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Telecommunications, Politics, Economics, and National Sovereignty
A New Game*

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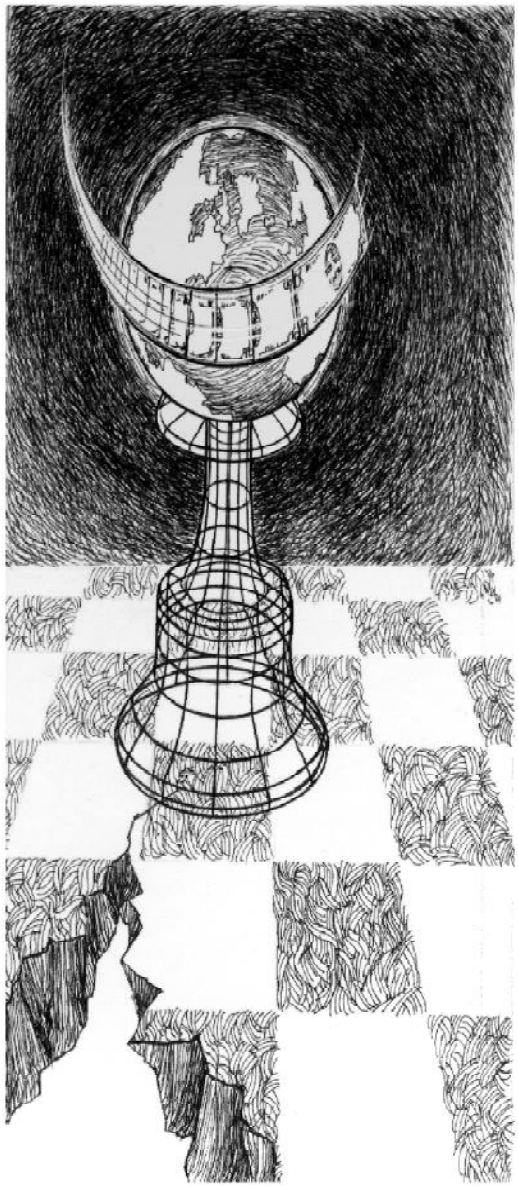

TECHNOLOGY—the societal process for the production and operation of artifacts, both tangible and intangible—impacts virtually every other societal structure and process and is, in turn, influenced by them. From its inception at the early emergence of humans as a distinct species, technology was the instrument that extended our biological capabilities, eventually making possible increasingly large human aggregates. The emergence of a complex sociotechnological system, the *polis* (a Greek word for city-state), gave its name to the process we call politics.

The polis was a territorial entity, and politics to this day remains eminently a territorial phenomenon. In the words of the late Speaker of the House Thomas P. ("Tip") O'Neill, "all politics is local" as it is wedded to the people living in a given geographical region.[1] So is sovereignty itself—the phenomenon defining the sphere of power of an entity, whether it be a polis, a nation, or an empire, or whether it be politically democratic or not. Economics, as an emanation of the polis, also can be viewed as having a territorial substratum. In its broad acception of consideration of costs and returns, however, it becomes a nonterritorial abstraction.

Political power and economic power may operate over the same territory (as in the now rare case of isolated economies) but, more often, their domains do not coincide. The direct or indirect agent of the divergence is technology, the very process that created them and now makes possible global markets, which cross frontiers. When the domains of political and economic powers diverge, inevitably some elements of political territorial sovereignty are lost, while purely economic communities almost inevitably tend to acquire political power that carries with it some elements of sovereignty. Today we are at a very critical moment when technology has greatly accelerated this divergence.

Given human nature, it was inevitable that technology, by its ability to dramatically extend our capabilities, would create an inexhaustible demand for ever greater and more powerful extensions—whatever their purpose—with enormous impacts on politics, economics, and other social processes.

In 1957 the first artificial satellites, circling way above any state's ability to capture or destroy them, forced states to officially concede limits to the extension of their sovereignty in the vertical dimension—a sovereignty that was held to be limitless until then.

