

URGENT

DST UO No DST/PS/758/89

DEPARTMENT OF SCIENCE AND TECHNOLOGY

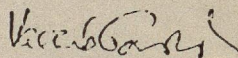
Follow-up of Empowered Group decision on
National Science & Engineering Research Board (NSERB)

As decided at the 10th meeting of the Empowered Group held on 9.2.89, a meeting was convened by the Member Secretary, Empowered Group on April 17, 1989 to consider a general approach to evolving a suitable mechanism for supporting science and engineering research. A strategy around the theme proposed by Prof. Yash Pal, Chairman, UGC was discussed in detail and it was agreed that a draft outline of such a strategy be prepared by him and the undersigned. This paper in consultation with Prof. C N R Rao would then be circulated to all concerned.

2. I have since received a letter from Cabinet Secretariat that the said paper be prepared expeditiously. I had mentioned to Shri T N Seshan, Cabinet Secretary that since the main theme discussed was essentially Prof. Yash Pal's, I had to sit with him to prepare the paper and I undertook to do so immediately after my return - which is what I am doing through this note.

3. A draft of the paper has since been prepared by Prof. Yash Pal. I am in agreement with it, I have made one or two minor changes. I have not been able to discuss the draft with Prof. C N R Rao as he is not here but in view of the urgency, I am sending him a copy as in any case the matter will be finalised in the Empowered Group meeting. The paper for discussion by the Empowered Group is placed at Flag 'A'.

4. Cabinet Secretary had earlier inquired about my views. I had mentioned that they were conveyed to all concerned vide my note dated 7.2.89. A copy of the same is enclosed for kind information.


(Vasant Gowarikar)
Secretary
10.7.1989

S/C.

Chairman, Empowered Group (Shri T N Seshan)

CC:

Member-Secretary-(Dr P J Lavakare)
Empowered Group
Prof. C N R Rao
Prof. Yash Pal.

nc: As above.

An Umbrella structure for funding Science & Engineering
Research

A draft by Prof Yash Pal & Dr Vasant Gowariker for
discussion in the Empowered Group

There is no question that we need to have a unified approach for development of science and technology in the country. Such a unification is currently meant to be achieved through the fact that we have a Ministry of Science and Technology directly under the Prime Minister. However, the Departments under this Ministry function more or less independently, with their own mandates and controlling structure. Furthermore, a great deal of science is outside this Ministry. This includes, viz DRDO Laboratories, ICAR ICMR Laboratories and activities under various other Ministries, such as Industry, Telecommunication, Broadcasting, Home, Energy etc. Even more important, perhaps, the largest number of scientists and engineers, and research students outside all the above mentioned entities, reside in universities and IITs, Medical and Engineering Colleges.

The major science agencies have primarily put in their resources in their own laboratories. They do have "extra-mural" programmes, and, of late, special projects to support their own activities have been given to a number of universities, but particular strategies for supporting institutions to raise them to levels of effectiveness are still rather weak.

If there is one inference that can be drawn from the efforts of various science and education agencies, it is this: whenever selective strengthening of science and technology infrastructure has been created around good people, the results have been spectacular. This can be specially noticed in regard to some of the support in universities and institutes of Technology through programmes such as those of SERC, the COSIST programme of UGC and others. This has enabled these institutions to quickly take on new ideas and new challenges. This has also helped to educate students in an environment of modern day science. However, the inputs have been small and have touched only a very small fraction of the potential generators of science and technology, including S&T management. SERC and UGC together would have spent no more than 90 crores for this activity in the Seventh Plan, to cover about 150 universities, covering about 6000 colleges. This may be the budget of 6 medium sized laboratories.

A Science Foundation in the United States, for example, can correctly concentrate on these institutions which already have a strong infrastructure and funding support through private income, regional state agencies, private foundations or industry. All these are absent in India. Practically all the support has to come from the central budgetary allocations, supplemented by small resources generated by industrial research laboratories. The support is now managed through very large number of agencies, not only in the area of applied science and engineering but also in basic sciences.

