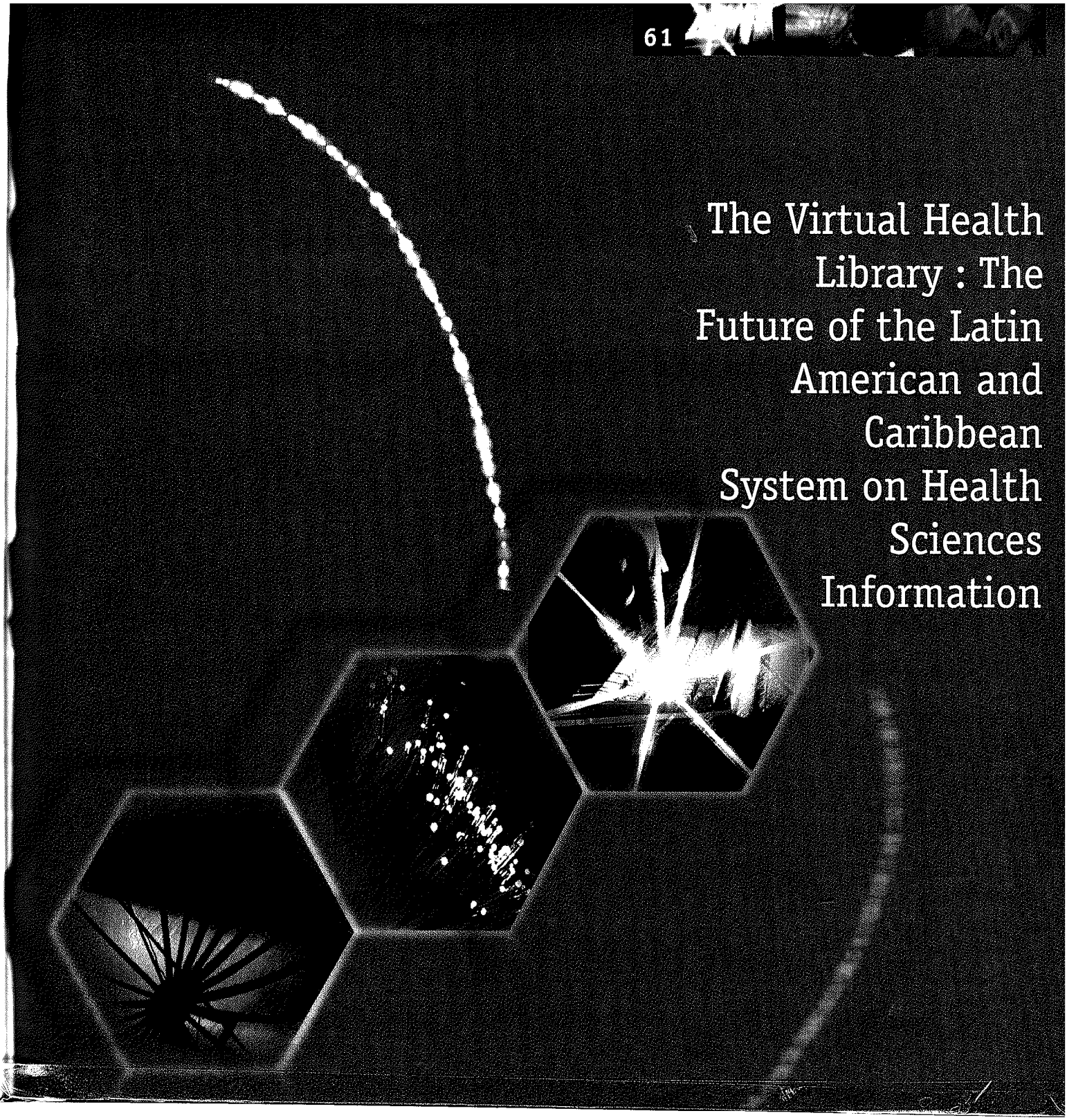
The Virtual Health Library : The Future of the Latin American and Caribbean System on Health Sciences Information



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"Without ideals progress would be inconceivable.... Humankind does not reach as far as idealists would want, but it always goes beyond where it would have without their effort."

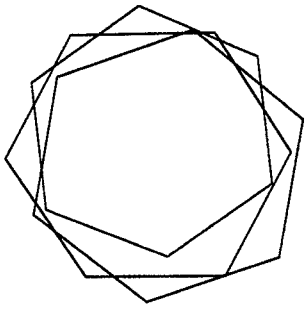
José Ingenieros *(The mediocre man)*

Information and Society

The concepts ***information, knowledge, and technology*** are fundamental elements for establishing the framework for the discussion on the potential possibilities of the Virtual Health Library .

