International Council for Science
Conseil International pour la Science

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To: The WIPO International Bureau, Governments, and Organizations Participating in the WIPO Survey on Intellectual Property in Databases

From: ICSU Group on Data and Information
Subject: Responses to Analytic Table of Questions Raised at the WIPO Information Meeting on Intellectual Property in Databases

Attached please find a copy of the responses to the questions raised in the WIPO doc. DB/IM/7, Nov. 18, 1997, on behalf of the International Council of Scientific Unions (ICSU). The issue of a new form of sui generis intellectual property protection for the contents of databases is a critical one for ICSU and the international scientific and educational community. ICSU is concerned since data are the lifeblood of science. As is pointed out in this document, scientists are both users and producers of databases. In the course of their research, scientists frequently draw on existing databases from which they create a new databases to meet their research objectives. The synthesis of data from different sources in order to provide new insights and advance our understanding of nature is an essential part of the scientific process.

I hope you will find the time to study this paper. Comments on the issues raised in this paper are welcome. Please send them to:

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INTERNATIONAL COUNCIL FOR SCIENCE (ICSU)

Responses to

ANALYTIC TABLE OF QUESTIONS RAISED AT W.I.P.O. INFORMATION MEETING ON INTELLECTUAL PROPERTY IN DATABASES

(Geneva, 17-19 September, 1997)

Prepared by
ICSU/CODATA Group on Data and Information

Responses to WIPO Survey on Database Protection

Prepared by the ICSU/CODATA Group on Data and Information

The International Council for Science (ICSU) was created in 1931 to promote international scientific activities in all areas of natural science and their applications for the benefit of humanity. More than 135 nations adhere to ICSU or its scientific unions. Since its creation, a major objective of ICSU has been to assure that scientists in all nations can obtain access to data and other types of technical information that are essential to their work. In April, 1998, the name of ICSU was changed to the International Council for Science (formerly International Council of Scientific Unions).

ICSU and its member organizations have become increasingly concerned about the recent proposals pending before WIPO and some national legislatures to introduce a new form of sui generis intellectual property protection for the contents of databases, which would fall outside the traditional patent and copyright regimes. Because of this concern, ICSU and its Committee on Data for Science and Technology (CODATA) have jointly created a Group on Data and Information. This document has been prepared by the Group and has not been reviewed by ICSU.

I. Need For and Justification of a Sui Generis System of Protection

Neither the European Union nor the World Intellectual Property Organization ever commissioned an impartial legal and economic study to demonstrate the shortcomings of existing laws pertaining to investments in databases. In the absence of such a study, assertions that investors are deterred by a perceived lack of incentives remain anecdotal and unsubstantiated, and they ignore the arsenal of legal and technical measures currently available to data vendors. In fact, the rapid growth in the past few years of electronic databases of all kinds, including hundreds aimed at the scientific market, hardly suggests a lack of incentives.

The need for a new intellectual property right has not been demonstrated.

Copyright laws still cover the bulk of all factual compilations and databases, because only a minimum quantum of selection or arrangement is required to qualify under these laws. Thus, they suffice to protect most investors against wholesale copying for the purpose of developing a competing product.

To the extent that copyright law fails to protect the contents of any given database, contract and unfair competition laws provide additional layers of protection. Access to all databases transmitted via the Internet or other telecommunications networks is already subject to the contractual conditions of the providers, as is the distribution of data via CD-ROMs. As regards online bibliographic databases covering papers in scientific journals and other such dynamic databases, which are updated on a continuing basis, the provider can simply deny copiers further access to them. Because the value of these databases derives primarily from their being up-to-date, denial of access will quickly reduce the value of an old database in the customer's possession.

Moreover, contract law has been reinforced by self-help technical measures, such as encryption devices, technical brakes on downloading, and electronic "tagging," which provide database makers with formidable weapons to protect their investments against free-riding appropriations of the data they compile. These technological measures are expected to become even more powerful in the future.

