode™, to the extent that different characters and different language structures clash and intermingle without producing a dominant linguistic order?[37] In other words, do the global circuits of media, commerce, and technology promise monolingualism or radical heteroglossia? Will the contemporary story of English be one of imposition or fragmentation? Will it be a neo-imperial English or Englishes that are broken and radically multiple, promising variation and individuality as partial effects of language technologies such as machine translation?[38] With this series of questions we have, essentially, a dialectic between the imagined uniform futures of language (with Global English as a precursor) and the radical individualization of information that "pull" technology will promise, a vision of extreme tailoring and adaptation.

One view of English in a moment of electronic empire holds that the language constitutes a new empire, one severed from territorial, national, regional regimes of power, but irrevocably linked to the structures of capital. The template critical narrative, exemplified by Joe Lockard in a *Bad Subjects* column, is that English is solidifying its power via cyber-English, which is more global, quantitatively and qualitatively more powerful than previous forms; that cyber-English is consolidating its power in light of "less common" languages; and that economic structures of power are replicated in the linguistic.[39] What is being lamented in such a critical account, as an illustrative example, is the suppression and even loss of local, minor languages in the face of an impending cyber-English, the ceding of the polyphony of language difference to the univocal. There is an immediate aurality and visibility of this process of becoming-major, illustratable in one in-

stance through a sampling of the European Radio Network and its EuroMax English program.[40]

There is another dimension to this question of linguistic power and domination. It has not been necessary in the context of this essay to review the differences between those machine translation programs that are hardware-intensive (e.g., Logos and Systran) and those that are designed for use on an individual computer (e.g., Globalink, which comes with translation utilities for Internet communications).[41] Rather, in order to discuss broader issues of language and culture that arise in relation to the practice of machine translation, I have assumed a general equivalence and for the most part bracketed the question of quantitative difference between the two. However, one difference of qualitative significance is that the individual or home systems are primarily based in English and work exclusively with a handful of European languages.[42] Although machine translation partly arises as a response to monolingualism and promises to preserve local or minor languages, it primarily operates around and with English as a pivot language; as the dominant language for computational linguistic and engineering research; and as the basis for assembly, low-level, and high-level programming languages. While English functions as the dominant source and target language in most bidirectional machine translation systems, Russian is at the center for some, and the additional presence of much translation work on Chinese and Japanese helps to constitute an axis of linguistic-geopolitical power in the late twentieth century.

As a counter-narrative, however, it is important to keep in mind that language politics are not the same everywhere and that a global theory of language domination is not really possible, particularly when EuroMax is counter-balanced by EuroMix. Translation technologies, encompassing translation memory (TM), which is the storage of multilingual versions of the original content, and machine translation, algorithmic, on-the-fly transmissions, must always introduce a bit of uncertainty and multiplicity into the system and complicate the vision of a monolingual Internet. So, while even the briefest surf through Web sites around the world can confirm that "Global English" is not just a flight of fancy but in fact has a material basis, and it would thus appear that we are presented with the monologism and "anglophone triumphalism" that are named as features of a "cyber-English paradigm," we are nevertheless still in a moment in which linguistic subcultures can and do operate against the grain.[43] It is possible to seek out both global broadcasting of local languages, e.g., Radio Prague, and numerous cultural-linguistic web rings that are quite comfortably centered in local languages that can themselves have a global reach, e.g., a network of Russian émigrés, all of whom are linked through a central server based in Moscow. There are also networks attuned to

non-nationalist pan-European interests, such as the European Council's investment in building up a multi-lingual, regional information and communication infrastructure.[44] Major search engines such as AltaVista have European mirrors with multiple language options and are monitored by such publications as Internet Operator Europe.[45] There are significant individual projects as well, such as Odd de Presno's "Your electronic daily news," which addresses the subject of language use on the Internet and assures browsers that there are alternatives to English (it is published online in English, German, and Norwegian).[46] Moreover, in many communication networks linked through central servers based outside the territorial limits of the Anglophone world, English is present in the network of pages only through those basic international words such as radio, TV, video, computer, and DVD.

Not only is English "Basic" in networked media, but it is often, to use the operative term from chat rooms, bulletin boards, and web rings, broken.[47] Marked by a convergence of a myriad of native and non-native forms of English, broken English is by no means exclusively European. Broken English is not regional and not really culturally elite, which is to say that it is not the province of the "new class" of the global technological intelligentsia alone. Its territory, rather, is the network. There are historical and socio-cultural consequences of this passage from regionalism to globalism, however. As the artist Rainer Ganahl notes, the severing of the exclusive and necessary link between language and geophysical space, the making of English into a mobile, "transit language," comes at a loss for "collective memory, of an identity that is somehow constituted through a common language and shared history."[48] If we can allow for a stable referent, this non-territorial language is also named by McKenzie Wark as "netlish," a mode, and nodal site, of writing that emerges "without being passed through a single editorial standard."[49] Such a staging of different and imbricated language practices—with all idioms competing for status, primacy, and privilege and with every word and phrase subject to rival pronunciations, social accents, and inflections—illustrates the linguistic struggles and conflicts inherent to heteroglossia itself. The Global English network, then, essentially encompasses innumerable networks, matrices of speech, communicative, and language practices, and it strongly resonates with our prior critical understandings not just of the dialogic, but of intertextuality (Julia Kristeva and Roland Barthes), signifyin(g) (Henry Louis Gates, Jr.), and tactics (Michel de Certeau). This network cannot be understood, in other words, without considering the dynamics of appropriation, adaptation, and inhabitation.

