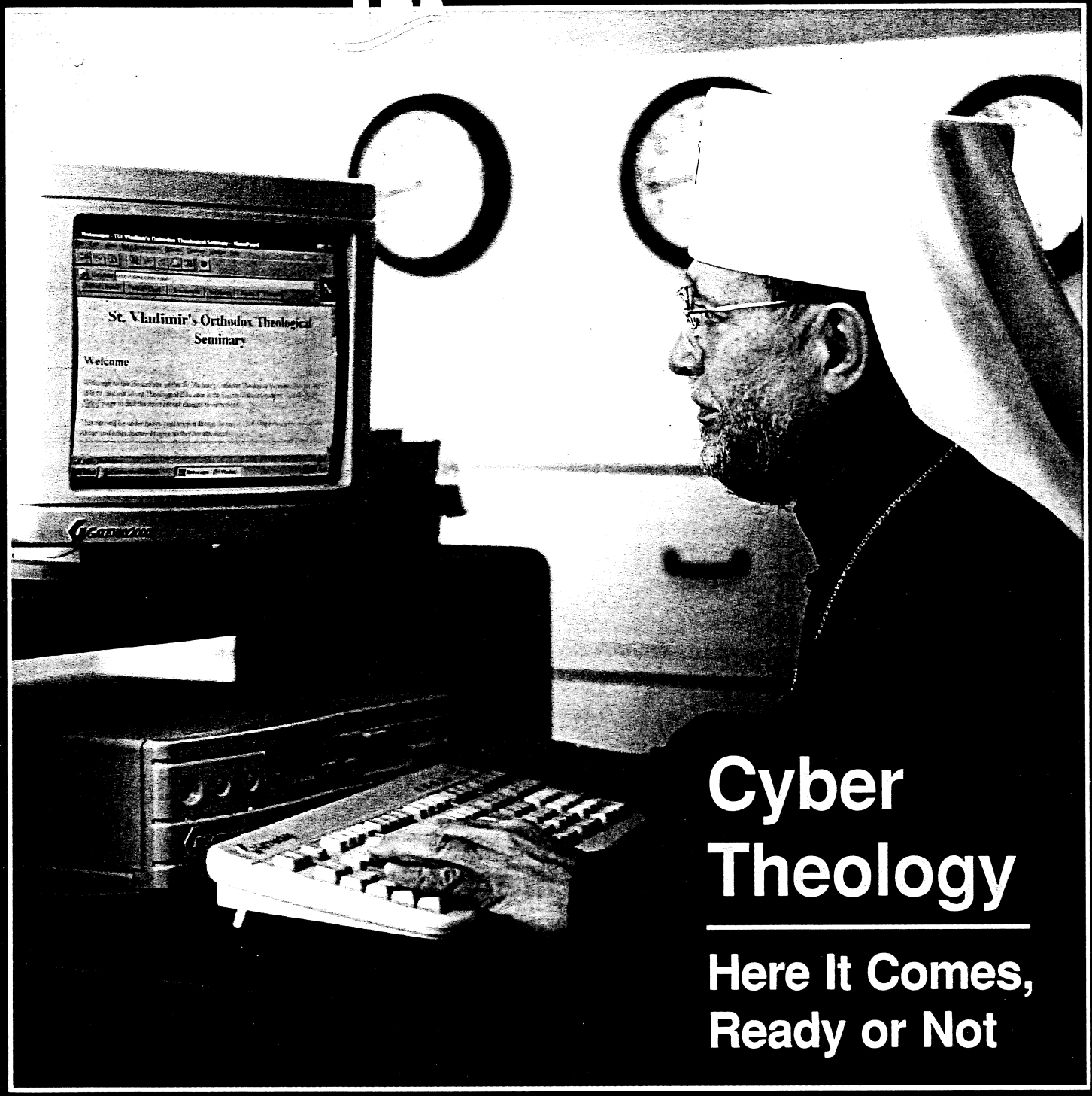
$5

New Year 1997

·IN TRUST·



Cyber Theology

Here It Comes, Ready or Not

The Magazine for Leaders in Theological Education

Why Go to College To Learn?

The Internet May Signal the Last Days of the University

By Eli M. Noam

In this article Eli M. Noam outlines the ways new technology threatens the economic foundations of universities. He warns that in the future, alternative instructional technologies and credentialing systems offered by the private sector will be far less expensive than campus-based higher education. Universities will be in danger of losing students to the private sector unless they capitalize on the strength of their college community and the intellectual guidance they offer. Trustees will need to decide where their school fits in this scenario and what measures they can take to ensure its survival in the technological era.

By now, everybody knows about the tremendous advances in communications technology that will link the information resources of the globe. But while these technologies are likely to strengthen research, they will weaken the traditional major institutions of learning, the universities. Many of the universities' traditional functions will be superseded, their financial base eroded, their technology replaced, and their role in intellectual inquiry reduced.