In the event that copyrights, contracts, and self-help technical devices failed to repress wholesale copying—a remote possibility, in our view—the unfair competition laws already extant in most countries would suffice to interdict parasitical or market-destroying business practices. The fact that courts have shown a willingness to apply unfair competition law in appropriate cases indicates a viable alternative to far reaching intellectual property legislation. If necessary, unfair competition laws can be fine-tuned to meet future needs as they emerge.

Given this arsenal of weapons, there appears to be no basis for claiming that would-be investors in database production face an imminent loss of incentives. Nor does it seem wise to proceed further with untried and socially costly forms of legislative relief for a problem whose existence has not been demonstrated. On the contrary, contracts law—in combination with encryption devices and other technology—now appears to provide such a formidable means of regulating the flow of data that there is, if anything, a need to legislate limits on the burdensome terms and conditions that some online data providers have contractually imposed upon educational and research libraries.

ICSU's Position in a Nutshell

The ICSU Group contends that the EU Directive represents an unwise and unjustified response to the database publishers' weak case for relief, one which was based on insufficient study of the relevant empirical and economic data. The Group further contends that implementation or emulation of a sui generis exclusive property right in the contents of databases along the lines of the EU Directive could irreparably disrupt the full and open flow of scientific data which ICSU has long labored to achieve, and that it could otherwise seriously compromise the worldwide scientific and educational missions of its member bodies and agencies. In this document, the ICSU Group has accordingly sought to acquaint governments, inter-governmental agencies, and other concerned parties with the growing body of evidence that supports the following conclusions:

- There is, in fact, no failure of incentives that would justify enacting a new exclusive property right in the contents of databases.
- If such a failure of incentives should materialize in the future, other, socially more desirable means of dealing with it are available in domestic laws.
- Even if these socially more desirable alternatives were to be adopted, special care must be taken to promote the public interest in science, education, and research libraries and to ensure that these institutions are left in no worse a position than they occupied before any such remedial action was taken.
- No new international treaty regulating intellectual property rights in the contents of databases should be proposed or adopted without serious, sustained, and impartial study of all its potential effects. As stakeholders in the information economy, the worldwide scientific and educational communities should participate fully in the relevant deliberations.
- Any proposed treaty must respect the special needs of the developing and least-developed countries, which look to the acquisition of scientific and technical knowledge as the foundation of their future economic progress.
- If further studies eventually lead to a consensus concerning the need for international action to protect the contents of databases, any such action should be premised upon a cautious, minimalist approach that leaves maximum flexibility to each participating state.

In the following sections, we seek briefly to explain and support these conclusions.

II. Nature and Extent of a Possible Sui Generis System of Protection

The scientific community does not condone free-riding and does not oppose reasonable measures to encourage investment in the compilation of commercial databases, if a demonstrable need should arise. However, the Group believes that investment should not result in "ownership" of data discovered in nature or in the power to exercise an exclusive property right in the building blocks of knowledge.

The EU Directive is not a suitable model

The ICSU Group, therefore, opposes efforts to internationalize the EU's sui generis database law. This law posits an exclusive property rights model that is paradoxically stronger than the mature copyright paradigm itself and that also lacks the kind of public-interest safeguards and limitations that are built into the "cultural bargain" underlying the copyright paradigm. The EU Directive and, implicitly, the proposals made to WIPO in 1996, which are based on that model, have many troublesome features:

- The creation of an absolute exclusive property right in the contents of databases;
- Reliance on a very broad and inclusive definition of databases that potentially covers every information product that has heretofore been freely available from the public domain;
- The introduction of long and potentially perpetual terms of protection based on unlimited renewal rights in a database as a whole whenever updates are added to it;
- No evolving public domain from which previously compiled data could ever freely be used;
- No mandatory public-interest limitations of any consequence for the preservation of public-good activities, such as research, education, and libraries;
- No mandatory legal licenses or other limitations requiring sole-source providers to make data available on reasonable terms and conditions, with due regard for the preservation of competition and the public interest in research, education, and economic development;
- Such a broad and pervasive concept of use or extraction of a substantial part of a protected database as to vitiate the one exception that nominally allows use of insubstantial parts of that same database;
- No preservation of value-adding or transformative user rights either in the same or distant markets;
- The introduction of strong civil (and, possibly, even criminal) remedies for infringement that could have a chilling effect on the use of data for any purpose, including public-good purposes.