Basic English, or, a basic English vernacular dialect (also called "generic," "plain," and "world" English within cultural criticism, lin-

guistics, and the discourse of governmental and political policy) literally informs the Simplified and Controlled English systems as they are used in machine translation. The many machine translation systems share a few foundational principles: the language in use should ideally limit vocabulary choices (often to specialized lists designed for particular transactions), prohibit the figurative and rely on literal uses of language, restrict words to one meaning and one part of speech, and depend upon a codified set of rules for syntactical formulations.[50] For these reasons, machine translation was from the beginning imagined and developed for technical, rather than literary use, for documents in which rhetoric, style, and figuration are unnecessary and even undesirable.[51] As Weaver notes in his proposal for a tower of "Anti-Babel":

> A few stories above ground would not afford, from this new tower, a dramatic far view of great aesthetic value, but it could be very useful for loading trucks with informative content. This, in fact, is the reasonable purpose of this effort. Not to charm or delight, not to contribute to elegance or beauty; but to be of wide service in the work-a-day task of making available the essential content of documents in languages which are foreign to the reader.[52]

From its visionary inception, then, the rationale behind machine translation has depended on a dichotomy between the useful (to "be of wide service") and the affective (to "charm and delight"), the basic and the poetic, the literal and the figurative, the functional and the aesthetic. Further, machine translation has been conceived in terms of technicality, use value, the informative, and the ideal of direct communication, as Weaver noted from the outset: "No reasonable person thinks that a machine translation can ever achieve elegance and style. Pushkin need not shudder."[53] As an interesting counter-point, the digital critic Julian Dibbell experimented with the poetic capabilities of Babelfish and likened its output, "random acts of senseless beauty," to Dadaism, surrealism, and the cut-up.[54] In practical terms, however, the rationale articulated by Weaver has meant that the discursive application of machine translation has historically been weather reports, legal documents, and informative instructions. And indeed it is the case that an argument for an ontological differentiation between programming languages and natural languages—based on the notion that programming languages are only capable of instructions and incapable of figuration, generating affect, and embodying other historical properties of the literary—still predominates in machine translation research.

To suggest a link between Basic English and a mechanized English is not to speak of a philosophical relation between language and technology but of a practical and cultural-historical relation, to note that commonly cited effects of computers on language practices include abbreviated and simplified syntactic forms.[55] The United Nations University's Universal Networking Language Programme (an Internet-based software system), for example, supports translation among sev-

enteen languages by converting and deconverting documents into an electronic language structured according to the relations among basic nominal, verbal, adjectival, and adverbial concepts.[56] Indeed, Computer-Mediated Communication, as it is termed, is also structured according to certain formal features that emphasize abbreviation, a minimalism of expression, and the basic taxonomic unit of information, such as the list and the short paragraph. More broadly, the globally dominant language now, as the recent VeriSign dispute over the use of Chinese characters in web addresses attests, is a minimalist code that encompasses such practices as the translation of "foreign" characters into numerical code, the use of emoticons, and the use of abbreviations (CMC, IMHO, BTW, AFAIK, IP, TM, AOL, ASCII, WYSIWYG).[57] That the basic or simplified form of English, featuring imperative verbs in particular, should function as the necessary precondition to the global network of computer and programming languages, which in turn maintain a parallel function and currency, is noted by Friedrich Kittler as already an inevitability:

> Johannes Lohmann, the renowned language scholar and Indo-Germanist, already proposed thirty years ago that one look for the historical condition of possibility of programming languages in the simple fact that they exist in English, and furthermore that they exist only in English verbs such as "Read" and "Write," that is, verbs which in distinction to the Latin *amo amas amat* and so forth have shed all conjugation forms. According to Lohmann, these context-free word blocks may well stem from the historically unique confusion of Norman and Saxon in old England, but that is no hindrance to their being translated into context-free mnemonics and ultimately into computer op-code.[58]

For the software and tech industry, Global English is at times considered to be synonymous with "simplified or controlled English" and likewise presumed to be universally accessible and comprehensible. These qualities enable the literal consideration of Global English (along with French, North American English, Spanish, and German) as a separate language for application and server software such as WinFrame 1.7 and Lotus's SmartSuite Editions™.[59] Global English, for the software and tech industry and the academy alike, is at once encoding language, linguistic standard, and educative mechanism.[60] While the tech market falters on the whole, and in yet another instantiation of the new old economy, the English language sector of this market thrives. This market is currently estimated to exceed $15 billion, with the global English Language Training (ELT) market, including ELT publishing, ESL programs, English-language publishers, and all-purpose "global providers of lifelong learning information," is estimated around $300 million.[61] Administering the linguistic laws and theoretical norms of Global English now requires such tools as the AOL-partnered Lernout & Hauspie's Intelligent Content Management (ICM) suite of language technologies, which includes CorrectEn-

glish™ and International ProofReader™, both of which correct spelling, grammar, and punctuation errors commonly made by EFL and ESL speakers.[62] As a strenuous test of the Bourdieuan analysis of the decisive role that the educational system plays in the construction, legitimation, and management of official languages, providers of lifelong learning information such as Thomson Learning are expanding their international infrastructures and investing heavily in the ELT product market.[63] Consequentially, Global English can be symbolically marketed as "an exciting, new, British Multi-media educational product" by Systems Integrated Research and by Learnz Corporation as the language virtually guaranteed to grant access to both Asian and Internet markets.[64] The supplementary concept for Bourdieu's delineation of the adjudication and regulation of linguistic law by grammarians and teachers must be "Protocol" (as in TCP/IP)—in other words, standards for the transmission of data based on use.

