NOTES FOR REMARKS

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I'm grateful to the EIC for its decision to dedicate this program to development and for the opportunity to talk about the role of science and technology in developing countries as seen from the perspective of IDRC. I've accepted the Chairman's suggestion that the format be one of show and tell—actually tell and show because the film I have with me will be screened after my remarks.

I'd like to say something about scientific research, something about IDRC and—because of the specific references to the new technologies in the communique from the Versailles Summit 10 days ago, something about that subject in particular.

I'll begin with the proposition that of the many factors which permit a society to contribute to the welfare of its peoples and to enhance their standard of living, the ability to identify and solve problems is surely central. Neither the presence of resources nor the discipline of a population will suffice should there not be an indigenous competence to understand the elements of one's surroundings and to address the problems encountered. This competence is a research competence.
So fundamental have been the contributions of scientists to the societies of Europe and North America that the names of many are household terms. Lavoisier and Celsius are two such from the 18th Century; Ampère, Kelvin, Pasteur, Darwin and Doppler are but a few of the extraordinary number of 19th Century scientists whose accomplishments have contributed so much to our standard of living. A 20th Century list would be so long as to be unmanageable. This tradition of enquiry, of investigation, and of solution is well entrenched in the industrialized countries but until recently has been all but absent in the developing nations. The extent of the deficiency gained international attention in 1963 at the United Nations Conference on the Application of Science and Technology for the Benefit of Less Developed Areas. It was referred to later, in 1969, by the World Bank Commission chaired by the late Lester Pearson and many times since in important United Nations fora.

The Pearson Commission estimated that of all scientific and technological activity carried out worldwide, 3% at most was undertaken within the developing countries. Even then, it was reported, much of the research in those places was irrelevant, unnecessary, or even inconsistent with the needs of
the countries themselves. A sector of particular concern was agriculture. Little more than a decade ago almost no biological research was pursued in the food crops of the newly independent countries. The research undertaken - some of it of a very high standard - was concentrated almost entirely in the cash or plantation crop sector: coffee, cocoa, bananas, sugar, groundnuts, rubber. Next to nothing, tragically, in the food, or consumption crop, fields: cassava, chick-peas, quinoa, plantain. Indeed, any serious work on such tropical and sub-tropical staples as rice, sorghum and maize concentrated on circumstances pertinent to the soil and climatic conditions in Europe, North America or Japan, not those in the south.

Responsibility for a portion of this absence of local competence lies with the basic principles of the colonial system. Decisions with respect to the location of universities or research stations, design of R&D programmes, employment of resources and the like, were generally taken with the broadest interests of empire - or, later, multinational corporations - in mind. Yet some responsibility lies as well with the model of development that we in the north, in innocence and good conscience, project to the south. Capital-intensive, energy-
inefficient, and often high-technology responses are offered as the norm. Physicians are trained in our universities in circumstances that make them incapable of practising their profession without the support of a host of diagnostic and curative paraphernalia. All too-seldom do we pause to reflect that few technologies are transferable without careful study and adaptive preparation.

Yet many of the difficulties faced by the developing countries, and the destabilizing effects that are increasingly felt by all members of the international community, can only be overcome by the application of science and technology. That application, to be effective, must be responsive to local cultural and social sensitivities, be relevant to local problems, and bring with it self-sustaining solutions. These can be achieved only if an indigenous scientific capacity is present to identify problems, engage in research, design solutions, and determine policies. In the absence of that national capacity, of that native competence, economic disparities widen, environmental degradation worsens, political instability spreads, and human dignity suffers.
The role of IDRC is to strengthen that national capacity, that native competence. We do so by supporting research projects within the developing countries themselves.

Créé en 1970 par le Parlement, le Centre a été mis sur pied pour apporter une réponse à un besoin évident des pays en développement. C'est un organisme indépendant vis-à-vis du gouvernement canadien - bien qu'il soit financé entièrement par le Parlement - et sa mission est d'encourager et de subventionner des recherches scientifiques menées dans l'intérêt des pays en développement. Un des objets dominants de la plupart des projets financés par le CRDI consiste à former dans ces pays d'excellents chercheurs autochtones. Les recherches sont proposées, élaborées, dirigées et réalisées par des chercheurs des pays en développement en fonction de leurs propres priorités. Dans leur grande majorité, les recherches financées par le CRDI visent à améliorer la qualité de la vie chez les ruraux qui, même s'ils constituent les trois quarts de la population des pays en développement, sont souvent les derniers à profiter des progrès de la science et de la technique. L'orientation et les politiques du Centre sont établies par un Conseil de gouverneurs de composition internationale, qui

Les gouverneurs canadiens sont eux aussi des hommes et des femmes éminents. On relève parmi ces derniers des noms aussi connus que, par exemple, Bill Winegard, Fred Bentley, Maurice LeClair and David Lawless.