The end result is a blueprint for an extremely restrictive intellectual property right, one that will become engrafted upon the natural monopolies that already characterize the market for databases and which could lead to effective ownership of the building blocks of knowledge.

If data piracy should empirically become more of a problem than it has proved to be so far, then the appropriate remedy is to attack piratical conduct as such, mainly by means of unfair competition law. Therefore, The ICSU Group feels that there should be no presumption that the EU's sui generis database regime is the appropriate model to follow. On the contrary, the first lawsuits based on the EU Database Directive may well prove that the Directive is a product of inadequate theoretical and empirical study, that it contains serious technical and conceptual flaws, and that it is economically unsound. It is also worth noting that another EU Directive, i.e., the Council Directive on the Freedom of Access to Information on the Environment, requires that relevant data collected by public authorities must be provided at a reasonable cost to users, and that provisions of the EU Directive on Databases may be inconsistent with this requirement.

Until these issues are properly evaluated, the rest of the world cannot afford to adopt the intellectual property laws of the European Union. .

In sum, the Group agrees that courts and legislatures may legitimately repress certain uses of data when these uses amount to parasitical or predatory forms of competition that inhibit investment in the compilation of commercial databases. If and when it is shown that more is needed, the Group could support minimalist, pro-competitive efforts to interdict parasitical copying, but cannot support the imposition of an exclusive property right in data.

Action on an international treaty is premature

The foregoing discussion reveals the extent to which sui generis database protection remains untried and untested even in the European Union, whose member states are still implementing the EU Directive of 1996. Furthermore, the need for such regimes has yet to be demonstrated in the rest of the world. There is, accordingly, no solid foundation for adopting an international treaty concerning the legal protection of non-copyrightable databases, because treaties governing international intellectual property rights require a consensus about needs and modalities that will take years, if not decades, to form.

In the meantime, the most appropriate action for WIPO is to undertake a serious, impartial, broad-ranging study of the issues, without any preconceptions or biases with regard to any particular set of proposals or solutions. The scientific and educational communities should participate fully in these deliberations, along with all other stakeholders whose interests might be affected by an international treaty to encourage investment in databases.

As regards the argument that the reciprocity clause of the EU Directive requires action at the international level, it should be understood that many—if not most—of the Continental European countries have fallback laws (especially unfair competition laws) that could prevent free-riding duplication of the contents of databases; access to these laws by foreign vendors cannot be denied under the national treatment and MFN clauses of the TRIPS Agreement. Moreover, there is reason to question the compatibility of the EU's reciprocity clause with the now universal norm of national treatment under the Paris, Berne, and TRIPS Agreements, and with the "chapeau clause" of Article XX (g) of the GATT 1994's component of the WTO Agreement itself, which forbids use of domestic intellectual property laws to create disguised barriers to trade.

This tension would become especially acute if other countries rejected the EU's exclusive rights model and insisted on more pro-competitive approaches and on national treatment. This would place the EU in the difficult position of protecting foreign data vendors under its Directive, or risking retaliation by other states and widespread recourse to similar reciprocity clauses in future legislation of interest to innovators and investors in the developing countries.