The level of support available to different areas and different entities in various organisations is not very well balanced according to needs or potential. A Science Foundation to look after 50 odd crores within a total which is by orders of magnitude larger may be setting up of too big an infrastructures for doing too little. Though we may ultimately transition in that direction, it would be useful to set up an umbrella structure with a secretariat of 5-6 persons, to collect, collate and analyse the information and give advice and direction to various executive agencies for coordination and filling gaps, and even suggest sharing or reallocation of resources. Its inputs to the Planning Commission every year would be of help. After some experience with this we may pave the ground for setting up a National Science Foundation, which will then encompass all non-mission oriented science, whether in laboratories or universities or government departments or agencies, while keeping in mind the special needs of S&T infrastructure in the educational sector.

The membership of the umbrella structure mentioned above will include all the agencies involved in the support of science and technology and half a dozen unattached distinguished scientists and technologists. The Chairmanship of the body may be in UGC or DST or OSA with its Scientific Secretariat in DST.

An Umbrella structure for funding Science & Engineering
Research

A draft by Prof Yash Pal & Dr Vasant Gowariker for
discussion in the Empowered Group

There is no question that we need to have a unified approach for development of science and technology in the country. Such a unification is currently meant to be achieved through the fact that we have a Ministry of Science and Technology directly, under the Prime Minister. However, the Departments under this Ministry function more or less independently, with their own mandates and controlling structure. Furthermore, a great deal of science is outside this Ministry. This includes, viz DRDO Laboratories, ICAR ICMR Laboratories and activities under various other Ministries, such as Industry, Telecommunication, Broadcasting, Home, Energy etc. Even more important, perhaps, the largest number of scientists and engineers, and research students outside all the above mentioned entities, reside in universities and IITs, Medical and Engineering Colleges.

The major science agencies have primarily put in their resources in their own laboratories. They do have "extra-mural" programmes, and, of late, special projects to support their own activities have been given to a number of universities, but particular strategies for supporting institutions to raise them to levels of effectiveness are still rather weak.

If there is one inference that can be drawn from the efforts of various science and education agencies, it is this: whenever selective strengthening of science and technology infrastructure has been created around good people, the results have been spectacular. This can be specially noticed in regard to some of the support in universities and institutes of Technology through programmes such as those of SERC, the COSIST programme of UGC and others. This has enabled these institutions to quickly take on new ideas and new challenges. This has also helped to educate students in an environment of modern day science. However, the inputs have been small and have touched only a very small fraction of the potential generators of science and technology, including S&T management. SERC and UGC together would have spent no more than 90 crores for this activity in the Seventh Plan, to cover about 150 universities, covering about 6000 colleges. This may be the budget of 6 medium sized laboratories.

A Science Foundation in the United States, for example, can correctly concentrate on these institutions which already have a strong infrastructure and funding support through private income, regional state agencies, private foundations or industry. All these are absent in India. Practically all the support has to come from the central budgetary allocations, supplemented by small resources generated by industrial research laboratories. The support is now managed through very large number of agencies, not only in the area of applied science and engineering but also in basic sciences.

The level of support available to different areas and different entities in various organisations is not very well balanced according to needs or potential. A Science Foundation to look after 50 odd crores within a total which is by orders of magnitude larger may be setting up of too big an infrastructures for doing too little. Though we may ultimately transition in that direction, it would be useful to set up an umbrella structure with a secretariat of 5-6 persons, to collect, collate and analyse the information and give advice and direction to various executive agencies for coordination and filling gaps, and even suggest sharing or reallocation of resources. Its inputs to the Planning Commission every year would be of help. After some experience with this we may pave the ground for setting up a National Science Foundation, which will then encompass all non-mission oriented science, whether in laboratories or universities or government departments or agencies, while keeping in mind the special needs of S&T infrastructure in the educational sector.

The membership of the umbrella structure mentioned above will include all the agencies involved in the support of science and technology and half a dozen unattached distinguished scientists and technologists. The Chairmanship of the body may be in UGC or DST or OSA with its Scientific Secretariat in DST.

DEPARTMENT OF SCIENCE & TECHNOLOGY

Subject: DST Comments on SAC-PM proposal to set up an Autonomous National Agency for funding Science and Engineering Research.

