

ACCESS TO DATA AND THE CONQUEST OF SPACE.

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ABSTRACT

The on-going effectiveness of the conquest by human beings of outer space employing measures consistent with protecting its environment demand that we design a strategy and correlative implementing programs to achieve three major operational [imple- mentation- all] goals. This strategy presupposes that our overriding goal will be that of control - over the technologies for mastering space, and over the activities and relations of those participating in mastering space.

To this end the challenge is that (a) we must find the means to shape, coordinate and harness the technologies and draw effectively upon the global pool of scientists, technologists and associated elites to provide the scientific enlightenment and knowledge, demanded in a comprehensive, cooperative and continuing exploration and use of space; here the demand is upon implemented cooperation and cooperative enterprise; (b) in order to have available the necessary skills and organization we must provide the means to enable those engaged in space technology to share in the outer space data pool -

through data manipulation and timely access to the expanding data flow now familiar in the ambiguous notion of an "information highway"; and (c) in order to motivate those that are to be participants in the outer space enterprise we must enable states and their citizens to enjoy proprietary protection of their data and technical know-how commensurate with maintaining into the future a market economy and market openness assimilating a global and spatial [or space based] economy.

These are major objectives for a global strategy; expanded into operational programs they would necessarily lead us deeply into matters involving problems of jurisdiction and control, into demands for the generation of and access to technological and scientific data on an immense scale, and they include associated demands for retrieval techniques to have access to that data and to be assisted through retrieval to make the comparisons, shape the conceptual frameworks and carry on the other operations with data that give it its

imaginative and scientific force. They shift by necessity to institutional practices that will centralize participants, their perspectives, their decisions and policy-making.

These goals presuppose a coalescing of the public order among states and with it a continuous, deliberate shaping of attitudes that are most likely to overcome the tendencies among states to resort to hostilities. In the terms of legal order they presuppose overcoming the problems entailed in conflicts of legislation, or conflicts of jurisdiction. They presuppose support of the economies of states through a strengthened network of cooperative efforts in trade, commerce, and communications.

Cooperative attitudes are favored by states in their own interest. Hence they do not presuppose the demise of competitive attitudes or actions. But they do presuppose that states long wedded to the competitive urges and claims to power - even to pursuing those claims through force and hostilities - will be able to establish operational and effective checks on the resort to force. These are goals that commingle the perspectives of the dynamics of a changing reality brought about by technology with the perspectives of a law necessarily formulated in a dynamic context to regulate that changing reality. The approach taken to provide human control in human activities of any kind is served by first formulating

even rudimentary, general principles. These may be refined by debate, consultation, and the assimilation of the work of objective observers.

A data bank shared among nations with ready access and comprehensive inventory of data is a possible institutional option and might be considered as an example. Data access to technology among nations along with the related know-how engages many social themes. The workings of a data bank will grind down the competitive elements of state behavior eroding their claims to absolute sovereignty and their demands across the board of reciprocal treatment. And it strengthens our perception that one of the elements of sovereignty is that a state may choose, in its own best interest, the road to cooperation. A major, relatively permanent shift toward cooperative endeavor of the global community is glacial: recall, for example, our experience with the International Satellite Monitoring Agency.

Because we can expect that perspectives are certain to change with changing technologies, we can also expect that the legal framework for the regulation and use of a data bank will also be modified to accommodate new perspectives among states and their citizens concerning cooperative endeavors.

The environment in which we might develop a data bank of important technologies embraces the competitive pro-

cesses for power. The outcomes of technologies are quickly seized by the military forces, and protection of the technologies is demanded under strictly enforced laws relating to their proprietary nature.

Environments of this kind are the outcome of the interactions of states, so that we are assured that while space is a "place," the significance of what goes in space is determined from the interactions of states, and the extent to which their claims for power are adjusted or reconciled. The interactions appear primarily in the processes of fact, in which states insist upon their versions of factual situations, events or happenings, in the processes of claim in which they make claims and counterclaims about their own and other state's conduct and the legitimacy or permissibility of that conduct under law, and their decisions relating to how this flow of claims and issues will be disposed of. How states perceive factual situations necessarily determines what the "objective" facts really are. It is noteworthy that states in working through these processes and claims and their converging perspectives about the authority and control that evolves from their practice enables them to reach accommodations or adjustments that are, in effect, the way in which law is created amongst them.