If, after thorough study, it should eventually appear that some international action to deter the wholesale copying of the contents of databases were still needed, then a cautious and minimalist treaty to prevent piratical conduct by specified means could be considered. In that event, the Convention for the Protection of Producers of Phonograms Against Unauthorized Duplication of their Phonograms of October 29, 1971 ("Geneva Phonograms Convention") might provide a suitable model. That Convention leaves the mode of implementation up to the contracting states and allows them to choose from a menu of legal options that include "protection by means of the grant of a copyright or other specific right; protection by means of the law relating to unfair competition; protection by means of penal sanction." Such an approach would not oblige any country or group of countries to adopt any particular antipiracy law, so long as some effective antipiracy regime were set in place.

III. The Impact of a Possible Sui Generis System on the Access to Databases

Scientists are both users and producers of databases. However, scientific databases are seldom static; in the course of their research, scientists frequently draw on several existing databases from which they create a new database that is tailored to their specific research objectives. The synthesis of data from different sources in order to provide new insights and advance our understanding of nature is an essential part of the scientific process. The history of science is rich with examples of data collections which played a crucial part in a scientific revolution that in turn had a major impact on human society. It may truly be said that data are the lifeblood of science.

Impact of Database Protection on the Conduct of Science

The following set of broad principles for the conduct of science is an attempt to provide standards against which organizations and individuals can evaluate legislative proposals that affect the use of scientific databases.

- Science is an investment in the public interest. Through research and education, scientists foster the creation and dissemination of knowledge, which has profound effects on the well being of people and the economies of the world. Science is increasingly recognized as a critical public investment in the future, a resource with extraordinary dividends.
- Scientific advances rely on full and open access to data. Both science and the public are well served by a system of scholarly research and communication that moves rapidly and openly with minimal constraints on the availability of data for further analysis. The tradition of full and open access to data has led to breakthroughs in scientific understanding, as well as to downstream economic and public policy benefits. The idea that an individual or organization can control access to or claim ownership of the facts of nature is anathema to science.
- A market model for access to data and other technical information is unsuitable for scientific research and education. Science is a cooperative, rather than a competitive, enterprise. No individual, institution, or country can collect all the data it needs to address important scientific issues. Thus, practices that encourage data sharing are necessary to advance many fields of science and to achieve the resulting social benefits. Such data sharing is possible only when the data are affordable within tight research budgets. If data are formally made available for scientific access, but the prices charged for such access are prohibitively high, the negative impact on science is the same as if access had been legally denied. This is especially the case for scientists in developing countries.
- Publication of data is essential to scientific research and the dissemination of knowledge. The credibility of research depends on the publication of the data that back up the conclusions from the research and permit reproduction of the results by colleagues. Any restriction on data publication or any requirement that the database be recompiled from original sources for validation purposes compromises the ability of scientists to advance knowledge.
- The interests of database owners must be balanced with society's need for the full and open exchange of ideas. Given the substantial investment in data collection and its importance to society, it is equally important that data are used to the maximum extent possible. Data that were collected for a variety of purposes—basic research, environmental monitoring, industrial R&D, etc.—are useful to science, so legal foundations and societal attitudes should foster an appropriate balance between individual rights to data and the public good of shared information.

It follows that, when legislators consider enacting intellectual property laws to promote investment in the compilation of databases, they must take into account the potential impact such laws may have on science and education in general and on the complex worldwide network through which scientific data are currently exchanged in particular. The guiding principle should be that any domestic or international initiative in this direction should leave science and education in no worse a condition than they were in prior to its adoption.

The risk of monopoly pricing and other constraints on the exchange of data

A recent study by the U.S. National Research Council stresses the extent to which the existing market for scientific and technical databases is characterized by natural monopolies and by a distinct lack of competition. Under present-day conditions, the costs of entry are typically so high, while the niche market segments on which commercial exploitation becomes feasible are typically so small, that sole-source providers are the norm. Moreover, in the case of databases of observed values of time-dependent (or one-time) natural phenomena, such as sun spot cycles or earthquakes, the data are inherently unique, so that it is impossible to recreate the database.