Standards, whether for character encoding or universal languages of software development, allow for maximal translatability and commensurability among natural languages, machine languages, and programs alike. And, because messages must necessarily become numbers before they can reach the targeted recipient, translatability and reproducibility are at the very heart of the language problem for digital technologies now, as they were for Claude Shannon's articulation of a mathematical theory of communication in the mid-twentieth century. Shannon's statement of the fundamental problem of communication remains current: it is "that of reproducing at one point either exactly or approximately a message selected at another point."[65] So it is that such character encoding standards as ASCII would come to be depreciated on the basis of their frequent failure to reproduce, in this particular instance because ASCII cannot allow for languages other than the Roman alphabet and it thereby maintains an inherent ethnocentric bias.[66] A much more extensive range of character encoding is allowable with email program extensions such as MIME, and there are now tools such as IntelliScope(R) Language Recognizer, which identifies more than forty languages and codes, including HTML and XML formats.[67] But the major development in the area of universal standards is Unicode, a worldwide character standard "designed to support the interchange, processing, and display" of textual data in almost all of the world's languages by assigning a unique number to every character, including over 28,000 ideographic characters.[68] By using unique numbers, Unicode eliminates the variation between other encoding systems and comes closer to achieving global status than any other language or encoding system that I know. Hence, its slogan: "When the world wants to talk, it speaks Unicode."[69] Such a reach as Unicode achieves and such a facility as it maintains can only be attempted by Global English.

To reduce the chance of misfire, to eliminate noise, a networked Global English must necessarily be universally readable, particularly by machines. The context of late twentieth-century iconic or visual communication is apropos here, placing as it does a premium on images that are literally representational, transparent, and universally decodable. Even the non-representational, mystificatory, cryptic, and abstract are counter-balanced by a readability, by an absorption into a networked system in which, in a conventional sense of signification, they do not need to mean but function, with and for global capital. If we depart from the practical and functional perspective on programming languages in order to consider iconic or visual communication in aesthetic terms, a certain play on the aesthetics of the code and the aesthetics of programming languages does become available.[70] The most complex and widespread programming languages such as COBOL, BASIC, FORTRAN, and ALGOL have acronymic names, professional signatures, in and of themselves.[71] But these professional signatures do not entirely matter; the signatures, in fact, communicate something else. Like the @ and Nike symbols, they are transferred into the realm of advertising and thereby become iconic. In other words, the names of the languages play beyond their formal content to an iconic, transactional register. Combining as it does commerce and the iconic, such a register allows for a power that is as manifest as it is abstract.

Computer languages, operative and performative languages that allow computers to function and connect to each other, and presumably context- and value-free when they are at their premium, do approximate and augment natural language in their reliance on injunctive commands such as *read*, *write*, and *perform*.[72] They are further linked to Global English by a common investment in universality, neutrality, and transmittability.[73] Their transmissible aspects—the means and mechanism of their spread—are homologous. They share, further, a tendency toward what Kittler names as "monopoly" and "hierarchy." He notes:

> Programming languages have eroded the monopoly of ordinary language and grown into a new hierarchy of their own. This postmodern Tower of Babel reaches from simple operation codes whose linguistic extension is still a hardware configuration, passing through an assembler whose extension is this very opcode, up to high-level programming languages whose extension is that very assembler.[74]

A numerical character encoder or a microcode, the lowest and most basic level of instructions for directing a microprocessor to perform, essentially allows that tower to stand, or, in this case, run. As English becomes computer languages, as it moves into new codes, and becomes in a sense post-English, it both transforms itself and reveals in different guise its instrumental, functional, performative aspects.[75] What allows English to spread in such a particular way, then, is its functionality.

Because the global communicational apparatus insists on a basic legibility for its transmissions, functionality and performativity are the premium values of language technologies and translation systems. Jean-François Lyotard has commented on the ideology of "communicational 'transparency'" in the context of the post-industrial, telematic, and postmodern society.[76] This ideology of transparency, for Lyotard, links social progress and the development of knowledge to the unimpeded and instantaneous circulation of messages. For the commercialization and exteriorization of knowledge, communicability is thus not only demanded but fundamentally required. Borrowing the rhetoric of signal and noise from information theory, Lyotard asserts that the technocratic values of efficiency, productivity, and performativity go hand in hand with the transmission of easily decodable messages.[77] This, then, is how we can understand translatability as an educative value, and more concretely, how we can understand the institutional insistence on the value of writing across the curriculum. The insistence on utility has meant that literary and language departments have turned to their most obviously quantifiable mode of instruction and research: composition and literacy. That the notion of literacy requires further revisiting as we consider the relations between reading practices and digital textuality, or the technological substrate of the text, can be illustrated by a link between the mechanized code of machine languages and an updated pasigraphy.[78] Both are artificial universal systems of writing that use a combination of characters and numbers and that are meant to be universally comprehended. But the difference is that achieving an immediate and easy translation between two different languages no longer requires a knowledge of an intermediary language (such as the characters in a universal alphabet). The user in this sense is removed from the high-caste, seemingly rarefied mediating system, which is now the province of a new technical class.[79] Armand Mattelart's importance for this line of argument lies in his highlighting of the utilitarian aspects of communications research and its new technological tools: "This is true as well for intellectuals, who are more and more in the grip of managerial positivism, a new utilitarianism that stimulates the search for epistemological tools capable of circumscribing the potential zones of conflict and diminishing tensions through technical solutions."[80]