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In our consumer society, the ever-expanding appetite for goods andservices made possible by technology has increased the demands on political and economic systems, and on technology itself, to provide sustenance, jobs, and an adequate standard of living. At the same time, it has created demands to remedy and conserve the very environment from which the consumer society draws its resources—hence the bidirectional nature of the interaction of technology and society. Technology offers tantalizing possibilities—not only economic but also political, military, environmental, and so on. In the process, wants are created that the economist and politicians endeavor to satisfy by guiding the allocation of resources and the direction of technology. Those demands can become so large, urgent, and often so irreconcilable as to raise doubts as to the future of the very society that technology made possible and to threaten its stability. Historically, major new technologies, while creating a new universe of opportunities, have almost always raised concerns about future directions of a society. This is very much the case today with telecommunications—or rather with the powerful synergy of telecommunications and information processing that, for the sake of brevity, I shall label "telecommunications."

To put the impact of telecommunications technology in perspective, we need to remind ourselves that our own country was agonizing some 200 years ago not only about how to achieve independence, but also whether the introduction of manufacturing, which was beginning to develop vigorously, would ensure independence and economic and social stability or subvert them. Manufacturing on a diffused scale, as had begun at that time also in England and in part of Europe, was of course traumatic to societies that had been what Walt W. Rostow calls pre-Newtonian.[2] In those societies, innovation had been sporadic in spite of the impact of the new geographical discoveries, which, however, did not penetrate and change fundamentally the agrarian economic life of the interior.

The danger of chaos is real.

Manufacturing created a corps of innovators and effective industrial enterprises, and it caused profound changes in the economy and in the life of towns and villages where the factories were located. The power of manufacturing became clearly evident in the America of the Civil War, in the subsequent construction of modern fleets that enabled the industrial nations to colonize so much of the world, and in the organization of modern land armies that gave sinews to the rapidly rising star of nationalism.

In effect, manufacturing and transportation became the foundation on which the modern nationalistic state could protect and attempt to extend its sovereignty. Even the maritime trade was carried out globally under national flags, protected by fleets of sovereign powers. However, the trade tended to generate in the great urbancities that were its terminals a cosmopolitan culture that clashed—as it also did in the American state legislatures of the post–Revolutionary War period—with more localist cultures from the interior regions.[3] This situation still characterizes, to a remarkable extent, some of the current conflicts in our political views.

If manufacturing was the foundation of the power of the modern nationalistic state, telecommunications, with the ability to cross frontiers and penetrate into the most distant regions of the world, have come to represent the quintessential challenge to territoriality and hence to national sovereignty. This is not a deliberate challenge but a challenge, as pointed out by Walter B. Wriston in pioneering essays,[4] that is intrinsic in the nature of the technology and in the economic and political processes that telecommunications make possible.

From Energy to Information and Complex Systems

The change in the leitmotiv of technology from energy to information, which characterizes so strongly the second half of this century, has been the result of the close interaction of information and telecommunications and of our ability to build and operate very complex systems such as telecommunications networks using satellites, fiber optics, or cellular telephones.

Of course, energy continues to be vital to our biological and economic activities, as well as to defense. The pertinent point here, however, is that energy or energy-driven networks (highways, railroads, airlines, shipping, etc.) are all tangible and require material resources (metal, cement, fuel, etc.) that are bound to increase in cost as demand increases. Virtually immaterial telecommunications, on the other hand, use very limited energy in the conveyance of information and tend to decrease in cost with increasing demand.

Because of its immateriality, the information conveyed by telecommunications is not consumed by use (but competitive advantage is lost if it is accessible to competitors). However, it can suffer from noise and can be degraded during its transmission. Thus, information needs to be maintained, and so do the programs that manipulate it and the data banks in which it may be stored. There is economic value in reducing the degradation of telecommunications (as evident from the publicity of competing telecommunications networks) and in maintaining systems that transmit the information.