If investment in databases lags behind some hypothetically desirable but still unattained level, despite the arsenal of existing legal and technical protective measures identified above, the reason is that user markets remain small in relation to the high costs of entry. A new exclusive property right will not increase the size of those markets and may actually decrease overall investment by impeding value-adding uses and by erecting otherwise insuperable barriers to entry.

Proponents of a sui generis approach argue that second comers can independently create a database from scratch, but this is often economically unfeasible in practice. In addition, the observations of interest to science may not be repeatable or the relevant data may be proprietary to begin with. Even when independent creation becomes feasible, reinventing the wheel is not consistent with either the norms of science or of market economics. Rather, science builds cumulatively upon its preceding contributions, and any legal solution that compelled users either to recompile data from scratch or to pay monopoly prices would greatly elevate the costs of both basic and applied research.

Because most databases are either natural monopolies or intrinsically defended by high barriers to entry, implanting a strong exclusive property right into this environment will tend to produce an absolute legal barrier to entry. This, in turn, facilitates monopoly pricing and fosters a substantial risk that big commercial providers will gradually control the building blocks of knowledge.

Under these circumstances, the potential harm to the scientific enterprise is enormous. Basic science needs abundant, unrestricted flows of both raw and evaluated data at prices it can accommodate within the present severely restricted research budgets. Indeed, the evidence suggests that "efficient" use of data is a concept antithetical to the norms and practice of basic science. On the contrary, by using all available data in ways that encourage serendipity and imaginative exploration, basic science arrives at precisely those breakthroughs that lead to technical applications later on. When, instead, data become too expensive, scientific research is retarded. We see a concrete example in the failed attempt by the U.S. Government to privatize Landsat data in the 1980's, which raised the price of data sets from $400 to $4400 per image and set back important research areas for nearly two decades.

At the very least, complicated licensing transactions that would undoubtedly arise if protection is extended to the contents of databases used for science will deter and diminish the transborder flow of data that ICSU and its affiliates have painstakingly negotiated over the years. This will hinder scientists seeking to construct ad hoc databases from disparate sources in order to attack major societal problems such as global climate change. Pressures will also be exerted against the sharing ethos and against the principle of full and open access to data in general. Because many scientific databases are worldwide in scope, the problem of integrating data sets from different sources will become acute over time if some are protected and others are not, and these complications will worsen if the norms of science themselves change in response to the advent of proprietary rights in data.

In sum, if databases that are now freely available fall under sui generis exclusive property rights, the cost of research will inevitably rise and much less of it will be successfully undertaken. Moreover, the culture of science, which presupposes the sharing of data among institutions, will also change, as these institutions begin to treat their own databases as profit centers. All business and government agencies that conduct or depend on research will be adversely affected in the end, whatever their expectations of short-term gain at the moment.

Special needs of the developing countries

Among the factors that can significantly affect the powers of the least-developed and developing countries to overcome technological lag and other economic disadvantages is the growing potential for rapid international diffusion of scientific and technical knowledge. Because their national systems of innovation are still in the process of formation, there is reason to hope that these countries can rapidly accommodate new information technologies in ways that accelerate leapfrogging, reduce path dependence, and overcome technological "lock out." Measures that increase the relevant local communities' direct access to the world's cumulative store of technical knowledge in the cheapest, most efficient manner are thus of primary concern in any effort to boost national competitiveness.

In this context, one cannot overemphasize the extent to which the knowledge needed to embark on specific technological paradigms tends, in its early phases, to be public knowledge, often generated by universities and research institutes. Public investment in both the infrastructure for accessing foreign technical knowledge and in higher education are thus critical components of an appropriate institutional framework for catching up and leapfrogging. Assuming that a developing country can muster the investment needed to establish adequate telecommunications infrastructures, it can accelerate the transplanting of know-how from more industrialized countries through electronic transmittal and storage of technical information.

