ALEXANDRIA AND THE CLOUD

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The burning of the great library of Alexandria is often cited as representative of a recurring inability to preserve our collected informational treasures and artifacts. Although it would be convenient to attribute the library's destruction to something or somebody terribly evil, history advises us that it was burned or destroyed either by accident or intentionally at least four times. Various culprits include Julius Caesar in 48 BC; the Patriarch of Alexandria, Theophilus, in 391 CE; the 5th Century CE Jewish-Christian riots; and – just to make sure every religious persuasion is represented -- the Moslem Caliph Omar, who sacked Alexandria in 640 CE.

Discussing the loss of the library, historian Preston Chesser observes, "the real tragedy…is not the uncertainty of knowing who to blame…but that so much of ancient history, literature and learning was lost forever." A somewhat less elegant admonishment likewise might be made that it is never particularly smart to hide the family fortune all in one place.

Nonetheless, we humans do seem to exhibit a penchant to collect and squirrel away our intellectual and cultural treasures. This behavior is recurring in the sense that the concentration and contrary dispersion of these informational artifacts seems to a follow cyclic pattern. As might be expected, significant risks and benefits occur at both the zenith and nadir of each cycle, where information is either the most concentrated or dispersed.

Historically, it can be argued that, from the Seventh Century CE with the destruction of the Alexandria library until the invention of the Gutenberg press in 1440, the residue of Western information resources was concentrated and centrally controlled by the organized Christian church. With Gutenberg's press, however, a trend in the dispersion of information was begun that ultimately flowered in the democratization and secularization of modern intellectual thought.

In the context of United States history, corollary institutions evolved that have further enhanced freely dispersed information – first in the late 19th Century the emergence of a nationally pervasive system of public education; and somewhat later, an equally broad distribution of public libraries. To these developments, must also be added the invention and popularization in the early 20th century of commercial radio, and by the middle of that century, television.

But, with the highly dispersed popularization of information media such as radio and television, comes the recognition of informational risk – that not only can broadly dispersed information be intellectual and educational, it also can be banal and at times substantively wrong. In either form, the unmitigated concentration *or* distribution of information carries a concomitant payload of social risk – from the illiterate monk blindly copying passages of the vulgate to a television commentator spewing a diatribe of hate.

Interestingly, just as the Gutenberg press appeared in a world in which information was highly concentrated, by contrast a half-millennium later the first computer was introduced in an era of highly dispersed information. Reflecting their military genesis, these early machines were conceived as weapons to battle the "information explosion" of the mid-20th Century. Indeed, they were designed around a primary or "central processing unit", which both nominally and operationally reflected their purpose – to centrally concentrate, store and process information.

By the mid-1960's the International Business Machine corporation was manufacturing the IBM System 360, which was marketed as a computer that served the "full circle" of both scientific and commercial computing – a paradigm of informational centralization that was anathema for many of the intellectual radicals of that era. Indeed, the System 360 -- as did competing "mainframe computers" produced by Control Data Corporation, Scientific Data Systems and Digital Equipment Corporation – operated in an environmentally controlled data center, an electronic citadel sealed from the outside world. It is not surprising that many humanists saw in those early machines all that Orwell envisioned in his *1984.*

But when 1984 did occur the Orwellian nightmare did not. By contrast something called the "personal computer" or "microcomputer" had appeared. These small machines represented a return to information dispersion by bringing data processing and storage in to individual people's homes and businesses. The appearance of these little computers at the time that they did is interesting. Parchment scrolls such as those stored at the Alexandria library had been in use for millennia. The printing press dominated information distribution and storage for 500 years, radio and television for fifty, and mainframe computers for twenty-five. In a phenomenon observed and commented upon by the French philosopher, Theilhard de Chardin, information technology seems to evolve much in the same manner as life itself – in a series of iterations in which each iterative cycle has a duration which is fraction of the cycle that has preceded it.

During the 1990's personal computers decreased in size but grew in power, thus increasing their capacity to disperse information. But as the 21st Century approached, so did the Internet and with it the potential for externally concentrated information. In this regard the first ten years of the new century might well be described as the "decade of the download" – a battle ground between highly concentrated Internet data and the legions of dispersed personal computers and allied devices that accessed it.

It appears, however, that the recent struggle between the forces of informational concentration and dispersion is ending, with victory clearly resting in the camp of the former. In short, the newest weapon of information technology - cloud computing – ensures that we are about to enter a new reign of information concentration.

In this context, however, let us not forget Lord Acton's admonishment regarding absolute power, for there is something equally frightful inhering in the absolute concentration of information.

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(This is a two part article. In Part II, the specific risks and benefits of cloud computing, so-called "software as a service", and related ramifications of highly concentrated technology-based information, will be explored further.)