Given the intrinsic immateriality of information, telecommunications systems are virtually not territorial, while systems for the production and use of en-

ergy are eminently territorial. For example, while the car user is confined to asystem of roads, the time is approaching when every individual will be potentially addressable anywhere in the world with his or her identification data, bypassing territorial forms of control. Finally, whereas energy flows are one-directional (say from A to B), information can flow in any conceivable direction—from B to A as well as from A to B, creating different values for A and B. That is, information is relative. If we use Claude E. Shannon's definition of information as the removal of uncertainty,[5] it is clear that different individuals may have different uncertainties, so that what is information for one individual may not be for another. Given also the importance—in business, war, diplomacy, the media—of the temporal element of information, that is, of obtaining information ahead of others, we can say that telecommunications enlarge the circle from which we can search and draw information instantaneously. Thus, value is created by telecommunications, and the massive growth of investments in the telecommunications-information sector vis-à-vis the energy sector stems in considerable measure from these factors.

Technology, Telecommunications, and Sovereignty

Sovereignty can be defined in many ways—as autonomy, independence, controlling influence, or, more appropriately in the context of this paper, as a political unit that has supreme authority on anything that happens within its boundaries. However, in the evolution of the modern democratic state, even that supreme authority has limits. There are inherent freedoms of the citizens that not even the supreme authority of the state can abolish, and there are concessionary freedoms acquired by the citizens by concession by the state.[6] Sovereignty implies, therefore, a defining sphere within which it exerts its power. In the case of a nation, that sphere is defined by its borders—although it may extend beyond them (e.g., to the nation's ships).

The imperative for sovereignty is to defend the control within its sphere. Technology has both reinforced and weakened that control. Suffice it to think on the one hand of the powerful weapons that only a central authority with the power of taxation can afford and build and, on the other, of the impact of telecommunications from outside the borders on the former Soviet Union or on Cuba.

We can say, in general, that any technological system that enables people to reach on their own beyond the frontiers of a state, and to carry economic or political activities beyond such frontiers, has an impact on that state's sovereignty. Postal systems, books, trades, and international banking all have had (and have) that effect in various degrees. But with telecommunications and their synergy with information technology, the impacts on sovereignty have become dramatic and are still far from being understood intheir nature and magnitude. All the underpinnings of sovereignty—not only political and economic power, but also the infrastructure that supports them and, more fundamentally, the outlook, values, and mores of citizens—are being transformed by that impact.

Territoriality and Metaterritoriality

A clear understanding of what is territorial—anchored, as it were, to the ground—and what is not is helpful in further clarifying the impact of telecommunications on politics, on economics, and on sovereignty.

Table 1
Examples of Territotial versus Metaterritorial Entities or Activities

Territorial	*Metaterritorial*
Agriculture	Beliefs
Cities	Literature
Manufacturing plants	Information
Ground installation of networks (workstations, offices, etc.)	Science
Other elements of the physcial infrastructure (water, power, railroads, highways, etc.)	Electronic transactions
Schools	Satellites (once launched)
Politics	
Armies	
Scientific laboratories	

Obviously, any process, entity, or structure anchored to the ground is territorial, while virtually any activity of an intangible or abstract nature that can be conveyed as information or transformed into information can be regarded as metaterritorial.

These distinctions are exemplified by table 1. Thus, science as a method, as information, as a system of beliefs, is metaterritorial, like philosophy or literature, but the scientific laboratory is not. (However, through telecommunications, "virtual" scientific laboratories can be created, whereby it is only the interconnectedness of their components situated in different territorial jurisdictions that creates the laboratory—in this sense, a quasi-metaterritorial or potentially metanational entity.) Similarly, software or telephone conversations are metaterritorial; the devices that carry them are not, but their interconnectedness across territorial jurisdictions creates again a metaterritorial system—the "network." Politics, as a set of beliefs and ideas rather than as a practical activity, is also metaterritorial. However, it is so closely wedded to tangible entities—house, factory, infrastructure, military power, and so forth—as to properly represent, as per Tip O'Neill's epigram, the quintessence of territoriality.