The advent of the Internet as a low-cost method of conveying digital information could thus make specialized, heretofore path-dependent know-how universally accessible. To the extent that basic science lends itself to industrial applications, electronic databases can facilitate its translation into new technologies everywhere, so long as the receivers are otherwise capable of absorbing the data and of defraying their cost. It is therefore in the interest of developing countries to fashion a legal framework that enhances the flow of information along telecommunications networks and that otherwise accelerates the transfer of know-how.

Proposals to encumber the full and open access to scientific and technical data by means of a sui generis exclusive property right in the contents of databases would severely compromise these prospects for more rapid economic growth in the developing countries. Such laws would, at the very least, increase the costs of acquiring data and of conducting research at the very time when developing countries must spend huge sums to adapt their own institutional framework to the changing universe of digital communications networks and to provide their local scientific and technical communities with the equipment to access available resources. At worst, such laws would balkanize the transborder flow of data and restore the conditions in which technological lockout previously flourished.

The developing countries are, moreover, already subject to considerable economic and political strains due to the need to enhance their existing intellectual property systems in order to comply with the high international minimum standards that the TRIPS Agreement of 1994 mandates for all WTO member countries. There is no reason for these countries to assume additional intellectual property burdens without countervailing trade concessions, especially when such new burdens could compromise their ability to access needed scientific and technical data.

Many developing countries in the ICSU family believe that an international treaty such as that under consideration by WIPO could weaken the growth of science and innovation in the less-developed world, and pose a serious threat to the integrity of science. The Group believes that ICSU should not support any treaty that would exploit developing countries' vulnerability in terms of preparedness level and affordability.

IV. Main Elements of a Protection System

Information and data are the raw materials of the information age. Moreover, information possesses a dual nature that legislators must take into account.

The Dual Nature of Data and Information

On the one hand, data and information are bundled into private information goods that compete on the general products market with or without intellectual property protection. On the other hand, data and information constitute the building blocks of knowledge, and there is a well-recognized public interest in ensuring its availability for the progress of education, science and research, and for the further development of new, value-adding information goods. Access to information for these public interest pursuits is guaranteed by express exceptions and limitations built into the classical intellectual property paradigms and, more generally, by the negative mandates of these same paradigms, which subject all unprotected information goods to the rigors of free competition.

Sooner or later, moreover, classical intellectual property laws relegate all protected information goods to the public domain. One cannot sufficiently emphasize the extent to which the exceptions and limitations built into the classical intellectual property paradigms in order to promote the public interest in education, science, research, and free competition end by stimulating the creation of new information goods that are privately exploited either on the general products market or on the specialized market for literary and artistic works.

Given the dual nature of data and information, legislators must avoid overprotecting them lest such protection inadvertently obstruct the hitherto unrestricted upstream flows and consequent social benefits that were previously taken for granted. Overprotection would deprive basic and applied research of their essential nutrients and retard the progress of worldwide economic development. We are not just concerned about today's information industry, but about the industry of tomorrow and the day after that. In the information economy, we are all generators of information and we are all users and borrowers of other peoples' data and information as well.

For technical and scientific purposes, moreover, there is simply no valid distinction between data and the database. Strong protection of databases means that our future technological growth and production will become subject to the permission of publishers and to the ability of users and researchers to pay the fee-per-use prices that publishers will impose under electronically controlled, "take it or leave it" access contracts.

Preserving the public-good uses of data

If circumstances were to justify international action to protect the contents of databases (and even if such action were rooted in unfair competition law rather than an exclusive property right), the relevant international and national laws should provide measures to safeguard the scientific and educational communities' ability to obtain access to both publicly and privately funded data on reasonable terms and conditions. This need has, of course, already arisen in the European Union, where the EU Directive allows member states the option of enacting limited exceptions to, and limitations on, the new sui generis right that favor teaching and scientific research. The ICSU Group urges the EU and affiliated governments to implement such exceptions broadly, with due regard for the principle of full and open access to data generated with public funds, and it hopes that the European Union will encourage the member governments in this respect.