According to Porat, ***information*** refers to data that have been organized and communicated.[2] On the other hand, by ***knowledge,*** we understand the set of organized assertions about facts or ideas, presented through a reasoned judgment or an experimental result, which is transmitted to others by means of a systematic form of communication. ***Technology*** is the use of scientific knowledge for doing things in a specific manner that can be reproduced.[3]

For example, the assertion 'the speed of light = c = 300,000 km/second' is a piece of information. Meanwhile, $E = mc^2$", although it can be communicated as an organized datum, and therefore is in itself information, also represents a complex set of reasonings about the nature of the world which implies knowledge as a mental representation of the interrelation-



[1] *Text based on a presentation to the IV Pan-American Congress on Health Science Information, San Jose, Costa Rica, March 1998*
[2] *M. Porat, The information economy: definitions and measurement, 1977*
[3] *D Bell, The coming of post-industrial society: a venture in social forecasting, 1973*

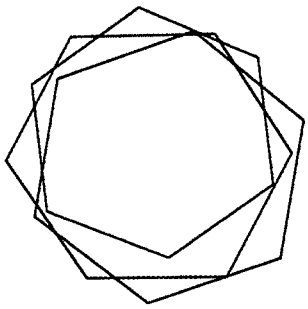
ship between mass, energy, and the speed of light. On the other hand, the design and explosion of a nuclear artifact over the city of Hiroshima, repeated after a few days in Nagasaki, and many more times to this day, is clearly a singular example of technology based on the knowledge contained in that simple and elegant Einsteinian formulation.

Another fundamental concept to understand the characteristics of scientific and technical health information in the new millennium is that of ***globalization***. By this process, the decisive activities in a given scope of action (economy, media, technology, environmental management, and organized crime) function as a unit in real time in the whole planet.[4] It is a historically new process, different from internationalization and from the existence of a world economy, because it is only in the last decade that a technological system has been constituted (telecommunications, interactive information systems, high-speed transportation for people and goods) that can make said globalization possible. The ***Informationalization of society***, *based on the technological revolution that has become the new operational paradigm in the 1970s, is the basis of the economic globalization.*

According to Castells, the ***development modes*** are the technological forms by which work is applied to matter in order to generate the product, thus, determining in the final analysis the level and quality of the economic surplus[5]. Each development mode is defined by the fundamental element in promoting the process productivity, that is, the technological produc-

[4] Castells, M. Hacia el Estado Red: Globalización económica e instituciones políticas en la era de la información, Sociedad y Reforma del Estado, Sao Paulo, 1998
[5] Castells, The rise of the network society,.p.16.

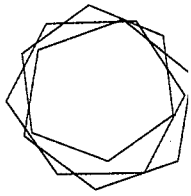
tivity factor. In the case of the ***agrarian mode*** of development, these factors are labor and natural resources, especially the land. In the ***industrial mode*** of development, production and decentralized distribution of energy make up these factors. In the emerging ***informational mode*** of development *the source of productivity lies in the technology for generating knowledge, data processing and communication of symbols.* Knowledge and information are critical elements in all the development modes, since every productive process requires some level of knowledge and information processing. However, the specificity of the informational mode consists in that the principal source of productivity is the action of knowledge on knowledge itself. In other words, information processing basically addresses the improvement of information processing technology as a productivity source, thus, generating a virtuous circle of interaction between knowledge as a source of technology, and the application of this technology to improve knowledge generation and information processing. Each development mode is based on a performance principle that links and organizes the technological processes; in the case of industrialism, this principle is economic growth, that is, maximization of output. In informationalism, this principle is technological development, that is, it is oriented toward the accumulation of knowledge and higher levels of complexity in information processing.



According to Freeman,

> *"The contemporary change of paradigm may be seen as a shift from a technology based primarily on cheap inputs of energy to one predominantly based on* ***cheap inputs of information derived from advances in microelectronics and telecommunications technology."*** [6]

This new informational technologic paradigm has in turn certain key characteristics that are crucial for understanding the potential of scientific and technical information networks in general, and particularly in health:



1. The raw material is the information itself since the technologies act on the information, not just the information on the technology.

2. Its effects permeate the totality of individual and collective existence. Since information is an integral part of every human activity, all aspects of individual and collective existence are affected by the new technological means.

3. Its logic and morphology is that of the network, since this is the structural configuration that best adapts to the growing complexity of the interactions and the unpredictable patterns that arise from these. On the other hand, the network configuration is feasible only through the development and application of the new informational technologies.

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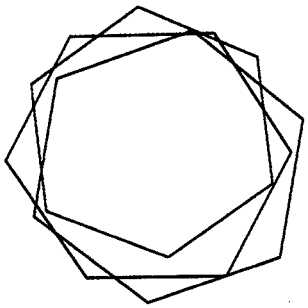
[6] Freeman, Christopher, Technical change and economic theory, London, Pinter, 1988, p.10.