The significance of the distinction in the table is at the core of the impact of telecommunications—the key instrument of meta- territoriality—on territorial processes, which, quaterritorial, are the subjects of sovereignty. Specifically, in the context of sovereignty, metaterritoriality applies to a process or entity that cannot be stopped at a border, either materially (as in the case of microwaves or satellites), or for other reasons (such as the high speed and high volume of telecommunications that defy any practical control).

Of course, telecommunications technology did not start with radio. It started with the telegraph and later with telephones (if we neglect the much slower visual communications), but the traditional telephones and telegraph interconnected by wires have an element—the wire—that tangibly crosses national boundaries and thus, in principle, can be more easily controlled. On the otherhand, microwaves are intangible, do not require wires, and are unstoppable except by electronic means of shielding. However, a modern fiber-optic connection, with its enormous bandwidth, is also hard to monitor, and a multiple-path combination of fiber-optic networks and microwaves is even more difficult.

Telecommunications penetrate national borders (and thus, potentially, sovereignty) in many virtually unstoppable ways: by economic, political, cultural, and diplomatic information (e.g., "the age of transparency" brought about by electronic media and by commercial observation satellites).[7] Electronic trading on the stock market and other exchanges; international telemedicine (which now assaults, for example, the concept of national licensure of physicians) ; international joint engineering endeavors; on-line services; and software—all these activities are breaking, in various measures, the walls of traditional territorial sovereignty and, as pointed out by Anne Branscomb in 1991, challenge the laws that govern the ownership and flow of information.[8] They will do so even more in the future, even if nations will constantly try to counteract these trends and to assert and defend their telecommunications sovereignty, for example, by regulating access to airwaves.

Interaction of Telecommunications with Politics and Economics

Table 2
Telephone Protocol
Austria, 1888

OPERATOR IN VIENNA TO OPERATOR IN BADEN

"FRAULEIN OPERATOR IN BADEN?

MIGHT I HAVE THE HONOR TO WISH YOU A GOOD MORNING?

IT IS MY PRIVILEGE TO ESTABLISH A CONNECTION ON BEHALF OF HIS EXCELLENCY, THE PRIVY COUNCILOR ALFONS BARON VON WIECK, WHO PRESENTS HIS COMPLIMENTS

HIS EXCELLENCY WOULD BE GRATEFUL FOR THE PLEASURE OF CONVERSING WITH . . ."

Source: Frederic Morton, *A Nervous Splendor: Vienna 1888/1889* (New York: Penguin Books, 1980), 38-39.

Telecommunications technology is still far from mature. However, it is progressing at such a fast and uncontrollable pace as to leave regulations, institutions, and national sovereignty far behind—trying to back and fill, to use the vernacular. Yet the process is far from autonomous. Politics and law influence it—just as much as it does them. It may be said, for instance, that the monopolistic license that American Telephone and Telegraph (AT&T) enjoyed until not too long ago made Bell Laboratories possible and hence the pioneering advances of American telephony. In turn, economics influences policy. We see this happening today in countries, foremost among them the US and Great Britain, which, under pressure of business interests, including those in telecommunications, have developed the most liberalized telecommunications policies. And, of course, policy influences economics, as is happening today in Sri Lanka, where every factory is obliged to have a fax line—a factor that has facilitated the production of garments and other merchandise for the world market. Politics and economics, however, are not the only processes affected by telecommunications and affecting them. Suffice it to look at how telephone protocols have changed (an extreme case is shown in table 2), or at the ubiquitous use of cellular phones, or at how telecommunications have changed many other social mores.

Some of the principal characteristics of telecommunications (or,more properly, of the synergisms of telecommunications and information) and their economic and political implications are summarized in table 3. The complex challenge that telecommunications represent for national sovereignty stems from the cumulative impact of characteristics such as these.