Implementing appropriate exceptions and limitations will require careful distinctions between uses that are "free" and those that providers must permit, but on fair and reasonable terms and conditions. Beyond these technical considerations, the scientific and educational communities need:

- Access to data on reasonable terms and conditions;
- The ability to use the data thus accessed for any research or educational purposes, including publication;
- Freedom from contractual or technical interference with these privileges.

A bedrock principle should be that whenever a given database is substantially funded by government and made available to the public, such data should always be accessible to the scientific and educational communities at no more than the cost of fulfilling the user's request (i.e., the marginal cost of reproduction and dissemination). This same principle should apply even when the database is partly or insubstantially funded by the private sector, as might occur with regard to private sector dissemination of government data, irrespective of the prices that providers and distributors may charge other users for other purposes.

Conversely, when the private sector or other nongovernmental entities fund the generation or distribution of data that are made available to the public, the ability of scientists and educators to gain access to those data for public-good activities remains indispensable, even if a different calculus of rights and duties is required. Database producers who benefit from legal protection of their databases should charge scientific and educational users fair and reasonable prices that take account of the overriding public interests at stake.

When, accordingly, data not funded by government are made available to the public under any domestic law that protects investments in databases (including unfair competition laws or variants thereof), that law should preclude the provider from denying access on preferential terms to the data for research or educational purposes. The law could also require that researchers and educators who thus obtain privately funded data should pay equitable compensation for these uses.

In putting forward these constructive proposals for balancing the interests of private data vendors with those of the research, educational, and library communities, the ICSU Group does not concede the propriety of enacting exclusive property rights in data—on the contrary, the Group wishes to reiterate what was earlier affirmed to be the single most basic proposition for the WIPO inquiry getting underway, namely, that all data—including scientific data—should not be subject to exclusive property rights on public policy grounds.

IV. Conclusions and Recommendations

The ICSU Group believes that the need for sui generis legislative action to protect the contents of databases has not been demonstrated at either the national or international levels, and that the burden of proof lies on those who claim existing laws are inadequate. Furthermore, new legal and technical developments that strengthen the capacity of existing laws to prevent parasitical and predatory forms of competition should be carefully evaluated and encouraged before introducing a radical new protection paradigm.

Nothing prevents courts, administrators, and legislators from devising reasonable constraints on free-riding conduct that destroys the incentive to invest in the compilation and dissemination of databases, and efforts to inhibit parasitical or predatory copying as such merit further study. To do so does not require either an exclusive property right or any legal definition of databases.

Legal restrictions on the full and open exchange of data inherently conflict with freedom of speech, and the imposition of exclusive property rights on data would seem to encounter insuperable constitutional impediments in some countries, such as the United States, as well as fundamental public policy objections in all countries. Developing countries, in particular, have much to lose and nothing to gain from such initiatives.

In this connection, any legislative action at either the national or international levels should be demonstrably pro-competitive in effect, and should contain built-in measures to avoid abuse without the need to invoke antitrust or ancillary remedies. Care must also be taken to preserve adequate incentives for follow-on innovation and transformative uses of data in both the commercial and noncommercial spheres of activity.

If additional international regulation of databases becomes necessary-a remote possibility, in our view - then it should be premised upon a minimalist approach that affords the maximum flexibility for each member state to address parasitical copying by means that are consistent with its own legal and economic policies. In all such cases, appropriate exceptions and limitations must be devised to maintain the full and open flow of data and information to the research, educational, and library communities and to ensure that these communities are left in no worse condition than they were in before any such action was taken.

Moreover, such exceptions should not expose these ongoing public-good activities to the vagaries of case-by-case decisions, and must instead stabilize and institutionalize long-term practices of price discrimination and product differentiation. The difficulties of identifying and implementing a suitable balance between incentives to invest and the preservation of both free competition and essential public-good uses should not be underestimated, nor should legislation be rushed before a full understanding of the consequences is reached.