4. It is flexible: the processes, organizations and even institutions are reversible and can be reconfigured, through the reorganization of its components. This capacity to be reconfigured is a decisive feature in a society characterized by constant change and organizational fluidity.

5. Finally, another characteristic of this technological revolution is the convergence of the specific technologies in highly integrated systems, in which the previous technological trajectories become indistinguishable: microelectronics, telecommunications, information science, and even biotechnology articulate themselves increasingly in unique and comprehensive processes of information processing.

Finally, as advised by Castells, the predominant mode of development at every given time shapes all social behavior, disseminating its forms among the set of relations and social structures, penetrating and modifying the exercise of power and of experience. In the case of the new informational mode, this interrelationship reaches even deeper:

> *"Because informationalism is based on the technology of knowledge and information, there is a specially close link between culture and productive forces, between spirit and matter in the informational mode of development. It follows that we should expect the emergence of historically new forms of social interaction, social control and social change.....**For the first time in history, the human mind is a direct productive force, not just a decisive element of the production system."*** [7]

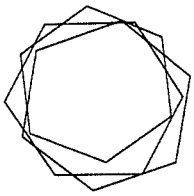


[7] Castells, The Rise of..., P. 18

Scientific and Technical Information in Health (STIH) and the role of the Pan American Health Organization

The vocation to be an instrument for the dissemination of scientific and technical health information has been a mandate from the Pan American Health Organization from its inception. In the Pan American Sanitary Code, signed by the governments of the Hemisphere in 1924 it was stated that:

> *(The Pan American Sanitary Bureau it will be) "...the general center of collection and distribution of sanitary reports for the countries of Americas.... and should ....provide the health authorities of the Signatory Governments, by means of its publications or otherwise adequate means, all the available reports related to the true state of communicable diseases in man, the progress achieved in the control or extermination of the same, the new methods utilized in order to combat disease, morbidity and mortality statistics, the organization and management of public health, the progress carried out in any of the branches of preventive medicine and other reports related to sanitation and public health."*

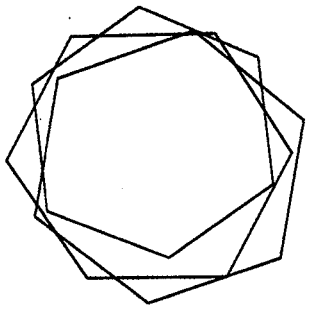


At present, the Organization manages two types of health information in carrying out its task of technical cooperation in health with the member countries: the information on *health conditions* and the *scientific and technical information in health* (STIH) of importance for the countries. In compliance with its mission, the first Bulletin of the Pan American Sani-

tary Bureau, the oldest continuously published public health journal in the Americas, was issued in 1926. In addition the Organization periodically produces numerous publications and reports on the health conditions of the countries of the Americas.

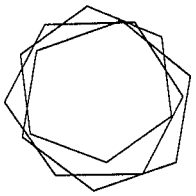
This task of "collecting and disseminating" sanitary publications of the Region was strengthened since 1967 when, through agreement between the Government of Brazil and PAHO, the Regional Library of Medicine (BIREME) was created. In 1982, it became the Latin American and Caribbean Center on Health Sciences Information. The mission of BIREME consists in being the Specialized Center of the Pan American Health Organization responsible for:

- The dissemination of *STIH* among the health workers of the Region
- The processing of public health and medical literature produced in the countries of the Region
- The articulation of the regional system with other large systems of STIH
- The coordination of the national networks and regional network of STIH that constitute the **Latin American and Caribbean System on Health Sciences Information.**



Toward the Virtual Health Library (VHL)

In BIREME's first period action focused on the operation of the regional medical library with a view to responding primarily to the needs for access to the scientific literature of the medical libraries of the Region. Starting in 1977, the action of BIREME was oriented toward the creation and development of the network of libraries in the Region in search of the rationalization of resources and the shared use of its collections, and the bibliographic indexing of Latin American journals under the publication of the Latin American Index Medicus. In the last ten years BIREME has led the creation and development of the Latin American and Caribbean System on Health Sciences Information, the creation and dissemination of the LILACS methodology for the decentralized treatment of scientific literature, the creation of the Descriptors in Health Sciences (DeCS) in three languages, the launching of LILACS in CD-ROM and the promotion of the formation and development of scientific and technical information systems specialized in several priority public health areas in the Region. In the decade of the 1990s BIREME connected with the Internet and organized four Regional Congresses in Information in Health Sciences with the massive participation of professionals of health information of all the Hemisphere and of Europe, which has contributed to an extraordinary exchange of information and experiences.