The funding on the country's total S&T programmes is about 1.1% of its GNP and was about Rs.2,870 crores in 1986-87. Out of this amount, roughly Rs.555 crores (19.4%) is spent by Industry. The remaining Rs.2,200 crores is spent by governmental sources, out of which about 50% (viz. Rs.1,100 crores) is accounted for by three major agencies in the country, viz., Atomic Energy, Space and Defence R&D. The remaining 50% amounting to Rs.1,100 crores is accounted for by Agricultural Research, Medical Research, Ocean Research, Bio-technology, Non-conventional Energy Sources, CSIR, DST and the science element of the socio-economic ministries like those dealing with Petrochemicals, Rural Development, Transport etc. The DST share in what may be termed Research grant in thrust area research is of the order of Rs.10 crores in all this. Essentially, for the management of these Rs.10 crores -or thereabout- the SAC-PM proposal is to replace the existing SERC mechanism by an autonomous National Agency. To put the matter in perspective, therefore, the SAC-PM concern, in its present proposal, is not on the qualitative, quantitative, distributive and futuristic aspects of the Rs.2,870 crores that India spends every year on S&T programmes, but on the mere Rs.10 crores that the existing time tested mechanism of SERC gives by way of grants to catalyse the effort on science and engineering; and for these Rs.10 crores which is a mere one third of 1% of our total S&T expenditure, the SAC-PM proposal is to have an elaborate "executive" autonomous "structure" with a full time Executive Director, full fledged board etc.

2 Whom does this "Permanent Executive Structure", proposed by SAC-PM seek to replace? The Science and Engineering Research Council (SERC) whose 1980-87 Activities Report is enclosed. Since its formation in 1975, SERC supported over 1,200 research projects (a large proportion of this in our academic institutions), spent cumulatively about Rs.65 crores (a large portion of this again in our academic and university system), covered about 2,000 scientists/engineers in the country and has sustained some world class individuals. The SERC members, who serve on every 3 year term with the approval of the Prime Minister, since its inception in 1975, is ~~given~~ ^{listed} on pages 66-69 of the enclosed Report. Every eminent scientist of the country has served on SERC or its Programme Advisory Committees at least two 3 year terms.

3 More importantly with only a secretariat of 20 persons, a comprehensive system of peer evaluation involving a number of eminent individuals from the country - laboratories, academia & industry - has been established. A brief overview of the system & vital statistics are given pictorially in the enclosed Report. The system is considered unique and exemplary by most scientists/engineers whose appreciation on the way of its professional functioning we receive every day.

A specimen, as representative of the general view on the effectiveness of SERC, is given in the Annexure. It is from the President, Indian National Science Academy (Prof. M.M. Sharma) and is abstracted below:

" I was most delighted to receive your letter and the report of the SERC during the period 1980-87. First of all I should like to congratulate you and the DST and all the officers who have been associated with the SERC for doing a splendid job. SERC has provided yeoman services to the Scientific Community in India and has transformed, in a radical way, the entire funding pattern. The DST can certainly be self-congratulatory in this very fine endeavour."

4 It may kindly be noted that the above system from its inception (since 1975) is well established and there are no perturbations despite Secretary-level changes for about half-a-dozen times. It goes to prove the basic independence of the system of the extramural funding established in DST. The fact that some 20 professionals could service the system is because the infrastructure is provided by DST as a whole which deals with other matters ranging from scientific services like meteorology and surveys to inter-ministerial coordination matters pertaining to S&T, including international co-operation. There is also an additional merit that these 20 odd professionals enrich other activities of DST through their experience and contacts with a number of national experts. Such organic linkages, in my opinion, are extremely necessary to make funding of basic research relevant to other needs of the country. For example, when DST deals with Entrepreneurship Development or Science Popularisation or State S&T Councils or Industrial Interfacing through Scientific and Technical Advisory Committees, the overall corporate experience flows to the basic research funding groups and vice versa. This is what has made other agencies like Space, Atomic Energy, DRDO, Electronics, Biotechnology etc., to make their own extramural funding programme as a part of their overall corporate activity since necessary organic linkages are absolutely imperative. The most disturbing part of the SAC-PM proposal is to make this mechanism totally devoid of these vital organic links and isolate it in a "Permanent Executive Structure". Such an "executive" oriented "autonomous" structure will tend to remain deprived of science nurturing ethos and will be negating what has taken many years to build. When SAC-PM proposes to replace the existing mechanisms by a National Science Foundation (NSF) kind of model of the USA, what would seem to be overlooked is the fact that in the US most of the R&D funding is done by private industry and therefore they feel the need of governmental support to some basic research, whereas in India the funding is over 80% from the governmental sources. And of course, this minor proportion of the total funding channeled through NSF in USA runs through several thousand crores as against the meagre Rs.10-15 crores that SAC-PM is proposing replacement for by an NSF kind alternative mechanism.