The interactions of states are also perceived in the context of a global public

order enveloping terrestrial and now outer space activities under a comprehensive, evolving scheme. Space is not the locus of new regulatory processes - but its environment and the costs of conquest may intensify the need to strengthen the existing processes. Control of actions imposed in behalf of the community of states - i.e., through their broadly based consent - is traditionally managed either through checks and balancing against excess or unreasonable conduct among sovereign states, or by establishing global order arrangements among them to impose control in behalf of the community at large, or by combinations of these.

A word must also be said about the arena of state decision and policy making: there is inherent in state interactions much that involves the competitive drive. Scarce resources and scarce talents and capital fuel this drive. States are not seen in practice to be willing to relinquish their claims to power as the prime base value that they are seeking nor are they seen to shift readily away from competitive activity where claims for power dominate those interactions. The claims for power extend across the spectrum of state activity operating in peacetime as well as during hostilities. The competitive drive for power translated into the matter of data, we can quickly perceive that control of data, technologies, and the momentum toward acquiring and refining our sciences and technologies,

have all become the key components in the strategic policy instruments of states everywhere.

The technologies - perhaps politically neutral - reinforce the strategic instruments at our disposal. They afford us a kind of multiplier for promoting their impact - of the impact upon the delivery of force by military means. They install new bases of power to draw upon in future actions. In short, the main theme of the changing bases of power is the appearance of the key technologies, and as a necessary power-oriented element of the technologies themselves, the mastery and control of these technologies. From such mastery comes access to limitless sources of energy and to new materials. With the mastery of materials come the competences to shape them into new materials with superior or even subtly controlled hardness, resilience, strengths and flexibility and other properties essential for space objects or satellites. The spill over this to terrestrial applications is obvious. And access to outer space alone is fruitless in this sense without the technological capability for exploitation of energy and materials.

One commentator has assessed the change in the mastery of energy and materials in terms of our ability to achieve the outcomes of "work," i.e., to impose through energies at our disposal our will upon matters that serve our needs. This

commentator, in the German publication, DEUTSCHLAND, [Nov-December 1993, #2, Professor Bert Ruerup, Technical University of Darmstadt and University of Leipzig], observes that "human work is not replaced in energy terms, but rather work itself is replaced."

Work is therefore being shifted to computers for guidance, control of operations, direction, and output, and to energy sources harnessed for the needed work from such sources as we make available through our technologies. The work of human beings always involves through human purpose the attainment or conservation of fundamental value goals: improved wealth, access to resources, and well-being, and also in military power and strategy terms improved access to the means to strengthen our military capabilities. Work and technology operate together to support, strengthen and even establish the grand strategy of nations and determine their power in both present and future contexts involving state interactions. The data involved in the conquest of space are therefore of great consequence in the achieving strategic and policy goals.

PRINCIPLES

The fundamental principle that links our promotion of the technologies and our establishing order in our activities and relations among states is expressed in English in the term "control." Operating pursuant to this principle we shift our attention

away from the more nebulous and less fruitful pursuit of a "conquest" of space to the closely monitored pursuit of cooperative efforts in the conquest of space. The one leads to an increase in the power base, while the other toward the sharing of a great commons arena.

Effective global controls to ensure a peaceful exploitation of outer space are similar to the controls we have adopted for terrestrial activities. We look to enforcement, to measures to ensure effectiveness and follow through on control, and to appropriate sanctions and coercions imposed to promote public order. The demands for public order are the demands for shared enterprise while the realities of those demands reveal that powerful states are more likely to be "heard" than are the smaller states. The multilateral context of state interactions in space quickly leads us to inquiry into consensus, voting procedures, consultation, deliberation and so on so that institutions and practices can be designed, their economies and efficiency assessed, and selection made from the best policy options available. But these like the control regimes themselves are tailored to meet the needs and circumstances of a changing environment, and an assessment of the full impact of measures such as these must be appraised following a review of the general literature.

Hence the "grand" policies of states, already ex-

pressed as principles in the major treaties on outer space, and in the all pervasive United Nations Charter, are inclusive: states have asserted in constitutional terms that they want to meet broad and common goals, even if nebulous, goals. These are the principles expressed in the Charter, including the maintenance of international peace and security, and by implication that they seek the public order to make these objectives fall within reach. To this end they have insisted that they will use outer space for the benefit of mankind, treat it as a "province of mankind," accept the guidance of the referent "common heritage of mankind." Such perspectives reduced to their logic would suggest that they have agreed to exploiting space primarily if not entirely for scientific purposes. But we are ever aware that such perspectives must be "defined" against the realities of the competitive power base inherent in the interactions of states. The conquest of space is in some lights the conquest of power.