In addition to the direct support of research, one example of which will be shown in the film, IDRC offers help to developing country research institutions for the organization of their research materials; for the design of storage and retrieval systems. At Versailles, President Mitterand suggested
to the other leaders that one of the means by which the developing countries should be assisted is in the realm of knowledge or information transfer. IDRC's experience in the information sciences gives us a special responsibility.

The Centre's Information Sciences Division has concentrated its efforts in two main areas: supporting data base development (international information systems such as AGRIS, DEVSIS, etc.) and supporting specialized information analysis centres.

With the rapid growth of telematics in the eighties, that is the marriage of the computer and telecommunication technologies, we realize that we must address - on behalf of developing countries - the use of non-traditional techniques of information transfer. One of these techniques is called computer conferencing. Computer conferencing uses the storage, retrieval, and processing capabilities of the computer along with low-cost, high-speed, digital telecommunication technologies to facilitate communication among any number of geographically dispersed individuals and communities. Instead of attending a
conference in person, talking and listening, one participates in a computer conference by typing and reading from a computer terminal at a time and location of one's own choice.

As these new technologies become utilized more and more in the industrialized world, the fear exists that Third World institutions will be left out of the design and implementation of and participation in the rapidly expanding networks. In order to explore the state of the art and receive advice on any potential role for us to play, IDRC convened a week-long workshop last October where the opportunities and pitfalls for developing countries were discussed. It is perhaps indicative of the need for this workshop that only isolated pockets of current activity in this field could be found in developing countries.

The fact that computer conferencing is an asynchronous form of communication distinguishes it from other media. This characteristic removes problems relating to communicating across time zones, allows more efficient utilization of time by eliminating telephone tag and by permitting individuals to participate in "conferences" while carrying out one's regular responsibilities, and offers the opportunity to transmit information at the least expensive rates. In addition, individuals
can: participate in the 'plenary' sessions of a computer conference while engaging simultaneously in "corridor chatter" with other participants; participate in as many ongoing conferences as desired; obtain reactions to a paper or proposal from a large community of individuals in days instead of weeks or months using conventional means; be located in the field collecting information and providing advice while maintaining contacts with peers at other locations; remain close to one's data sources thus ensuring greater accuracy in communications. The net effect is that the individual and group can comfortably undertake more activities, monitor more information sources, and do these things with far greater efficiency.

Of course, there are disadvantages. The most obvious one is the possibility of technical failure, but this is not true only for computer conferencing systems. Considerable information overload can occur through the opening up of a new wealth of contacts and information sources. For some, the risk exists that the computer legitimizes incorrect information.
Computer conferences can act as a complement to, and in some instances replacement for, face to face meetings. With travel costs rising and the need for contact among scientific researchers ever increasing, the benefits of alternative, less expensive and more efficient forms of communication will increase as well. The possibility for a scientist in Addis Ababa to be able to be in daily contact with his peers in the rest of the world is an appealing prospect as an alternative to a six to eight week turnaround by mail. Similarly, computer conferencing could allow junior researchers from Third World institutions to participate regularly in conferences in their discipline whereas now only limited participation in international conference is possible, and usually only for senior staff. These contacts must be nurtured for scientific research to flourish.

The telecommunication technology required to support computer conferencing is now in place, or will be shortly, in many parts of the world. Even for the most inaccessible, poorest regions of the globe the technical solutions to communication problems exist but presently may not be practical to implement due to a poor cost/benefit relationship and/or the
lack of the setting of a higher priority by decision makers. The experts at our meeting were unanimous in stating that the greatest impediment to the implementation of international computer conferencing systems will be of the legal and regulatory nature rather than technical. In many countries, national telecommunications companies will not look kindly at inexpensive digital communication competing with the lucrative traditional communication monopolies they now manage. The compensating national benefits of allowing improved scientific communication need to be emphasized to these corporations.

It was the consensus of the meeting that these systems will be an integral part of the available communication options in the coming decade and that unless the developing nations can participate in this electronic community of science and technology they will suffer from a disenfranchisement of a serious nature. To that end they drew up a set of twelve recommendations. IDRC will do its best to ensure that these are heeded by the Versailles summit follow-up commission as it examines the new technologies in their broader aspects.
Already we are preparing for a regional workshop in Lima and a policy study is underway in Mexico and Brazil. We are exploring the possibilities of the employment of these systems for improving communication among the several international agricultural research centres for facilitating medical education in Nigeria by linking a Nigerian university medical school with one in Canada and for supporting cooperative international research in the field of biotechnology.

In this particular sector of the Information Sciences, IDRC is pursuing its mandate of increasing Third World scientific institutional capacity and research competence just as it does in other sectors such as the agricultural, health and social sciences. The film that follows is illustrative of a single research project, but one whose results are attracting broad attention and emulation.