In *The Power of Identity*, the second volume of his trilogy on the Information Age, Manuel Castells asks a basic and yet pivotal question with respect to Catalan identity: Why is language so important? After considering several answers, he turns to "an additional and more fundamental answer," which resonates strongly for my own questions concerning the conditions of possibility for Global English. Castells's "fundamental answer" may be "linked to what language represents, as a system of codes, crystallizing historically a cultural configuration that

allows for symbolic sharing without worshipping of icons other than those emerging in everyday life's communication."[81] Because "going digital" ultimately means translation into a basic, common, putatively neutral medium for communicating information on a global scale, codes and iconic images are our new universal languages of transaction.[82] These transactional codes are not just binary in composition, but they are all, whether character encoding system, stock market symbols, pager codes, or even iris codes, machine-readable and machine-producible. One point of entry into this problem for me involves institutional modes of value: in other words, what literary and language departments are to do about the hegemony of English, however minimalist, and about the hegemony of codes, not, as Unicode advertising would have it, something to speak, and not, as Ellen Ullman says, "a text for an academic to read."[83] At least one answer would have to be that we come to consider codes to be, as Kittler notes, "subject to the same opacity as everyday languages."[84] What is to be resisted, then, is the insistence on immediate and basic legibility. And while I have no stake in legitimating complexity at the expense of simplicity and minimalism, I would argue for the need for the "appreciation" of the idea of the tower of programming languages (from machine language up to fourth-generation programming languages), since such a layering not only allows for, but fundamentally requires, variation.

As the status and legitimation of knowledge are continually reengineered, it follows that the global business of language would fundamentally change. The field of machine translation no longer truly debates the question of what constitutes a perfect, totally automated, or even high-quality translation. The issue, rather, is functionality; that is, whether the machine translation system can produce automated output that is sufficiently usable, without human intervention, while still remaining cost-effective and facilitating global financial trade.[85] Both Global English and machine translation abide by the principle of instrumental rationality and exist in the technocratic mode, as Daniel Bell outlines it, whereby "the ends have become simply efficiency and output."[86] Both operate in the mode "of production, of program, of 'getting things done.'"[87] With Global English as a precursor network and medium of late twentieth-century communication, computer languages maintain a parallel currency and legitimation. Like the reorganization of the oil industry after the influx of digital technologies, the old economy of English studies has itself been made new as the market focus for corporations, governments, and schools alike has shifted to functionality and efficiency, and specifically to the means by which information is retrieved, exchanged, and transmitted. Lyotard has explained how the nature of knowledge has fundamentally changed and how the relevance and value of research will increasingly become a matter of translatability into the computer banks: "We can

predict that anything in the constituted body of knowledge that is not translatable in this way will be abandoned and that the direction of new research will be dictated by the possibility of its eventual results being translatable into computer language."[88] English has been able to survive the fundamental changes that have resulted from a reorganization of knowledge and information, then, precisely because it has been amenable to processing as information and to interfusion with informatic codes.

Language technologies are already a significant growth industry, and the market for advanced machine translation programs continues to expand, but this industry's constant and rapid transformation, its unpredictability, and the unpredictability of its consumers, virtually guarantee that contingency will have a great deal to do with the outcomes and futures of English, even in its current operative incarnation. We cannot say with any degree of certainty what the literal and precise order of language would be were the vision of immediate and universal translation realized, except to speak about its becoming-code, its functioning as a code. Neither the narrative of imposition nor the narrative of radical multiplicity and fragmentation can stand. Instead we have to consider language in this context, and specifically the English language, as a basic neutral code operative and operable as a virus, insinuating itself into various networks, with the hosts accepting, not rejecting, the transmission. This is code-switching of a different order.

Notes

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1 Warren Weaver, "Translation," in *Machine Translation of Languages: Fourteen Essays,* ed. W. N. Locke and A. D. Booth (Cambridge: MIT Press, 1955), 18.

2 For a historical overview of the early stages of the research and development of machine translation (hereafter "MT"), see Alan K. Melby, with C. Terry Warner, *The Possibility of Language: A Discussion of the Nature of Language, with Implications for Human and Machine Translation* (Amsterdam: John Benjamins Publishing Company, 1995); W. John Hutchins, *Early Years in Machine Translation: Memoirs and Biographies of Pioneers* (Amsterdam: John Benjamins Publishing Company, 2000), especially the introduction; Bozena Henisz-Dostert, R. Ross Macdonald, and Michael Zarechnak, *Machine Translation* (The Hague: Mouton Publishers, 1979); and B. Buchmann, "Early Years of Machine Translation," *Machine Translation Today: The State of the Art*, ed. Margaret King (Edinburgh: Edinburgh University Press, 1987), 3–21.