5 A general exchange of experience and information and through this broad coordination among the various extramural funding

agencies does take place in our various forums periodically. DST also brings out periodic updated documents informing about the extramural funding in the country to benefit all the research workers and funding agencies. Considering the whole lot of our experience so far and also considering the vital needs for making basic research in the country more relevant to national needs, I firmly hold the view that various Scientific Departments should continue their own extramural funding programme and DST should continue the major funding the programme as it has been doing so far. When the expenditure on S&T is increased in the country as desired by PM, the amount for the programmes for Extramural Funding of Science & Engineering Research should be at least doubled in the next few years. I would submit that we should not tinker with the existing time-tested mechanisms & systems for funding extramural research but develop mechanisms and systems for making it attractive for industry, including the services sector, to invest in S&T activities and also to develop closer linkages between our already established R&D infrastructure and the real utility ends, viz., industry, services and the socio-economic sectors.

Vasant Gowariker

(Vasant Gowariker)

Secretary, DST

7-2-1989

Uc No DST/PS/171/89
dt 8/2/89

1. Chairman & Members, Empowered Group
2. Secretaries, Scientific Departments
3. Chairman & Members, SAC - PM
4. SA to PM
5. Chairman, UGC

SERC - NOTABLE CONTRIBUTIONS

ANNEX
(A note from
Prof MM Ghosh)

The DST has definitely made a major impact on support for research in Universities / IIT's / Institutes of Science, etc. There is a dramatic change in the attitude of scientists in undertaking problems having great academic excitement and involving sophisticated instruments. We can witness a sea change in the research scenario in all types of teaching and research establishments which have received support from the DST. The number of research publications in very renowned journals has substantially increased and this research work has brought laurels to Indian Scientists. Thus the DST has provided yeomen services at a critical juncture in promotion of science in India.

Many innovative ideas have been conceived and successfully introduced. The DST has succeeded admirably in bringing together scientists from all organisations and has established an enviable reputation. The so-called Baroda seminars have no parallel. The constitution of PAC is unique and the system of inviting scientists to make presentation of their proposals is a novel concept. The method of inviting scientists for a discussion before finalising the approval is highly commendable. A large number of young scientists have immensely benefited from various schemes of the DST.

The rigorous system of monitoring progress of research work has instilled in the mind of scientists a sense of commitment and an element of joy in creative satisfaction by way of accomplishments and appreciation by peers.

The applied scientists in the University system no longer feel stifled that they will not have opportunities to pursue challenging problems which have an academic punch and practical relevance.

The creation of some vital core facilities, RSIC, etc. has provided a system through which a large number of scientists can benefit in a way basically free from bureaucracy.

The DST support is more scientist oriented rather than administration oriented and deserves to be praised for nurturing this culture.

M. M. SHARMA, FNA
Professor of Chemical Engineering

University of Bombay



Tel. Nos. :

484306, 484556, 484637, 484689, 4848

DEPARTMENT OF CHEMICAL TECHNOLOGY
MATUNGA, BOMBAY 400 019, INDIA

16 January 1989

cc/mm/614

Your Ref.No.DO No.SP/S9/Z60/89 dt. 5-1-89

SERC

My dear Dr.Gowariker,

I was most delighted to receive your letter and the report of the SERC during the period 1980-87. First of all I should like to congratulate you and the DST and all the officers who have been associated with the SERC for doing a splendid job. SERC has provided yeomen to the services / Scientific Community in India, ^{and} has transformed, in a radical way, the entire funding pattern. The DST can certainly be self-congratulatory in this very fine endeavour.

With kind regards,

Yours sincerely,

A handwritten signature in black ink, appearing to be 'Vasant'.

Dr.Vasant Gowariker,
Secretary,
Government of India,
Ministry of Science & Technology,
Department of Science & Technology,
Technology Bhavan,
New Mehrauli Road,
NEW DELH I-1100016.

DEPARTMENT OF SCIENCE AND TECHNOLOGY

The US Ambassador called on me last week for a general discussion on INDO-US S&T Cooperation. Among other things, he fondly recalled his old association with the setting up of IIT, Kanpur in the early sixties with US assistance. As one who firmly believes that a country of India's size and stature must have several tens of IIT-like institutions, I inquired as to how US would respond to the idea of recreating history, if India were to think in terms of yet another IIT like institution. His response was overwhelmingly positive.