Telecommunities

A new phenomenon in the impact of telecommunications on national sovereignty is the emergence of a set of incorporeal and potentially powerful communities of interest (they could be called "telecommunities") no longer wedded to geography or contained by national borders. Some key points help underscore the impacts of the telecommunities on traditional national sovereignty:

(1) The telecommunities constitute a new set of entities that, like nations or individual companies or operators, can participate in Ricardo comparative advantage trade-offs. Because of the large number of telecommunities (for example, well over 70,000 networks currently participate in the Internet), the trade-offs can give an enormous impulse to the economy and create a myriad of flexible and highly efficient markets. (To be precise, it is useful to differentiate between network and telecommunity. The network is the physical instrument that makes the telecommunity possible, while a telecommunity is defined by software protocols that may be carried over several networks and by the people who use them to communicate with each other.)

(2) Their power stems from their possession of information and their large number. However, given the ease with which competing communities can be formed, it cannot be a monopolistic power or a power dominated by a central authority.

(3) Their potential high economic power stems from their being focused on specific common interests, thus representing a specialized and self-selected market.

(4) Their potential political impact is exemplified by the very rudimentary telecommunity that helped bring to power Khomeini or, more recently, by the use of fax and E-mail by Mexican insurgents in Chiapas to sensitize public opinion abroad.

(5) They do not, however, possess military power, but it is possible to conceive of situations in which they could have some elements of it (e.g., territorial or military information).

(6) Their potential to define and issue their own information-based "currency," that is, their own units of exchange, can defy or make difficult political and fiscal control and thus weaken one of the key powers of sovereignty. Today's financial products—including new derivatives of all sorts—are but a pale image of what could happen when the potential power of the telecommunities is fully understood and unleashed.

But with telecommunications and their synergy with information technology, the impacts on sovereignty have become dramatic and are still far from being understood in their nature and magnitude.

(7) Although they exclude, intrinsically, the "information-disenfranchised" wherever they may be, if the disenfranchisement can be overcome by expanding access and participation, telecommunications could improve economic conditions faster than traditional aid approaches.

(8) They have, unfortunately, the potential of becoming fertile ground for new kinds of crime—an issue that may induce them to create their own "police" and further assert their own sovereignty.

(9) Because of their ability to potentially encompass members of many nations, and because several of their characteristics are virtually impossible to regulate by international treatises, they can be viewed not as international but as truly metanational communities.

Table 3
Some Key Characteristics and Capabilities of Telecommunications
(Examples Of Their Political and Economic Implications)

Characteristics and Capabilities	*Political Implications*	*Economic Implications*
Speed	Ahead of political decision-making process	Has great competitive value Weakens economic controls that rely on slower human intervention
Volume Capacity	Surfeit of information makes	Large variety of simultaneous transactions possible
Territorial Independence (Microwaves, phones to a lesser extent)	Weakens tactical political power and the exclusivity of diplomacy Makes international "telecommunities" possible	Can bypass traditional controls of currency, trade, etc.
"Capillarity"	Defies central control	Creates person-to-person and producer-to-person markets; weakens or transforms intermediate organziational structures Requires some new structures to discipline and filter traffic for users' convenience
Networking	End of single or simple issue	Economic value in the network qua network (self-selected community of users) Business opportunities in providing services to the network
Potentially limitless numer of networks (User can participate in as many networks as desired)	Necessity to better understand and respond to the multiple interests of electorate	Business opportunities in a network's nodal points
Information	Advantage in knowledge of information acquisition and manipulation Can defy political or central control Can defy taxation	Potential to use information as currency within the network (money-analogous instruments) Potential to create new network currency relation business Competitive advantage of an information orientation and high ground
Energy insignificant (Movement of information requires very little energy	Decreased political importance of energy sources	Economy tilted toward information-based, energy-saving activities
Interactivity (Implicit in networking and other characteristics above)	Demands better political dialogue: the territorial sovereignty must explain itself	Better market feedback; also potential for feed-forward New business and public service opportunities

Table 3 (cont'd)