3 Weaver, "Translation," 15.

4 Locke and Booth, vii.

5 One of the dominant terms in the field of machine translation is "transfer": the middle stage when the representation of the source language is mapped onto the representation of the target language. Transfer in the context of MT is to parse the source, discern and apply syntactic and grammatical rules, and then produce a target output, also according to these same rules. It proceeds like this: analysis → transfer → generation (input string → source language → target language → output string).

6 See James M. Nyce and Paul Kahn, eds., *From Memex to Hypertext: Vannevar Bush and the Mind's Machine* (London: Academic Press Ltd., 1991).

7 As a testament to the possibility of converting fiction into concrete instrument, Douglas Adams's translation machine, the "Babel fish," lends its name to Systran's AltaVista program. *The Hitch Hiker's Guide to the Galaxy* (London: Pan Books, 1979), 49–50. A further example of recent MT and teletranslation fantasy can be found in Harry Harrison and Marvin Minsky's *The Turing Option* (London: Roc, 1993), which describes the office machinery of the future, the "languaphone" and "voxfax."

8 For a transcript of Clinton's speech, see <www.pbs.org/newshour/bb/white_house/jan-june00 /sotu5.html>. The fantasy of a universal machine that transcends differences also extends to wireless and the capacity to transcend differences in video technologies, electrical systems, telephone services, and so forth.

9 An influential report in 1966 by the National Academy of Sciences' Automated Language Processing Advisory Committee (ALPAC), which concluded that the idea of a fully automatic and perfect machine translation of all texts on any subject was unrealizable, facilitated this split between theory and pragmatic, localized research. After ALPAC's report advising on the prospects for machine translation, "Languages and Machines," much funding in the US was canceled and industry attention turned toward more particular and local machine translation projects: computer-based tools for translators (bilingual dictionaries); MT systems with humans doing the post-editing work to clean up the first copy (e.g., SYSTRAN and LOGOS); MT systems capable of working with specific discourses and controlled language output-input (e.g., the basic business message with standard greetings); and MT systems for the unrestricted input of vernacular language (research into this has increased with the widespread use of the Internet). ALPAC, *Language and Machines: Computers in Translation and Linguistics*, Division of Behavioral Sciences, National Academy of Sciences, National Research Council Publication 1416 (Washington: NAS/NRC, 1966).

10 Weaver, "Translation," 22. In addition to speech recognition technologies, MT is now also the province of AI research since accurate translation arguably suggests that the computer comprehended the input. In *The (Im)Possibilities of Machine Translation*, Anja Schwarzl considers the future use of artificial neural networks to improve MT performance (Frankfurt: Peter Lang, 2001), 210–223. Also see Yorick Wilks, "Machine Translation and Artificial Intelligence," *Translating and the Computer*, ed. Barbara M. Snell (Amsterdam: North Holland Publishing Company, 1979), 27–43.

11 The possibility of voice transcription was considered by Vannevar Bush in "As We May Think," but he noted that "our present languages are not especially adapted to this sort of mechanization." *The Atlantic Monthly* (July 1945): 95. For recent research on teletranslation, voice communication programs, and the automatic translation of the spoken word, see Minako O'Hagan, *The Coming Industry of Teletranslation* (Clevedon, UK: Multilingual Matters, Ltd., 1996) and Minako O'Hagan and David Ashworth, *Translation-Mediated Communication in a Digital World* (Clevedon, UK: Multilingual Matters, Ltd., 2002).

12 Because there is an absence of a stable data resource that is consistent across different platforms, there is a need for integrated and integratable data. The concept of universal data speaks to the development of data translation schemes that would move disparate data to a common architecture and thereby eliminate disparity.

13 See Lawrence Venuti, *The Translator's Invisibility* (New York: Routledge, 1995) and *The Scandals of Translation: Towards an Ethics of Difference* (New York: Routledge, 1998); Gayatri Spivak, "The Politics of Translation," *Outside in the Teaching Machine* (New York: Methuen, 1993), 179–200; and Lydia Liu, *Translingual Practice: Literature, National Culture, and Translated Modernity—China, 1900–1937* (Stanford: Stanford University Press, 1995) and Lydia Liu, ed., *Tokens of Exchange: The Problem of Translation in Global Circulations* (Durham, NC: Duke University Press, 2000).

14 Venuti, *The Scandals of Translation*, 186–89.

15 Spivak, "The Politics of Translation," 182; Venuti, *The Scandals of Translation*, 188.

16 Liu, *Translingual Practice: Literature*, 26.

17 Lisa Parks, "Kinetic Screens: Epistemologies of Movement at the Interface," unpublished manuscript, 21.

18 These are matters for ongoing case studies within the humanities and would require that we engage with the extensive research published by the Dutch John Benjamins Publishing Company. For reviews of different MT systems and government projects up to 1988, see the essays collected in Jonathan Slocum, ed., *Machine Translation Systems* (Cambridge: Cambridge UP, 1985).