Scholarly activity, viewed dispassionately, consists primarily of three elements: to create knowledge and assess its validity; to preserve information; and to pass it on to others. Accomplishing each of these functions is based on a set of technologies and economics. Together with history and politics, they lead to a set of institutions. Change the technology and economics, and eventually the institutions must change also.

How Information Used To Flow

Information institutions started about five to eight thousand years ago when specialized preservers and producers of information emerged in the form of priests. Collectively they were also the primary information storage medium of their societies. Since reliance on individual and group memory to transmit information across time and space was inefficient, recording methods were developed. Writers had to be trained, creating a need for schools. Writing, in turn, led to formal information-storage institutions.

Under the Assyrian king Assurbanipal (668-627 B.C.), documents at the royal library in Nineveh were arranged by subject. Wise men congregated there to use the information and to add to it. No doubt they also argued among themselves and were surrounded by disciples. Thus, knowledge and inquiry were already being organized along lines strikingly similar to today's university departments.

This model—centrally stored information, scholars coming to the information, and a wide range of information subjects under one institutional roof—was logical when information was scarce, reproduction expensive and restricted, and specialization low.

How Information Now Flows

This system of higher education remained remarkably stable for over two thousand years. But today's production and distribution of information are undermining the traditional flow of information and, with it, the university structure, making universities ready to collapse in slow motion once alternatives to their function become possible.

Most branches of science show an exponential growth of about 4 to 8 percent annually, with a doubling period of ten to fifteen years. One response of organizations that must handle the increased volume of information is to improve processing capabilities. But the main strategy is *specialization*. As the body of knowledge grows, fields of expertise evolve into ever-narrower slices, and universities can no longer maintain coverage of all subject areas. Many specialized scholars also find fewer similarly specialized colleagues on their own campus. Instead, scholarly interaction increasingly takes place among distant specialists in the professional rather than the physical realm.

None of this is new. But as the information-induced pressures of specialization have grown, so have the means to make the invisible college the main affiliation. Electronic communications are now creating new electronic scholarly communities. Ironically, it is the university that pays for the network connectivity that helps its resident scholars shift the focus of their attention to the outside or to join virtual communities in cyberspace.

If alternative instructional technologies and credentialing systems can be devised, there will be an out-migration from classic campus-based higher education.

Storage and Transmission

The second function of the university is the storage of information. It was once said that a university was as strong as its library. But as the production of scholarship rises exponentially, so does the cost of acquisition and reference. At the same time, electronic alternatives have become powerful in storage, broad-ranging in content, and efficient in retrieval. Therefore, universities are gradually shifting from investment in the physical presence of information to the creation of electronic access. It is a logical response, but it undermines the fundamental need for the university as the physical location for specialized information.

This leaves the third function of the university, that of transmission of information, its teaching role. It is hard to imagine that the present low-tech lecture system, which comes with a big price tag, will survive. Electronic forms of instruction can be provided at dramatically lower cost.

If alternative instructional technologies and credentialing systems can be devised, there will be an out-migration from classic campus-based higher education. A curriculum, once created, could be offered electronically not just to hundreds of students nearby but to tens of thousands around the world.

Already electronic distance education is offered by a wide range of educational agencies. An example is the Agricultural Satellite Network, AgSat, which enables two dozen colleges of agriculture to exchange their course offerings and "reduce duplication." Such efforts at cost reduction are not welcomed by the beneficiaries of low-tech teaching, the faculty, who tend to define the mission and structure of their institutions and are as resistant to change as any self-respecting professionals.

Commercial Alternatives

In any event, the ultimate providers of an electronic curriculum will not be universities but commercial firms. Textbook publishers will establish sophisticated electronic courses, using the most effective and prestigious lecturers. At present, private universities charge a tuition of nearly $50 per lecture hour per student, not counting most of the public and philanthropic support they

Electronics and the Theological School

Only eight of North America's 222 graduate theological schools enroll as many as a thousand students and most are vastly smaller. In a telephone interview, In Trust asked Professor Noam to help us locate these schools in the picture he has developed in this issue. Here are the answers he gave to our questions.

In Trust: How do theological schools fit into the electronic-age scenario you've just sketched for the major university?

Noam: Theological schools are probably less threatened by the electronic revolution than, for example, science faculties. They have always stressed more the personal-mentoring and the peer aspects of education, and share much more a common core. They are less specialized than, say, medicine, so that one is more likely to work with one's colleagues and one's students in the same physical environment than in highly specialized scientific research that favors electronic linkages.

In Trust: From your perspective, what is it that's special about the theology school?

