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WHAT BILL GATES
(AND THE REST OF US)
COULD LEARN FROM
THE INVENTOR
OF MASS
COMMUNICATIONS.

Dialogue in Cyberspace

Scene: The spirits of printing pioneer Johannes Gutenberg and computer whiz kid Bill Gates hang above the Frankfurt Book Fair. Both are the size of barrage balloons, silvery and lightly tethered. Such morphing is no problem for the magical software of Mr. Gates, but the great enlargement poses a problem for Herr Gutenberg, since so little is known about him, and that mostly from lawsuits. The shadowy details make enormous dark patches in his inflated image. Vagueness in, vagueness out, as the saying goes.

Beneath these two hovering spirits there sprawls the Fair, a bustling market of the publishing industry—books, stalls, posters, salesmen, even authors, quaint doomed creatures carefully shepherded about, by vivacious publicity facilitators wearing miniskirts and spike heels, from one ill-attended press conference to another.

There is a constant hubbub, as on the deck of a sinking ship, of people keeping one another's courage up.

Gutenberg (*marveling*): What a circus! This commodity must be as precious as gold!

Gates: Cheap as dirt, actually. And on the way out. It's called print. You invented it. Or so history claims, *faute de mieux*.

Gutenberg: Printing was one of my sidelines—I was a goldsmith, by trade. Such fine work I used to do! After the intricacies of a signet ring or a necklace clasp, the technology of movable type seemed a game.

One engraved the punches of hardened steel—this was an old process—and then punched the copper matrices, and then poured the type, of lead strengthened with tin and zinc; the hard part, the stroke of genius, was the adjustable mold, composed of two L-shaped pieces. Letters, you see, are not all of the same width, but it was important that the pieces of type be the same height and the same depth—else the inked impression would be hopelessly uneven.

Gates (*impatient with all this obsolete technology*): Yeah, yeah. I remember a similar problem arose when I was mapping the first version of Microsoft Basic—

Gutenberg (*who is slightly deaf, from all those years of gold hammering*): The thing about those first books, we wanted them to be beautiful, just like the finest manuscripts. The Bible and the Psalter had to have ornamental initials, in two sections, each inked separately and reassembled for each impression. It was tedious, but we thought if the books reflected God's glory less fully than the manuscripts that the monks turned out, nobody would take them seriously.

This idea of mass production, of many different books, of new books all the time, it came later, after Fust foreclosed and took everything from me, and Peter Schoeffer, that traitor, went over to him, with all that I had taught him.

Gates: Lawsuits, don't mention them. Microsoft must have 60 going at any one time. These information revolutions, they don't come friction-free.

Gutenberg: What is this Microsoft? The title of a romance? The angels tell me that, once people lost interest in religion, they began to read fables called romances, and all sorts of godless mischief ensued, for which my invention was to blame.

Gates: Microsoft is bigger than a book, by a factor of billions. It makes programs, which are ways to make a book, among other things. A program is the software, and the hardware is those little boxes you see down there, with the shining faces.

Gutenberg: Ah, I thought perhaps those were a new species of human being—heads without bodies. I see they are often consulted, like sages, and the alphabets attached to them are often caressed.

Gates: They're better than heads, actually. The circuits are more logical than a brain's circuits—no sex, no religion, no funky old anger and fear. No ego. Pure computing and memory. And communication—wow, do they communicate! And we're just at the beginning! If this were the print revolution, we're not even at the year 1500. The presses haven't begun to roll, man!

Gutenberg (*peering down politely*): And what are they communicating?

Gates (*momentarily at a loss*): Why, you know—stuff. Information. Anything you communicate any other way, but faster. Bank statements. Airline reservations. Love letters, if you're into that, and the significant other is also on the Internet.

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Pornography, for that matter—virtual sex and violence, in a year or two, as the technology develops. Data.

See that woman, there? She's pulling up the latest sales figures from New York, though it's still three in the morning there. That guy in the booth next to her? He's filing a press release, that in four seconds will be printed out in Singapore.

Gutenberg (*grasping at the familiar concept*): Printed, ah. And on what sort of press? Our press, before that rascal Fust took everything, had been an old wine press.

Gates: No more presses, Mr. G. Just the touch of light. No more lead molds and messy old ink balls leaking lamp black and linseed oil. It's all bytes and pixels and lasers now—no human muscle needed.

Gutenberg (*squinting down*): And yet these glowing faces—what do you call them?