The extraordinary power leverage or power multiplier made available through major acquisitions of technology need only be mentioned to indicate the socially oriented difficulties arising from the competition of states for power. With this in view, it is evident that the challenge for social controls that we presently face can be met at this time primarily by an agreed agenda or framework of principles at first drafted in

general language. But we must be wary that such principles are not intended to remain frozen - unable to accommodate major social or technological change.

Principles of the kind discussed here are shaped by the functional setting: they may operate as principles in the traditional sense, cumulative of laws or of the means to establish law in the future; or they may operate as criteria or guidelines to future action as does law itself; or in some functions, they may operate as directives. The term "principle" accordingly has meanings and regulate future functions that are determined by the context in which it is used. Principles as we use them are not intended as normative in the absolute sense.

Thus the presupposition is that the principles in the treaties relating to the control over and expropriation of property are likely to be refined continuously as states seek to exploit property and energy from space and discover that the existing treaties and principles prevent their doing so.

The impact of treaty principles and the duration of their effectiveness will be determined once trends, through state practice, are established regarding their assimilation into the working or operating law of space. Even though the treaties are assumed to have an indefinite term or period, there is nothing in state practice to sug-

gest that these declarations added to a treaty or omitted have led to treaties being in force for long periods of time. The Outer Space [Principles] Treaty of 1967 and the Moon Treaty are noteworthy in the adoption of language that was intended to serve constitutively a global public order - even though when adopted and up to the present a fully, or even adequately, established public order can only incrementally be established.

Proposed Principles

Other principles also in a draft stage, must be formulated for the operable aspects of the data bank, or to control access to the data or its use. Data and technical know how have not been defined here, and this problem must be met. Other problems that need to be addressed include those arising from "real time" data: data that should be deposited on a timely basis to avoid impairment from delays in deposit. In the following I have provided a discussion of the principles on an informal and illustrative basis.

[Reliability of Data]

The principle relating to the reliability of data deposited is intended to be liberally construed because the objectives to be served include the claims of the community at large. Of course, states acting in their "sovereign capacity" may refuse to accept or implement such a principle, but that attitude is tantamount to a claim that the public order does not exist or serve their inter-

ests. The reliability principle holds that data deposited in the data bank are to the best of existing knowledge reliable for the purposes that they purport to fulfill.

This principle if adopted would establish a duty of responsibility and accountability upon all who develop the technological data for the conquest and exploitation of space that would include reliability, genuineness of the data, and a declaration of known sources of harm that might be ignited if the data were improperly used. It would provide the basis for liability for compensation or other relief as well. It would operate against appropriate community standards and expectations that states will refrain from depositing or recording specious, deficient, deformed or fabricated data, and on the positive side, to advise the user obtaining the data from the data bank about the intended use or value of the data, and the conditions under which it is to be used. The question of reliability where data are to be used only for "peaceful purposes" raises an issue that needs to be addressed.

[Commitment Principle: Undertakings to Provide Data That are Technologically Competent or Relevant to the Purposes For Which They are Intended.]

This principle, relating to the competence of data in the operational sense, holds that the data in the data bank will be provided all members of the data bank regime for

all bona fide requests, and will include the identification of individuals or groups, or states, that have the technical know-how or data manipulation capabilities to put the data into a useful and usable form for the purpose of space exploitation or exploration. This principle like the first presupposes a minimum public order that has evolved to the point in which states will be seeking through joint efforts a common objective. The principle also presupposes that states or others will not refrain from providing the data or access to the data. The opposing policy that states may demand is that they maintain full control over the data, and simply identify that they possess data of a particular kind, and that they are open to negotiate or consult about that data or its use.

[Compensation for Data: Cost Sharing, Reimbursements and Royalties].

The principle that the data in the data bank will be made available from the bank for payments, license fees, or other charges, but that these will be reasonable and charged on a non-discriminatory basis to others. The regime itself will determine whether such payments are made to the originators of the data directly, or through the data bank - with the data bank retaining some of the fees as received for its own purposes. This principle presupposes that cost sharing or burden sharing will be distributed among states in the acquisition of data for outer space. It also presupposes that costs and

benefits may not necessarily require us to use monetary and arithmetic terms.

