Gresham in the Classroom

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Let X represent the amount of training required and the level of neural activity involved in doing arithmetic in one's head. Let Y represent the training required and the level of neural activity involved in doing arithmetic using a calculator. X is clearly greater than Y. X is more costly than Y too, in terms of time and trouble. Now if all that matters in the classroom, and in the workplace, is that the correct answers to arithmetical problems be produced as quickly as possible, then the capacity for doing mental arithmetic will soon disappear in the culture as whole. The use of calculators will drive out the doing of mental arithmetic, a skill that very likely has invisible, as-yet-undocumented, benefits upon other areas of cognition.

Let X be a tailored suit, with all its parts and refinements. Let Y be a T-shirt and jeans. If in the name of individual freedom and egalitarianism both become equally acceptable wear at the symphony, the opera, a fine restuarant…then, more or less slowly, more or less surely, T-shirt-and-jeans at concerts and fine restaurants and other venues once regarded as formal will become universal.

If leather seats are a mark of quality in expensive cars and we cannot easily tell the difference between leather and leather-patterned vinyl, then cars with "leather seating areas," i.e. cars that economically mix real and simulated leather here and there in order to capitalize on our inability to tell the difference, will come to be the norm.

If in their hiring practices, for any number of reasons (including fear of transgressing anti-discrimination laws), employers do not distinguish between academically high- and low-achieving high school graduates, then the academic performance of non-college-bound young people at high schools will decline—or rather, they

will have one more reason to decline. Once hired, if a smaller set of skills will produce the same product as a larger set of skills, then employers will neither train workers to have any more skills than absolutely necessary nor pay anyone more who is "over-qualified" for the job.

All these are variants of Gresham's Law, first proposed by Sir Thomas Gresham in 1560 but known to Aristophanes (5th Century B.C.). Gresham's Law states that "bad money drives out good money," that is, that over time, cheaper coinage drives more valuable coinage out of circulation, the more valuable coinage either being hoarded as a collectible or returned to the mint for replacement with larger quantities of the cheaper-to-produce coin. And so it has gone throughout history, silver coins replacing gold ones (of the same denomination), alloy coins replacing silver, paper money all but replacing coinage. Soon, computer bits will replace them all, and money, once the paragon and symbol of material worth, will become—more completely than it already has—a cipher, a mark, a digital wisp, an object no more material, finally, than it has to be to do fulfill its function with maximum efficiency.

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Now, biological and cultural evolution differ in several ways. In biological evolution, information is transmitted from generation to generation by genes; in cultural evolution it is transmitted by ideas and practices, or "memes." In biological evolution, change takes place over thousands and millions of years. In cultural evolution, change takes place over as little as ten to a few hundred years. Few of us, however, remember this: that whereas in biological evolution harmless-and-useless genotypic traits are as happily passed along as useful ones (useful, that is, to biological reproduction), in cultural evolution under a strict economic and technological regime, all "species" of goods are reduced to their least physical, least difficult-to-produce configuration. Those traits and qualities of a good which are not sufficiently valued by enough consumers are as mercilessly removed as harmful ones: that they cost time and/or money to produce is "harm" enough. Waste is not tolerated; performance is all.

Indeed, where nature qua nature is profligate in generating variations, is extravagant in expending energy, and fairly bursts with accidental and unnecessary finery, the fruits of modern human economies and mass culture are unripe, miserly. Under downward price pressure from users and consumers, the superfluous qualities

of a given sort of product are stripped away until only those that are "selling points" remain.

Nature knows nothing of Gresham's Law

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But what has all this to do with computers and education?

If X is the set of all things that a bank building is, or a lecture room, or a campus, and Y is the set of all things that are clearly done there—withdrawal and depositing of money, negotiation of loans, attending to a teacher or lecturer, going from class to class—then electronic banking by computer, telephone, and ATMs, and "virtual" schools and universities with TV and on-line classes, both of which ostensibly perform the same functions as are outlined in their respective Y-sets, will replace the concrete and stone banks, the musty lecture and class rooms, eye-contact with tellers and teachers, and the tree-lined campus avenues with all of their putatively irrelevant traits and qualities.