Gates: Computer screens.

Gutenberg: And yet these screens contain what seem to be letters, though very unbeautifully formed. Crude and hateful to the eyes though they are, a monk in his scriptorium could make sense of them, and set to copying them. How have letters survived your electric revolution?

Gates: Merely as a human convenience. The computers don't use them; they talk to themselves and to each other in bits, the smallest possible unit of information.

A bit is the presence or absence of a pulse of electricity in an instant of time, or else the presence or absence of a charge of static electricity in a memory device.

Doesn't sound like much, but they add up to quite a web of input and output as they move around through systems of built-in switches called, funnily enough, gates. It's hard to explain, and you can't see a thing without a microscope, but, believe me, it works.

When these machines do math, it's not at all like you and me doing math; they run a wild guess through a series of loops enough times until they close in on the answer, and work on a hexadecimal base of 16 instead of 10, which derives, as you know, from our fingers and toes.

In the split second before the computers flash the answer, they translate it back into 10 base, for our convenience.

Letters are like numbers—they're an interface. That's another concept for you, *interface*. It's like, say, the Church

in your day was an interface between men and God. Or the printed page became an interface between one man's brain and another's voice. The alphabet was an interface between spoken language and the human eye.

Already, there are computers that can take in and put out spoken language. Already, a generation or two has come along that can't be bothered to read; it absorbs all of its information from television and musical tapes.

When you think about it, the printed page was an awful lot of work, and not a healthy use of your body, sitting and staring.

Gutenberg:
You speak of this
global Internet as if it
transcended human
brains; but man is
still the measure
of all things.

Gates:
That can be fixed,
eventually.

Face it, friend, even at the height of the Gutenberg revolution, only a tiny fraction of mankind read, and most did it for business purposes. It strained the eyes, overexcited the brain, and was antisocial. Gutenberg: But... those people consulting with their screens, are they not reading? What does the material that holds the letters matter, whether it be stone, papyrus, vellum, rag paper, paper made of wood pulp, or a plastic screen?

Further, these words made of electric impulses, do they not need a source of electricity nearby and, as you say, a computer to render them visible? Though I see a number of computers small enough to be portable—

Gates: Laptops, we call them.

Gutenberg: —I see none as small and light as a modern book, which requires no electricity, and which can be entered—

Gates: Accessed.

Gutenberg:—by simply opening its bound, sequentially numbered pages. How could information, or intellectual adventure in its many sorts, be more handily and—since one does not need to be a goldsmith to desire traces of eternal harmony in the objects of everyday human use—pleasingly packaged?

Gates (*holding up a small, exquisite, iridescent disk, a CD-ROM*): In my hand, I hold thousands of pages, reduced to magnetized digits.

Already, the sales of paper encyclopedias, in their many ponderous volumes, are withering before the appeal of these shimmering disks, which, in the flicker of a few computer keys, will yield not only the desired information but illustrative pictures in 64-color display, diagrams that can be explored like three-dimensional models, and specimens of music, played aloud!

Access and amplitude—these are the virtues of digitized information—the card catalogues of entire libraries, the bulging, groaning repositories of the fading, crumbling fruit of your revolution have been reduced to computer memory, exhaustively searched in a twinkling! No more fumbling at dog-eared pages. You had your day, old fellow, your five centuries I should say, and now we must pack up your clumsy, dust-collecting, forest-wasting printed matter.

This Fair beneath us is in truth a wake, just as, in the words of your great German philosopher Nietzsche, churches are in the truth the tombs and sepulchres of God.

Gutenberg (*hesitantly*): Perhaps the book, like God, is an idea some men will cling to. The revolution of print pursued a natural course. Like a river, print flowed to its readers, and the cheapness of the means permitted it, where the channel was narrow, to trickle.

This electronic flood you describe has no banks; it massively delivers, but what, to whom? There is something intrinsically small about its content, compared to the genius of its workings.

And—if I may point out a technical problem—its product never achieves autonomy from its means of delivery. A book can lie unread for a century, and all it needs to come to life is to be scanned by a literate brain.

This CD-ROM of yours—what machine will be able to read it a hundred years from now? Each generation of these machines destroys the previous; the very speed and momentum of your revolution erode its contact with the earth. You speak of this global Internet as if it transcended human brains; but man is still the measure of all things.

Gates (*collapsing with a hiss*): That can be fixed, eventually. ☒