[Principle of Accountability - Liability:]

The principles of liability responsibility and accountability are to be adopted from existing principles of international law with especial stress on the Liability Convention to ensure that states will back up their willingness to provide reliable data with their willingness to submit to claims for compensation where they have been negligent in providing technological data or know how. This principle might readily include a dispute mechanism that affords support to the system of control by shifting away from mechanisms dependent upon adversary procedures and institutions and adopt a design of control over those disputes in which resolve their disputes through consensus, consultation, or cooperative measures.

[The Principle of Proprietary Protection] Following the approach and trends taken in the domestic patent and copyright laws applicable within states, and other laws relating to the protection of property and data, states will enjoy such protections as determined by the standards set by the members of the data bank regime. Such protections must be worked out by balancing off the policies for the community at large and its needs for the freedom of data and access to data, and the policies of individual states, and their needs for the pro-

tection of property rights and interests. It is evident that states will claim that data relating to their security and defense will be retained and protected and that they will also claim the overriding right to interpret these protections and when they are to be invoked.

[Notification and Reporting: Warning] The principle of notification, timely warning, and reporting: the principle that all states in the data bank regime will accept a general principle to notify and warn others of dangerous situations, dangerous occurrences in space, or dangerous substances and energy bands; this principle may be coupled with those already in the space treaties including the principle adopted by states in general to refrain from harmful interference afforded through the data acquired by states or otherwise affecting or impairing the activities or actions of others.

[Support of the Third World] The principle of support to the lesser developed countries: this is a general principle taken from the existing outer space treaties reflecting the willingness of the technologically developed countries to provide access to the data bank, assist and where possible provide support, including financial and technological support, to such countries. This principle reflects the wide number of highly skilled technologists and scientists that have come from the third

world, and the need of the third world to share in the benefits of the exploitation of outer space. In the larger sense it reflects the general wide spread interest of states in the betterment of global conditions relating to resources, wealth, health and other aspects of improved human conditions, welfare, and dignity.

[Sharing the Technology Pool.] The data bank in a refined stage may include the general and common sharing of a technology pool. The operating principle relating to this shared claim among the members to the data bank requires access to the competent technologists and scientists, the technological data in an understandable form, to capital for supporting and funding space enterprise or cooperative endeavors, and so on.

The technology data bank and the principles and criteria just mentioned may be supplemented by other principles, refined, enlarged or rejected. Principles may be formulated to regulate against improper use of data obtained from the data bank; grant-back obligations may be imposed upon those who have used the bank, requiring their new data to be deposited; panels of experts can be identified to work through technological assessments and technological disputes; and so on.

But those that seek to negotiate and establish an operable data bank - that is, a data bank that is expected to achieve the objectives of

comprehensive data, full access and effective use must presuppose that states are now aware of the unique significance of their technologies and their technologists. States are aware that their own power will become increasingly dependent upon the mastery and control of technology itself, but they will also become aware that the technologies effectively nurtured and afforded effective investment will serve states as their dominant base of power reaching out to strategies in all directions. Hence refinements of the above criteria and principles would occur as negotiations meet obstacles or opposing policies of the negotiating states that might seek to deflect command of technology to the individual states. But we are all aware that underlying the effectiveness of the regime is the extent to which the social order has matured: the greater the maturity, the more likely the cooperative elements are to becoming operable.

Confidence Building Measures. Where we perceive joint or increased participation as a fundamental principle in cooperative endeavor, confidence building measures more familiar in the support of arms control endeavors might also be implied and specifically designed and employed to achieve common objects of states. Such measures can be invoked through institutions and practices designed to rely upon joint decision making procedures, or, if a shift to such decision making is premature,

we can look at this time to the establishment of highly respected institutions for consultation, inquiry and recommendations. Strengthening participation is a major means of strengthening patterns of conduct compatible with community standards. And these may ultimately lead to the expectations that we associate with the appearance of customary international law.

A confidence building measure operating through consultation in arms control is to be found in the Standing Consultative Commission of the United States-Soviet Union strategic nuclear weapon treaties (cf. Article XIII of the ABM Treaty). Another has been mentioned in earlier papers: the establishment of a general fund, under the institutional framework of cooperative state enterprise, aimed at achieving common objectives. The fundamental features of a general fund or of any cooperative endeavor include at least minimal levels of joint decision making. The general fund is designed with other features as found appropriate: states depositing data in the data bank may be entitled to compensation or royalties for the use of the data that they have deposited: this would assist in the business of cost sharing. But to promote joint decision making, the institution might be designated as the vehicle for transactions, including the transfer of compensation payments.