Noam: All universities, and indeed all teaching institutions, originated in theological instruction—in academies and schools created to pass on the traditions and values of society. There were institutions formed five thousand years ago by priests to train new generations of priests, and from these schools came writing, archiving, libraries and scholarly activity—and that, in turn, led organically to universities.

The literature in theology is more long-term oriented than, say, most scientific literature in fields such as computer science or neurobiology. There's something very positive about the idea that somebody's words in the 19th or 18th centuries, or indeed earlier, still can have real meaning, because it suggests that one's writings today will have readers many years from now. I find that very inspiring.

Mentoring and value transmission are a key part of theological education—unlike in engineering and law where much of education is really information transfer. Information can be transmitted electronically, but it is much harder to do this with values.

In Trust: Are there any disabilities that theological school might want to think about?

Noam: In an exploding universe of information, the greatest danger is that everyone gets drowned out, including the voices in schools of theology. That will certainly happen if they do not have a distinctive message. As much as I am an advocate of electronic communications, I think that churches have done a pretty effective job over the centuries establishing a strong interpersonal system of communications. This should not be lightly weakened by an emphasis on technology, as alluring as it is. And I'm saying this as a fan of new communications technology.

receive or the opportunity cost of students' time. With such prices, alternative providers will inevitably enter the field.

Today's students, if they seek prestigious jobs or entry-restricted professions, usually have no choice other than to take the university route. When the universities' gatekeeper control over accreditation and the public's acceptance of alternative credentials weaken, we may well have in the future a "McGraw-Hill University" giving out degrees or certificates, just as today some companies offer in-house degree programs.

Commercial providers will primarily offer mainstream undergraduate and professional education. At the same time, some of the invisible colleges of interlinked specialists will mutate from unmanageable wide-openness into more structured virtual departments that may offer graduate credentials in their area of specialization. Thus the role of the universities will be weakened from that direction, too. Of course, another reason to attend a university is to share in a rite of generational passage into adulthood. This is important, but such experience could be replicated in other ways, and often in more attractive locations and climates.

If universities' dominance over higher education falters, their economic foundation will erode. Most universities will not be able to compensate for tuition losses by gaining more public funding. Yet private donations are likely to decline, if anything, with the reduction in the universities' centrality in research and teaching, and with a more general disillusionment about the ability of higher education to solve society's problems.

Impact on the University

The problems will not be uniform. On the teaching side, the greatest negative impacts will be on mass undergraduate and professional education and on highly specialized and advanced fields. Least affected will be contact-intensive programs such as selective and tutorial-based liberal arts education as well as skill training that requires hands-on instruction and feedback, and small but stable fields of graduate study that are not lucrative for commercial providers.

On the research side of the university, least affected will be fields that do not experience rampant growth and specialization, and where the various researchers share a strong core. Most affected will be highly specialized research, where keeping up-to-the-minute is critical. Research requiring physical proximity of team members and shared equipment may still be located on campus, but the research units involved will connect primarily to other units elsewhere in academia, industry, and government. The university then exists as a sort of office park of semiautonomous units, each a soft-money tub on its own bottom. The administration of universities is then likely to be even more decentralized than today, and run partly from a distance by telecommuting staff and specialized subcontractors.

Future Role of the University

The true question is whether the economic foundation of the present system can be maintained and sustained in the face of the changed flow of information due to electronic communications. It is not research and teaching that will be under pressure—they will be more important than ever—but rather their present main instructional setting, the university system.

True teaching and learning are about more than information. Education is based on mentoring, internalization, identification, role-modeling, guidance, and group activity. In these processes, physical proximity plays an important role. Thus, the strength of the future physical university lies less in pure information and more in college as a community; less in wholesale lecture and more in individual tutorial. In research, the physical university's strength lies in establishing on-campus archipelagos of excellence that benefit from the complementarity of physical proximity. This requires the active management of priorities.

In the *validation* of information, the university will become more important than ever. As the production of information keeps growing, society requires credible screeners of information, and has entrusted some of that function to universities and its resident experts, not to networks. But to shield the credibility of this function requires universities to be vigilant against creeping self-commercialization and self-censorship.

The threats to universities will not emerge overnight. Yet the fundamental forces at work cannot be ignored. In the past, people came to the information, and the information was at the university. In the future, the information will come to the people, wherever they are. What then is the role of the university? Will electronics do to the university what printing did to the medieval cathedral, ending its central role in information transfer? Have we reached the end of the line of a model that goes back to Nineveh, more than two thousand years ago? Can universities self-reform, or must things get much worse first? ·IT·

In the past, people came to the information, and the information was at the university. In the future, the information will come to the people, wherever they are.

Eli M. Noam is professor of finance and economics and director of Columbia Institute for Tele-Information, Graduate School of Business, Columbia University (e-mail address: eli.noam@columbia.edu).
This article has been abridged; it first appeared in Science magazine. Reprinted with permission.