19 Among other topics, these researchers consider whether the best MT system approximates the processing of language by the human brain; endeavor to answer the question of whether a syntactic or semantic approach is best suited for MT systems; and attempt to determine whether syntax or morphology ought to be privileged in MT. See Slocum; Sergei Nirenburg, ed., *Machine Translation: Theoretical and Methodological Issues* (Cambridge: Cambridge University Press, 1987); Martin Kay, "Multilinguality: Overview" and "Machine Translation: The Disappointing Past and Present," *Survey of the State of the Art in Human Language Technology*, ed. Giovanni Varile and Antonio Zampolli (Cambridge: Cambridge University Press, 1997), 245–250; D. Arnold, et al., *Machine Translation: An Introductory Guide* (Oxford: Blackwell, 1994).

20 However, it is not a true or equal meeting and encounter between a natural language such as English and a programming language. The compiler-translator works between assembly code and higher-level programming languages, which are themselves based on English, but these higher-level languages are independent of machine code and independent of any one particular computer. A kind of translation must occur from a natural language to these programming languages, since one must decide what kind of output or results one wants before setting down the instructions or input to achieve them.

21 David Simpson addresses the anti-nationalist, "democratic imperative" of Basic in "Prospects for Global English: Back to BASIC?" *The Yale Journal of Criticism* 11.1 (1998): 304, 306.

22 Weaver, "Translation," 23.

23 English-Vietnamese projects in the 1970s would be another example. See Makoto Nagao, *Machine Translation: How Far Can It Go?*, trans. Norman D. Cook (New York: Oxford University Press, 1989), 17–21.

24 Weaver, "Translation," 18. The link Weaver draws between MT and the field of cryptography is also discussed in Melby, 16–19, Nagao, 19; Henisz-Dostert, et al., 10; Hutchins, *Early Years in Machine Translation*, 18–20; Mona Baker, *Routledge Encyclopedia of Translation Studies* (New York: Routledge, 1998), 140; and Locke and Booth, 2.

25 Weaver, 22. Notably, Weaver refers to himself in the memo not only in the third person, but in initialized form, such that his name is itself a cipher.

26 Melby also notes: "Weaver suggests that there is a universal basis for language and that if we could find it, we would be able to use it as an interlingua, that is, something which is neutral and in between various languages" (17).

27 "Popeye the Sailor Meets Ali Baba and the Forty Thieves," *70 Years of Popeye* (New York: Winstar Home Entertainment, 2000).

28 Melby, 17.

29 Jacques Derrida, *Of Grammatology*, trans. Gayatri Spivak (Baltimore: Johns Hopkins University Press, 1976), 110.

30 Claude E. Shannon and Warren Weaver, *The Mathematical Theory of Communication* (Urbana: University of Illinois Press, 1949).

31 Weaver, "Translation," 23.

32 Warren Sack and Sawad Brooks, *Translation Map*, Walker Art Center Online Exhibition: *Translocations*, February 2003, available at <translationmap.walkerart.org>.

33 Sack and Brooks, "How Does it Work?" available at <translationmap.walkerart.org>. In their project proposal, they state that "it may be time to critically examine many of the so-called 'fixes' of computer science with the same sort of skepticism Ludwig Wittgenstein applied in his examination of the 'problems' of philosophy. Many of the 'problems' of natural language processing may stem from a badly chosen set of foundational propositions." Proposal available at <www.cs.unm.edu/~sawad/walker/proposal/test4.html>.

34 See Sack, *Conversation Map*, available at <www.sims.berkely.edu/~sack/cm>.

35 Friedrich Kittler, "There is no software," *Literature, Media, Information Systems: Essays by Friedrich A. Kittler*, ed. John Johnston (Amsterdam: G&B Arts International, 1997), 148.

36 AltaVista's web translation system, Babelfish, is currently handled by Systran, which is also used by the European Union in their internal system. As of July 2002, Systran handled English, French, German, Spanish, Italian, Portuguese, Greek, and Dutch, and it treated English as a "relay language" whereby an on-the-fly translation from German to Italian would first pass through English. Systran does have a program for Chinese and Russian translations (both monodirectional into English) and for Japanese (bidirectional for English), but none of these are yet available on the web. See <www.systransoft.com/LP.html>. Other major machine translation programs include Globalink ("Bringing down the tower of Babel. Translation @ your fingertips.") at <www.globalink.com> and Entente, "a small-but-adequate 3500 word vocabulary, and relies on the intelligence of people to compensate for its minimal grammar. It uses neither plurals nor conjugations (e.g.: 3 MAN ROB BANK YESTERDAY) and listeners smile at the grammar, but grasp the meaning very well." Available at <www.diac.com/~entente>.

37 Unicode web site available at <www.unicode.org>.

38 Also see Manuel De Landa, *A Thousand Years of Nonlinear History* (New York: Zone Books, 1997), 253–4.

39 Joe Lockard, "Resisting Cyber-English," *Bad Subjects* 24 (February 1996), available at <english-www.hss.cmu.edu/bs/24/lockard.html>.

40 For EuroMax and EuroMix, <www.euromixonline.com/>.

41 See <www.systransoft.com/>. Systran was developed as a Russian-English translating machine in 1973 and has been used at the European Commission in Luxembourg since 1976. LOGOS was developed for English-Vietnamese translations in the 1970s. Also, TAUM MATEO was developed for the translation of basic Canadian weather reports into English (the system was not adaptable for more complex use in the Canadian aviation industry). See Peter Toma, "An Operational Machine Translation System," *Translation: Applications and Research*, ed. Richard W. Brislin (New York: Gardner Press, Inc., 1976), 247–59; Peter J. Wheeler, "Systran," *Machine Translation Today: The State of the Art*, ed. Margaret King (Edinburgh: Edinburgh University Press, 1987), 192–208; Andrew Chesterman and Emma Wagner, *Can Theory Help Translators?* (Manchester, UK: St. Jerome, 2002), 115–32; Nagao, 29–31.