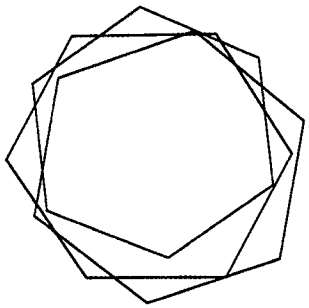
At present, the countries of the Region, immersed in the process of paradigmatic change described in the previous section, require a new type of

technical cooperation that could lead to the creation and operation of decentralized sources of information through the Internet, broader in their scope and with multimedia support, with added value to serve needs of specific groups of users, with less mediation and through interfaces that facilitate the direct interaction of the users with the sources of information.

In this new paradigm, the strategy of dissemination of STIH in the Region should be based on the following principles:

- To be constructed on already existing structures
- Aimed at filling the needs of all the health workers, not only of academicians or `investigators`
- Constructed on cooperative networks
- Decentralized with universal scope
- Compatible with the systems already existing in the Region
- Accessible by all the possible and necessary means, according to the context of every user and every country
- With useful information for the user.[8]....

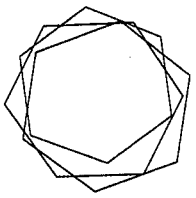
The recent external evaluation of BIREME carried out in 1997 recommended ratifying the key role of BIREME and of the Latin American and Caribbean System for the dissemination of STIH in the Region and strengthening



[8] The definition **of Health Information Usefulness** is given by the following formula:
***U = R x V / D**, where*
***U** = Usefulness of the Information*
R = Relevance (as measured by the frecuency in which the user confronts the problem or topic)
V = Validity (the probability of accuracy of the information)
***D** = Difficulty measured in time and effort required to find the information*

the regional network through the increased participation of the national systems in its development. In addition it was proposed to reorient the task of BIREME toward technical cooperation with the national networks and the regional network, proposing as the regional goal the construction of the ***Virtual Health Library (VHL).***

The essential concept of the VHL is based on the new informational technological paradigm, with the decentralized production and management of textual and multimedia health science information sources, connected in networks with direct and universal access, without geographical nor time limitations, as a distributed base of scientific and technical health information which is registered, organized, and stored in electronic format in the countries of the Region, being universally accessible and compatible with other international information bases.



The Latin American and Caribbean System on Health Sciences Information and BIREME face daunting immediate tasks in order to convert this futuristic proposal into a reality. Among them it is to strengthen the technical cooperation function in support of the development of the Network and of the VHL, to coordinate the cooperative production of information databases and services, the research and development of information technologies, and the mobilization of human, institutional, and financial resources for the development and support of the proposal. In this regard, at the recent *Summit II of the Americas,* held in Santiago, Chile, the leaders of the countries of the Region established the greatest priority in health for initiatives such as the VHL upon declaring:

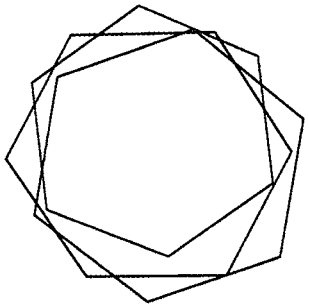
"The Governments will strengthen and improve the national and regional networks of health information....will develop, implement and evaluate, according to needs, health information systems and technologies including telecommunications, support for epidemiological surveillance, the operation and administration of health programs and services, health education and health promotion, telemedicine, computer networks and investment in new health technologies."

Conclusion

According to Kranzberg, the relation between technology, and society is expressed by **Kranzberg's First Law :**

"Technology is neither good nor bad, nor neutral."[9]

This aphorism is an expression of the ambiguous strength with which the new technological paradigm of development will insert itself in the total range of our social practice. Nevertheless, however unremitting, it is also a process that can be conducted and managed by conscious social will, and as such, it corresponds to each of us to exercise, as individuals as well as collectively, our participation in the development of the new model.



For those of us who work in the field of health and the human development in Latin America and the Caribbean, the construction of the Virtual

[9] Kranzberg, The Information age: evolution or revolution?, in Bruce R. Guile (ed), Information Technologies and Social Transformation, Washington D.C., National Academy of Engineering, 1985.

Health Library constitutes a conscious and necessary social action so that the health workers and the people of the Region can benefit from the new opportunities that this new informacional world can offer us. The step into a new millennium and a new model of social interaction is a challenge from which we cannot retreat. Upon assuming the commitment to make the Virtual Health Library a reality, the Pan American Health Organization and its member countries have displayed a visionary vocation similar to that which inspired the inception of the Organization nearly a century ago. By facing the challenge of adapting the new informational technologies to serve the needs and demands of the people of the Americas, the countries of the Region have commenced a new century of sanitary Pan Americanism, and have renewed their commitment for human development based on the value of the health as an irreplaceable element of a more equitable and just America, with Health for All and With All.