Similarly, educational multimedia CDROMs are easier to read—or should I say "funner to interact with"—than books, and claim to convey the same information. Actually, they do not, falling far short of the comparable book's comprehensiveness, ease of use, and pictorial resolution. But as we grow convinced that they do, so our children will soon spend the better part of their school day clicking their way through screenfuls of impoverished images and reduced paragraphs—mere captions—constructing in their minds a very loose picture of the subject matter, a picture pieced together, if it is at all, from the collage of "hyperlinked" data which they experience in an arbitrary order of snatches. So immediately rewarding is the process of clicking to get a whole new screen, or to get something to happen, that we can expect multiple-choice exams, already a degradation of active, problem-solving written exams, themselves to disappear, to be replaced with some sort of procedural tracking of mouse-clicks through a database judging "intelligent" or not in a statistical way.

The World Wide Web on the internet represents a similar cheapening. Ask people who use it if they actually study what they come across. Though they may not admit it, chances are that they race to the first underlined phrase or blinking icon, and "poof," are gone from the scene. Besides, with every passing day, "webspace" itself resembles more and more the shallow pages of a drugstore magazine rack, all slogans and advertisments.

I have no objection to the whirr of a hard drive replacing the sound of paper, or to the glow of a phosphor computer screen replacing the sheen of a paper page. Both media—computers and books—have their charms. This is not my point. The point is that the elimination of difficulty (in reading, calculating, understanding, building, dressing, speaking, doing, etc.) frequently betokens the elimination of a beneficial complexity, of real content and nuance, of longer term usefulness, of higher quality experience. Elimination of difficulty often involves the elimination, in other words, of those traits and qualities which run up production and learning costs to be sure, but which, unwittingly perhaps, we count(ed) upon as constituting the fullness of the experience itself and which provide(d) the source of our pleasure in mastery and connoisseurship.

In sum, any impoverishment of the set of attributes, qualities, and characteristics understood to be of value in any thing, will sooner or later lead to a corresponding impoverishment of what is produced in the name of that thing, as that thing. This is cultural devolution. This is Gresham's Law at it most universal, and chief among its casualties has been architecture in the second half of this century.

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Now it is sometimes argued that what goes on in college classrooms, studios, laboratories, libraries, and offices, and on the lawns and in the coffee shops nearby, is hardly physical. What goes on, rather, is the transmission of ideas and practices—of memes—in an environment sheltered from the exigencies of the marketplace. On this view, because education is about "information," the replacement of old-fashioned classrooms, chalkboard lectures, chair-creaking seminars, and doorstop textbooks with computers and bright CDROMs, with virtual classrooms and "distance learning," is to be applauded. They can get the job of education done while providing more freedom to both student and teacher.

But none of the assertions in the previous paragraph are proven. An enormous amount of tacit, qualitative, accidental, and educationally essential information is transmitted in classrooms, seminar rooms, studios and coffee shops, face-to-face, and face-to-printed-book. If only for want of being able to match the gigabytes of data flowing into our skin and eyes with every step through the real world, it will be a long while—perhaps 20

years—before cyberspace can match the serendipitous outcomes of strolling a campus or browsing a musty library isle or, for that matter, the enlightenment that comes from journeying through and dwelling in a serious text.

Do computers have a place in schools and universities nonetheless? Of course they do, and a major one. Accounting, payroll, purchasing, facilities management, course schedules and descriptions, class registration, financial aid administration, library reference and book-lending management, "phonebook" and biographical data dissemination, general email....the list of basic institutional functions being carried out with the use of computers is long and growing. The use of computers for research and writing also is growing and should: no one need throw away their word processor or spreadsheet program, their email or CAD software, their mass spectroscopy or statistical analysis package. But, with Gresham's ghost peering over my shoulder, I would caution against relying too soon on the wonders of multimedia, of hypertext, of the internet, and "virtual classrooms" to replace traditional formats of teaching and learning. Learning is not easy; never was; never will be. That correspondence schools, now almost a hundred years old, still cannot deliver the experience or the education—let alone the cachét—that a physical school or university can deliver, ought to be a lesson to us. That extension courses on cable TV are tedious and forgettable and only nominally effective ought to be a lesson to us. For their modern, computer-aided counterparts will not do much better for a long time to come. Indeed, the risk of experiential impoverishment for the sake of economic efficiency will not lessen until every student and every teacher has a teraflop-power computer with a gigabyte-speed connection to a terabyte-speed network on their desk. Until cyberspace is in its fullest flower, and even then, may we meet and learn in the air of this world. And pay for it uncomplainingly.

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