42 An illustrative example of a web-based and local translation software platform for documents and emails is Amakai Enterprise, available at <www.amikai.com>.

43 Lockard.

44 Andy Ewers, *The European Internet: An Update* (London: British Library Research and Development Department, 1995), especially 18.

45 *Internet Operator Europe* 1.8 (18 December 1996): 14.

46 Odd de Presno, *The Online World*, Chapter 9: "Your electronic daily news," <home.eunet.no/~presno/bok/9.html>.

47 CRIBE: A Chat Room in Broken English, available at <www.cup.com/bm7/cribe.htm>.

48 Rainer Ganahl, "Free Markets: Language, Commodification, and Art," *Public Culture* 31:1 (2001): 29.

49 McKenzie Wark, "Netlish—English Language on the Internet," originally published in *Wired UK* and available at <www.dmc.mq.edu.au/mwark/warchive/Other/netlish.html>. In his extensive catalogue of the impact of the Internet on language, David Crystal takes a more optimistic view and argues that in fact "Netspeak" is "a genuine linguistic variety." Instead of an absence of standards, Crystal finds spelling and punctuation conventions, such as the use of angle brackets, particular to the medium. *Language and the Internet* (Cambridge: Cambridge University Press, 2001), 90–2.

50 Ogden and Richards's Basic project was developed with similar principles. While the primary function of Basic was communicative and not literary, literary translations were used to demonstrate the flexibility and affective power of its limited vocabulary. See Leonara Lockhart's model translation of Leonhard Frank's *Carl and Anna* (London: Kegan Paul & Co., 1930).

51 John Hutchins notes that MT was for a time considered for literary use, but it quickly became oriented toward technical and scientific discourses, in which meaning could be treated as singular and univocal. John Hutchins, ed., *Machine Translation: Past, Present, Future* (Chichester, West Sussex: Ellis Horwood Limited, 1986), 3.

52 Locke and Booth, vii.
53 Ibid.
54 Julian Dibbell, "After Babelfish," *FEED* (July 26, 2000), available at <www.juliandibbell.com/texts/feed_babelfish.html>.
55 See Crystal, 84–86, 229–31.
56 UNL is an MT system, somewhat like a semantic Interlingua in that it uses a conceptual language or code for translation. See <www.unl.ias.unu.edu/>.
57 See Reuters, "China Blocks VeriSign from Registering Net Names," November 17, 2000, available at <news.com.com/2100–1023–248786.html?legacy=cnet> and the VeriSign Character Variant Solution, available at <www.verisign.com/nds/naming/idn/learn/variants/solution.html>.
58 Kittler, "Protected Mode," *Literature, Media, Information Systems,* 166.
59 See <198.182.96.5/Citrix_WinFrame.html>. The more recent WinFrame 1.8 is not to my knowledge advertised in the same terms. Lotus SmartSuite (at this writing up to Millennium Edition R9.7) continues to list Global English as the first supported language. See <www.lotus.com/products/smrtsuite.nsf/wAbout/C857626228698C1E8525679000768231>.
60 Nancy Hoft Consulting, *Case I: Going Global*, <www.world-ready.com/cases/case1.htm>.
61 "Thomson Learning Expands Its Focus on the Global English Language Teaching (ELT) Market; Company Expands Resources to Develop New Products and Services For This Growing Marketplace," PR Newswire, September 19, 2000, available at <www.thomsonlearning.com>. MultiLingual catalogs and reviews a substantial number of language learning sites, available at <www.multilingual.com/FMPro?-db=a&-token=now&-format=default.htm&-view>.
62 "Lernout & Hauspie Announces Licensing Agreement With America Online; Agreement to Cover Variety of L&H Information and Knowledge Management Tools," Ieper, Belgium and Burlington, Massachusetts, March 8, 2000.
63 See Bourdieu, "The Production and Reproduction of Legitimate Language," *Language and Symbolic Power*, ed. John B. Thompson, trans. Gino Raymond and Matthew Adamson (Cambridge: Harvard University Press, 1991), 43–65. Thomson Learning available at <www.thomsonlearning.com>.
64 Paul Rubens, "Say it in Global English," *New Zealand Infotech Weekly* (July 29, 1996): 3. Learnz Corporation, "Writing Global English for Asia and the Internet," <www.nzwwa.com/shop/learnz>.
65 Shannon and Weaver, 3.
66 On the language limitations of ASCII, see William Wresch, *Disconnected: Haves and Have-nots in the Information Age* (New Brunswick: Rutgers University Press, 1996), 132.
67 MIME = Multipurpose Internet Mail Extensions. Mime allows for much more extensive character encoding. XML = Extensible Markup Language, which is a simplified version of SGML and designed exclusively for web documents. It is not supported by all web browsers.
68 See <www.multilingual.com/FMPro?-db=a&-token=now&-format=default.htm&-view>. There are also universal languages of software development such as The Unified Modeling Language (UML), "the industry-standard language for specifying, visualizing, constructing, and documenting the artifacts of software systems." See Grady Booch, et al., *The Unified Modeling Language User Guide* (Reading, MA: Addison-Wesley, 1999).
69 *New Scientist* (March 9, 1991). The Unicode Standard, Second Edition, is available at <www.unicode.org/unicode/uni2book/u2.html>. The transliteration of major languages into a Roman character and establishing a singular notation system such as Unicode for as many written languages as possible are serious issues for MT. One cannot even enter the murky terrain of lexical relations (matches and mismatches) between, for example, English and Japanese, until both languages are represented by the same code, either with something like Unicode, or by first writing the Japanese characters (Kanji, or *kana* alphabets) into the Roman alphabet so that it can also be rendered in ASCII. Character recognition for Japanese and Chinese is now fairly advanced, as evinced by recognition tools such as Codeguess, available at <www.erols.com/eepeter/codeguess.html>, Intelliscope (Belgium-based Lernot & Hauspie), and Alis Qué (Canadian Alis Technologies).
70 John Cayley's programmable poetry and algorithmic texts, such as *Indra's Net* and *river-Island*, exemplify the aesthetics of programming languages. See <shadoof.net>.