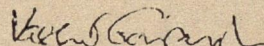
PM may recall that the last IIT was established over two decades ago and the sixth one is being set up in Assam pursuant to the Accord. I feel that the new IITs should not be mere teaching institutions; they should harmonise our aspiration to put S&T infrastructure to use in evolving technologies to meet massive national needs. Therefore, the stress for the new IITs should be 'on-the-job', 'hands-on' innovative design-development - productionising apprenticeship on programmes for conversion of feasible concepts into tangible products, industry or services with "on-campus" innovative experimental and teaching modules. The new institutions should thus encompass the whole cycle of idea conception, R&D, training, testing to market - and produce a new breed of youngsters to make India technologically forward looking.

It may, therefore, be seen that the Indian programming effort on the creation of the new institute has to perceive it as more than merely establishing a yet another IIT or teaching institute, and certainly more than an exercise in seeking aid or hardware.

In USA similar innovative institutions & arrangements have been attempted and experimented with. I feel that it would be worthwhile to draw on the experience and talent of such creative individuals in US in order that they join the counterpart Indian talent in conceptualising a new national Indian institute.

To spark off the process of the above kind of new "IITs", a different kind of imaginative lead would be necessary and DST would like to undertake it. I also feel that a most fitting tribute to Jawaharlal Nehru in this Centenary Year would be by having this very novel institute in Allahabad and naming it as "Jawaharlal Nehru Institute of Industrial Technology" in memory of the person who did so much for Indian Science.

PM's approval is sought to the concept so that I can work out details in consultation with all concerned, including the US side, & prepare a Cabinet paper. One guesstimate of the cost is around Rs 500 crores - the most of which may be attempted to be received as grant from the US. I could propose a plan of action, after getting PM's reaction.


(Vasant Gowarikar)
Secretary
19.7.1989.

MOS (S&T)

Prime Minister

प्रधान मंत्री की विज्ञान सलाहकार परिषद
Science Advisory Council to the Prime Minister



प्रो. सी. एन. आर. राव
अध्यक्ष
Prof. CNR Rao
Chairman

भारतीय विज्ञान संस्थान
बंगलोर 560 012
Indian Institute of Science
Bangalore 560 012

Confidential

DIR.S.31 (L.40)
18th July 1989

Dear Mr. Seshan,

Sub: Follow-up of Empowered Group Discussions on
National Science and Engineering Research
Board (NSERB)

I have just received a copy of the proposal sent to you by Dr. Gowariker. The SAC to PM has studied the umbrella structure for funding science and engineering research proposed by Dr. Gowariker. We find that this is not actually a structure for funding science and engineering research but a structure to analyse what is happening today. We believe that this exercise is unnecessary. There is little that we do not know and there is no real need to analyse the situation with research funding now. Clearly, multiple sources should be available for research funding. What the SAC to PM has suggested was to establish a new structure which is strong and is commensurate with the size of the country and the total scientific effort being made. We believe that the scientific research funding should not be one of the minor activities of a government department. It should be done by a ^{major} ~~proper~~ autonomous agency staffed by academics and other professionals who work there on a full-time or part-time basis. Furthermore, the National Science & Engineering Research Board (NSERB) proposed by us would not merely fund research but would also take all other measures necessary to promote high level scientific research activity in the country. The Board will keep constant vigil to find out where we are behind and where we need new thrusts. This is in fact what the National Science Foundation in the United States does. The functions of the NSF mentioned in the write-up of Dr. Gowariker in this context are not indicative of the vital role played by this agency. NSF does much more than simply fund research. We are hoping that the proposed National Science & Engineering Research Board, if and when established, would really provide a great boost to fundamental research in India. The NSERB will also bring out a report on the national science indicators annually.

Dr. Gowariker has stated that such a Board may involve too much efforts considering the modest funding

Secretary

451-C

Diary No.