Characteristics and Capabilities	*Political Implications*	*Economic Implications*
Transparency (In two senses) (1) Ease if eavesdropping (2) Observation satllites	Demand for public affairs to be conducted in the open (trials, diplomacy, etc.)	Need for stronger intellecutual property protection
	Need to safeguard privacy of citizens and sensitive processes	Advantages to the tele-information "hunter-gather"
Encryptionability (Can be coded and decoded; makes networks impenetrable	Antidote to transparency An advantage for organizations	Essential for maintaining economic and business advantage of information
Vulnerability (Susceptible to disruptions)	Necessity to provide safeguards	Necessity to provide safeguards
Nationality and race (for voice) blind	Lessening of prejudice	Wider markets
Make possible high-value added applications	Pressures to allow and encourage commerical applications	Virtually limitless applications
	The question of fair competition	
	The question of fair availability	
Make possible distributed memories and data banks	Networks may posses better data banks than territorial power--including acces to and use of international data banks intrinsic in a network	New business opportunities and competitive instruments
Make possible changes in: (1) population distribution (2) workplace imperatives (territoriality of workplace and physical presence) (3) transportation (4) energy consumption patterns	Changes the territorial bases of politics Creates new and different political demands	Changes in business (1) territorial imperatives (2) environmental impact (3) inventory and supply policies (e.g., just in time)
Make possible fundamental changes in delivery of other services: (1) health care (2) education (3) other	New political demands New transterritorial restructuring of services (including universities)	New business opportunities (e.g., telemedicine, private teledidactics, and home-focused services)
Make possible new criminal opportunities (tele-infocrime)	New legislation and other political safeguards	Business must develop new safeguards
	New enforcement of justice	New business opportunities
Make it possible to think of hyperintelligence (global social intelligence)	The ultimate challenge to traditional territorial sovereignty: new models of political systems to respond to new global imperatives	New tasks and responsibilities of business Growth of new, global business ethics

For sure, many telecommunities will be totally within national boundaries and thus will not press hard on the concept of sovereignty. But other communities, in growing numbers, will be truly metanational.

(10) They are governed by new imperatives. The cardinal ones are connectedness, access, speed, security, and the possession of information (to the point that a meaningful parameter of their power would be some quantified index of that information and its value).

(11) Because of their reach, and of the new imperatives that govern them, telecommunities will increasingly shake up and rearrange traditional economic and financial institutions and, in so doing, contribute significantly to the weakening or redefining of national sovereignty. While some traditional institutions such as banks have greatly benefited and acquired greater power from telecommunications, a host of new players is coming to the fore, such as telecommunications companies invading the domain of traditional financial institutions. These new players are intrinsically much more at ease with metanational operations and with the technology of which they are indeed often the source.

(12) With their rapidly forming and reforming, telecommunities offer the opportunity to create instruments to span several of them—again, instruments requiring speed, security, and so forth, as well as possessing some characteristics akin to international compacts, albeit by necessity much more flexible. It will be possible, for instance, to identify and assemble new telecommunities to almost instantaneously extract from them pertinent information (e.g., on their education, industry, trade, or capital availability) to create telebanks and other forms of telebusiness to serve them. A fierce competition of global dimensions can be expected in identifying these communities, finding value in them, nestling and combining them, working effectively with them, finding ways of coordinating within oracross them on matters such as finance, industry, entrepreneurship, and so on.

(13) Telecommunities will also lead to the creation of new professions, new services, and new jobs in the coordination of components of a telecommunity, in the identification of telecommunities and of the competitive advantage they may offer, in new kinds of selling, trading, and manufacturing, and in new ways of manipulating and using information.

(14) The telecommunities will require controls—new compacts, for example, about honesty in trade and/or about provisions for the have-nots. At the same time, those compacts cannot afford to neglect the fact that the members of the telecommunities are real and occupy a certain physical and geographical space. Thus, the compact needs to consider the geographical base of the telecommunities, the infrastructure of services that supports that base (telecommunications facilities, population, transportation, food, and health care services, schooling, and so forth) and therefore territorial politics and economics.