71 COBOL (Common Business Oriented Language); BASIC (Beginner's All-purpose Symbolic Instruction Code; J.G. Kemeny and T.E. Kurtz, 1967); FORTRAN (formula translation and the "Sanskrit of computer tongues" *Scientific American* 34.3 [December 1979]); ALGOL (algorithmic language; an international algebraic language); PL/1.

72 There is a different element of translation within the tower of programming languages, which has an internal variation. Machine code is the language of the machine (binary code, numerical format); assembly code is the next level, with a symbolic representation of instructions, such as abbreviations and mnemonic names, converted to machine code by an assembler. Then there are programming languages, first called auto-codes (low-level programming language), now high-level languages such as BASIC and PASCAL that use a mathematical-like method of notation, are compiled, and are close to English in structure and vocabulary. Programming languages do not require a knowledge of machine code and they are independent of any one particular computer. See <www.webopedia.com /TERM/p/programming_language.html>.

73 The idea that English can function as a neutral linking language is increasingly legitimated by political economists and historians. On the new mandate for English-language instruction in Switzerland, and on the premise that English is more necessary for business abroad and that English serves as a kind of "national link language" among the German- and French-dialect speakers of the same country, see "Do you speak English? Jaa, es bitzli," *The Economist* (February 14, 1998): 52. On the renewed role of English as a pragmatic global language, see Seth Mydans, "Nations in Asia Give English Their Own Flavorful Quirks," *New York Times* (July 1, 2001).

74 Kittler, "There is no software," 148.

75 To a certain extent one can speak in eschatological terms concerning the "ends of English," as reflective, constituted by, or otherwise bound up with the "ends of history" and the "end of man."

76 Jean-Francois Lyotard, *The Postmodern Condition: A Report on Knowledge*, trans. Geoff Bennington and Brian Massumi (Minneapolis: University of Minnesota Press, 1984), 5.

77 Ibid.

78 The term "pasigraphy" is based on a Greek root meaning "writing for all men." See de Mémieu, *Prospectus for Pasigraphy, or First Elements of the Art of Printing and Writing in a Language to be Understood in all Languages without Translation* (London: T. Baylis, 1795) and *Pasigraphy, or Lessons in the Art and Science of a Universal Written Language* 1:1 (January 1894).

79 Michael Hancher has written on the trust that we are asked to place in the technical intelligentsia as they authenticate or de-authenticate digital documents. "Blackstone and Electronic Text," MLA annual convention, Washington, D.C., December 2000.

80 Armand Mattelart, *Mapping World Communication: War, Progress, Culture* (Minneapolis: University of Minnesota Press, 1994), 229. Also see Daniel Bell's earlier commentary on intellectuals and the technocratic mode: "The new technocratic world is one shaped increasingly by engineers and economists, the riders of technology and rationality—a one-dimensional world, in Herbert Marcuse's phrase—if left unchecked." *The Intellectual and the University* (New York: The City College, 1966), 4.

81 Castells, *The Power of Identity* (Cambridge: Blackwell, 1997), 49.

82 On digitization and the universal language of the binary code, see Cees J. Hamelink, *Trends in World Communication* (Penang: Southbound and Third World Network, 1994), 70–77. On the "universal digital language," see Castells, *The Rise of the Network Society* (Cambridge: Blackwell, 1996), 2. Also see Lyotard on the "new languages": "machine languages, the matrices of game theory, new systems of musical notation . . . the language of the genetic code" (40).

83 Ellen Ullman, "Elegance and Entropy: Ellen Ullman Talks with Scott Rosenberg About What Makes Programmers Tick," *Salon Magazine* (October 9, 1997), available at <www.salon1999.com /21st/feature/1997/10/09interview.html>.

84 Kittler, "Protected Mode," 166.

85 On the "functionality of translation," see Venuti, *The Scandals of Translation*, 158.

86 Daniel Bell, *The Coming of Post-Industrial Society: A Venture in Social Forecasting* (New York: Penguin Books, 1973), 354.

87 Bell, 354.

88 Lyotard, 4.