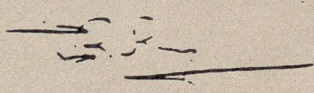
Date. 21-7-89

that we provide today. This may not be entirely true because we have just heard from the Prime Minister's Office that the funding is expected to be increased to 30 crore rupees or more per annum from now on. If so, the establishment of such a Board would certainly be justified. Furthermore, we are not suggesting a very large structure for the NSERB. What we are suggesting is a Scientific Advisory Council and an Executive Body. The Executive Body would have various subject groups chaired by expert scientists and engineers. Each subject group will have active scientists and engineers advising on how best to fund and promote activities in that area. In addition, the Executive Body would have full-time staff in the form of a Secretariat.

It is the feeling of SAC-PM that it would be ideal if Dr. Gowariker would kindly take some time to discuss the proposal with SAC-PM and see if he can himself take the necessary initiative from the DST to establish such a Board, especially since increased funding for fundamental research may become available in the 8th Plan.

With warm personal regards and best wishes,

Yours sincerely,



Mr. T.N. Seshan
Cabinet Secretary
Cabinet Secretariat
Rashtrapathi Bhawan
NEW DELHI 110 004

✓
c.c.: Dr. Vasant Gowariker, Secretary, Deptt. of Science &
Technology, Technology Bhavan, New Delhi-11016.

In lieu of National S&T Commission or Committee (NSTCC), recommended by SAC to PM, more appropriate and effective method would be to have a matrix-management system apexed at a Special Committee of the Cabinet on S&T Utilisation chaired by the Prime Minister.

COMPOSITION:

Prime Minister	Chairman
Minister, Industry	Member
Minister, Planning	Member
Minister, Commerce	Member
MOS (S&T)	Member

Standard List of officials to attend:

P.S. to P.M.

Cabinet Secretary

Secretary, Industry

Secretary, Planning

Secretary, Commerce

Secretary, DST

- Formal secretariat will be the Cabinet Sectt.

- Technical secretariat which will prepare papers etc will be DST.

No additional post etc.

NOTE Other Secretaries & Scientists will be requested to attend specific meetings as necessary.

Key technologies: Who's ahead

Type of Technology	Present rank			Expected rank in 2000		
	U.S.	Europe	Japan	U.S.	Europe	Japan
New Industrial materials						
High-temperature superconductor.....	1	3	2	1	3	2
Nonlinear opto-electronic materials.....	1	3	2	1	3	2
Ferromagnetic materials.....	2	3	1	2	3	1
Molecular functional materials.....	1	2	2	1	3	2
Durable, advanced composite materials.....	1	2	2	1	3	2
New alloys and intermetallic compounds.....	1	3	2	1	3	2
Fine ceramics.....	1	3	2	2	3	1
New function carbon-based materials.....	1	3	2	1	3	1
New function amorphous glass materials.....	1	3	2	1	3	2
High-purity fine polymers.....	1	3	2	1	3	2
Silicon-based materials.....	1	2	2	1	3	2
New microelectronic materials.....	1	3	2	1	3	2
Electronics						
Superconducting devices.....	1	3	2	1	3	1
Quantum effect devices.....	1	3	2	1	3	2
Power-electronics devices.....	1	3	2	1	3	2
New function optical devices.....	1	3	2	1	3	2
Large circuit devices.....	1	3	2	1	3	1
Biotechnology						
High-performance enzymes and biomaterials.....	1	2	3	1	3	2
Animal and plant cell engineering.....	1	2	2	1	3	2
New types of genetic engineering.....	1	2	3	1	2	2
Biomaterial databanks.....	1	2	3	1	2	3
Screening and isolation of genes from bacteria, animal and plant cells.....	1	2	3	1	2	3

Notes: 1) a denotes fields where newly industrializing economies are catching up. 2) The 47 technologies were selected based on the "Sangyo Gijutsu no Doko to Kado" (White Paper on Industrial Technology) issued by the Ministry of International Trade and Industry in Sept. 1988.