In brief, telecommunications and telecommunities confront national sovereignty with major challenges because of their unimpedible cross-boundary flows (of information), their integrating power (the power to create new metanational entities), and the challenges and opportunities they present to the political process, to economics, and indeed to the entire fabric of society. The national state has only a limited ability to control these intrinsic and at times potentially destabilizing powers of telecommunications and the telecommunities they make possible. We have seen, for instance, that international telecommunication networks have distributed ideas to secluded Islamic women, contributing to declines in fertility in Turkey, Indonesia, Kuwait, and Jordan.[9] We have also seen the frustration of political bodies, such as the US Senate, in attempting to address the problem of how to limit access to pornography on the Internet. In global financial markets, all it takes is a phone call to send large amounts of money across the border or back. This, of course, has contributed to the recent pesos crisis—the ability of short-term investors to remove instantaneously their investments from Mexico.

Further-on Telecommunities

The complexity of telecommunities can be extreme if we just consider a taxonomy based on their relation to national boundaries. Thus, there is an obvious distinction between telecommunities within a national boundary—for example, Internal Revenue Service (IRS) taxpayers or ex-servicemen, and telecommunities crossing such a boundary (e.g., chess players). A primarily national telecommunity may, however, encompass, without losing its nationalcharacter, members beyond the border, such as taxpayers residing abroad.

Although today the largest number of people interconnected via telephones, modems, and telecommunications reside in the United States, there will be a rapid if not uniform global growth of telecommunications so that border-crossing telecommunities become much more dominant, both in numbers and complexity. It is worth reemphasizing that a telecommunity, particularly one crossing borders, does not coincide necessarily with a single telecommunication network. It may bring together members that utilize a variety of networks often based in many nations and that can be connected through a variety of alternate paths. This will make highly desirable those technologies that can find automatically the best paths (however specified, for example, in terms of speed, or cost, or quality of service) to interconnect the members of a telecommunity.

Can national or international authorities monitor and control the activities of a telecommunity? The answer is, only up to a point. Although telecommunica-

tions technology itself can help the monitoring and control process, there are at least two fundamental impediments.

The first stems from the cybernetic considerations that the intelligent regulation of a process requires a model of the same degree of complexity as the process itself. Thus, the complexity required by a model of tens of thousands and, potentially, even more numerous intersecting and interacting telecommunities is enormous, just as enormous in complexity as a model of a very simple brain. The second impediment is that a surfeit of controls can strangle the system.

Thus, effective control of the telecommunities is virtually impossible. Reliance must be placed on voluntary monitoring by the telecommunities, and legal instruments need to be devised that are appropriate to this new situation. For instance, formal or informal covenants that may be created within the telecommunities would tend to bypass or defy traditional trading controls and safeguards, but ultimately the results of transactions within a telecommunity will need to "come to earth" at some end point—in other words, be reterritorialized using, for example, certificates recognizable by a territorial sovereignty (what can be called "end-point regulation").

The Issue of Global Stability

As many traditional aspects of sovereignty are being weakened by telecommunications and as the intense dynamics of the networks and the expansion of telecommunities revolutionize business and politics, there is a need to prevent the situation from becomingchaotic and uncontrollable rather than being one of enhanced opportunities. The danger of chaos is real. To counteract it will require focusing on a more flexible conception of sovereignty, one that preserves essential controls and continues to provide those elements of the territorial infrastructure that are indispensable to the civilized life and defense of the people, while still making possible the full range of opportunities offered by telecommunications. This is the essential duality that needs to be addressed because out of it will emerge the global civilization of the next century. (It is tempting to say, to imitate Voltaire's turn of phrase, that if sovereignty did not exist, it would be necessary to invent it. It is clear, however, that the invention must be one of a new conception of sovereignty.)