The general fund might also be the repository of moneys for the purpose of

research into the sciences including the applied sciences - a kind of research, testing and development foundation coupled with a mandate calling for the pursuit of scientific knowledge. The urgency of this mandate might be aroused for example if the Earth were threatened by a comet or asteroid such as that which struck in the area of the Yucatan many millions of years ago, causing total destruction to life on earth and if we were then to consider the talents, organization of competence, and technologies to prevent this strike.

But in all of its manifestations the general fund will be perceived as a state-serving institution - but an institution operating in a cooperative environment toward objectives achievable only through cooperative endeavors. Thus it would enable states, otherwise recalcitrant in giving up their data, to do so under conditions in which they become aware of the importance of sharing their outer space data as well as in acquiring and using it.

POLICIES AND STANDARDS

In any effort such as this aimed at designing first the principles regime, and ultimately a Statute of an Outer Space Data Repository, it is important to consider what steps might be taken to meet the opposing policies of those that might reject the program. For this purpose, aside from the remarks made earlier with regard to the various principles, it is most

likely that general principles concerning the maintenance of international peace and security, building upon those already established, and to some extent pursued, under the United Nations Charter will be the basic level for future trends.

The overall balancing is operable in decision terms through the reasonableness standard. This standard operating in the processes of fact, claim and decision promotes law when it serves to overcome excessive claims (i.e., excessive in terms of being impermissible, or not within the tolerances of the relevant community), or claims that are unreasonable, or abusive in nature. It also operates to overcome differing or opposing claims so that the elements of convergence, and therefore of law, can emerge. All of the decision making processes and the related processes of claim and fact combine under the reasonableness standard to work out the differences when treaties or international agreements are negotiated as well, again leading toward the emergence of law.

This standard usually entertained by the detached, or objective, observer comes into play because the development, even by deliberate prescriptive efforts, of a future Statute and its regime entails the processes of fact - i.e., the combining, selection and identification of the relevant facts, the processes of claim - that is, the processes of reciprocal assertions and

affirmations of claim and counterclaim concerning the propriety, permissibility or legitimacy of positions or claims made by states in their relations with each other, and the processes of decision - that is, the processes for reaching outcomes through processes that couple authority and control [usually identified with law and its practice].

Law, as envisaged here, is a flow, not a finished product. It is the continuing outcome of processes reflected in the interactions of states enables us to perceive law in the dynamic sense - and thus the appropriate instrument of decision for embracing mastery of outer space and the accompanying technologies intended to achieve such mastery. Law envisaged as rule or fixed standard handicaps such efforts, because the policy embodied in law that is fixed thus obstructs the adaptation of law to changing or supervening circumstances and lends itself to the position of continuing opposition to the evolution of changing policies and change in policy. Outer space and its technologies make demands upon us to re-shape continuously our perspectives about what can be achieved in outer space and what is necessary to regulate our activities toward good order in conducting those activities.

In conclusion the fundamental categories of perspective relating to the cooperative enterprise of a data bank or repository can be reduced

to those relating to cooperative endeavor and enterprise. Actions and decisions can be perceived as supportive of such cooperative environments when the actions taken have an impact upon all values shared among states: the balancing of decisions then favor the cooperative endeavor rather than the claims invoked for exclusive possession and use of the data. Cooperative endeavor is therefore strengthened by perspectives of an inclusive effort: the community as a whole is to be benefited, and therefore the community as a whole is to have access to comprehensive technological and scientific data for the purposes of exploiting outer space. The attitudes of states displayed in their practice in working with the data are aimed at extending community standards and community claims upon the data.

All of these observations are well and good. But it is evident that without practical state support applied in practice states will not proceed further than to insist that the objectives of data banks are idealistic or unrealistic, or that such a proposal fails to serve a community of states firmly bent upon competitive claims for power and through it for influence. Such states assert that only through power will they be able to protect themselves, maintain the common defense, or ensure the security of their actions and transactions.

There is an alternative available: general principles continuously subject to

being refined can guide us in data accumulation and access during the transition of states through what I call their competitive period. We can look to a future of a more cooperative effort as state attitudes permit. Data acquired from or for scientific investigations, scientific ventures, cooperative endeavors readily recognized among states, and so on are less likely to lead to contesting claims about those data. Cooperation is sharing of costs and talents here in great enterprise. Our approach is intended to put us a step closer toward strengthening public order and public dignity as well. The adoption of a grand strategy to encompass this challenge places a demand upon numerous perspectives - and these can be supplied by much of the talent already enveloped in the International Institute of Space Law.