The instruments of the new sovereignty can include controls of the territorial elements of the networks (land stations, management offices, and devices), as well as the users of the networks—the persons, qua physical and hence, territorial entities. A new legal and fiscal vision and framework are needed to deal adequately with the new conception of sovereignty in the presence of powerful and ubiquitous metaterritorial entities. The imperative for that sovereignty is to be conscious of its limitations (but also opportunities) in a situation of enhanced international mobility made possible by telecommunications.

An example of that mobility is the rapidity with which financial transactions can be carried out across borders, a mobility that makes it imperative, for instance, for a state and the world community to find ways of bridging the gap between long-term investment needs and short-term money. There is truly a new highly mobile "world order" of finance in which money can move instantaneously across the globe. International "just in time" money is possible, and destabilizing flows in one direction need to be compensated by stabilizing flows in the opposite direction. At this moment, as in the Mexican example, the destabilizing flows can be immediate and beyond the power of national sovereignty, while the stabilizing flows by and large are made possible by national decisions (acting either directly or mediately through international organizations). Reaching these decisions can be very slow, but once reached, they can again be acted upon instantaneously through telecommunications.

However territorial sovereignty may be modified by the far-ranging impact of metaterritorial networks, one of its key responsibilities will be to evolve policies that enhance the state's attractiveness for the territorial elements of the telecommunications infrastructure. Another key responsibility will be to address the issues of ethics and morality in the new telecommunicationsenvironment. Basically, these involve both the impact of telecommunications on the traditional processes that take place under the aegis of a territorial sovereignty and the new ethical rules that should govern participation in telecommunities and the use of networks (e.g., new business ethics, new ethics of personal interactions in a network, and possible limits to self-expression). Congressional concern about network pornography is but one small example of how fundamental and urgent these issues are becoming.

Conclusions

With their digitalization, indissoluble connection to information processing, satellites, fiber optics, and so on, telecommunications will be an inexhaustible source of change for social mores, economics, and politics. Global telecommunications will make information ever more the key strategic ingredient for business and industry, causing an accelerated value migration to information-based business, making possible the creation of myriads of telecommunities, and bringing us closer to perfect markets. Politics, in turn, will have to resolve conflicts between micro- and macro-optimality—between regional interests and those of new global markets and communities of interest—and between the traditional domain of national sovereignty and the pressures of new realities, new ways of doing

business, and new social demands that transcend national boundaries.

The impact of telecommunications on politics, economics, and national sovereignty is creating a new game. It is a game with a new playing field, new rules, new players, new rewards, new impacts on the players and all of society, new ways of cheating, new needs to control it and keep it honest, new potential conflicts, new potential inventions and opportunities, and new potential disasters. That game has engulfed us much before we were able to fathom it in its complexities and impacts and to prepare ourselves for it.

The societal imperative is to accept the reality of this new game and to draw intelligently on the tight interlocking of telecommunications, politics, and economics so as to find a productive balance between territorial sovereignty and processes on the one hand and the new metaterritoriality brought about by telecommunications. This demands the creation of new skills and new understandings, which need to include:

• A deeper understanding of the new economic and financial meaning of international telecommunities and of an information-based global economy.

• The development of a new meaning and practice of politics in an age of global telecommunications and of telecommunities.

• The creation of a new science and a new diplomacy ofterritorial-metaterritorial relations that must emerge from the recognition of the power and importance of telecommunities.

• The development of protocols for interactions in a web of telecommunities—particularly a web of global dimensions.

• The development of a clearer understanding of the impact of territorial-metaterritorial trade-offs on our private lives.

• The ecological implications and global sustainability of economies and political systems with telecommunications and information as their leitmotiv.

• The need to be alert to the possibility of the onset of chaos in the new and complex ensemble of telecommunities and in their relation to traditional territorial powers, as well as the need to understand how to avoid or control it—a political and economic imperative.

As a start, there needs to be the development of a a new and broad sociotechnological research agenda with the ultimate purpose of providing society with the tools to play the new game and thrive.

Notes

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