Type of Technology	Present rank			Expected rank in 2000		
	U.S.	Europe	Japan	U.S.	Europe	Japan
Advanced know-how for utilizing bioreactions.....	1	2	3	1	2	2
Precision atomic handling know-how.....	1	2	2	1	2	2
New fabrication process technologies for metals and inorganic materials.....	1	2	3	1	2	2
Precision molecular alignment technology.....	1	2	3	1	2	2
Evaluation, analysis and measurement know-how.....	1	2	2	1	2	2
Design and simulation know-how.....	1	3	2	1	3	2
Photoreaction process know-how.....	1	2	2	1	2	2
Processing know-how using unusual conditions, like microgravity, high pressures, etc.....	1	2	3	1	2	2
Biomaterials						
Biomimetic materials.....	1	3	2	1	3	1
Biocompatible materials.....	1	3	2	1	3	2
Biochemical know-how.....	1	3	2	1	3	2
Bioprocessing.....	1	2	2	1	2	2
Bioelectronics						
Techniques for protein alignment.....	1	2	3	1	2	3
Technology for utilizing biomembranes.....	1	2	3	1	2	3
Analysis system of bio-related materials.....	1	2	2	1	3	2
Computer software, system engineering						
Self-organized data-processing systems.....	1	3	2	1	3	2
Self-organized neural data-processing systems.....	1	2	3	1	2	2
Ultraparallel processing architecture.....	1	3	2	1	3	2
Integrated software for mechanical control.....	1	3	2	1	3	2
Software development know-how.....	1	3	2	1	3	2
Disaster prevention know-how.....	1	3	2	1	3	1
Environment control know-how.....	1	3	2	1	3	1
Human-related technology.....	1	2	2	1	3	2
Resources and energy know-how.....	1	2	3	1	3	2
Advanced robotics know-how.....	2	3	1	2	3	1

Japan Economic Journal Week ending March 11, 1989

प्रधान मंत्री की विज्ञान सलाहकार परिषद
Science Advisory Council to the Prime Minister



प्रो. सी. एन. मार. राव
अध्यक्ष
Prof. CNR Rao
Chairman

भारतीय विज्ञान संस्थान
बंगलूर 560 012

Indian Institute of Science
Bangalore 560 012

By Speed Post

DIR. S. 31 (G.8)
6 September 1989

Dear Shri Rajivji:

AUTONOMY OF SCIENCE AND TECHNOLOGY ORGANISATIONS

As per the Terms of Reference you have given to our Council, we have been looking at a number of issues which affect the health of Science in India. It is well recognised now that if a scientific organisation has to carry out high quality research and development activities, it requires to have certain amount of autonomy and flexibility in its day to day functioning. To perform scientific research, one needs to have mechanisms which would quickly respond to new developments in the world. We are concerned with some of the problems which are being faced by members of the Indian scientific community in some of our important scientific organisations, and we thought of bringing these to your notice.

The need for functional autonomy of scientific organizations has been recognised in the past and the erstwhile Science Advisory Committee to the Cabinet (SACC) had discussed a number of issues pertaining to simplifying administrative procedures and delegating enhanced powers to the Science and Technology organisations. The recommendations of the SACC were accepted by the Government and two major orders were issued in December 1983 and May 1986 (a copy each enclosed) which aimed at the promotion of a proper atmosphere in the scientific organisations so that scientists could function more efficiently. The aspects which were involved in simplifying the procedure were: (i) Enhanced financial powers; (ii) Exemption from the purview of UPSC, CPWD, DGS&D and SIU etc.; (iii) Introduction of flexible complementing scheme; (iv) Creation of posts when required etc. Several


contd...

institutions to which these orders would be applicable had also been identified. While some of the institutions and S&T organisations have utilised these simplified procedure, we are concerned that a number of major autonomous scientific institutions in the country, (for example, AIIMS, IARI, IVRI, NDRI etc.) which are under the purview of the Ministry of Health and the Ministry of Agriculture have unfortunately not yet implemented these recommendations. Of late, a number of references have been made to us by the members of the scientific community who find that their work is hampered as a result of the non-implementation of these recommendations. Serious procedural difficulties have been faced by some scientists in attending even recognized international conferences.

We feel that your intervention may be necessary in ensuring that the Minister of Health and the Minister of Agriculture take the necessary measures to provide functional autonomy to the research organisations and institutions under these Ministries as per the decisions already taken by the Government and where orders have already been issued. This will also have to be taken up with other ministries where the institutions under their control have been declared as S&T organisations but which have not yet been given this autonomy. If the concerned Ministries could take up this matter with the administrative machinery of these autonomous institutions, we feel that the atmosphere for scientific research in these institutions would improve considerably. We do hope that you share with us this concern of the scientific community working in these organisations. We feel that through such measures, we would be able to make considerable improvement in the health of science in India.

With warm personal regards,

Yours sincerely,


C.N.R. RAO

Shri Rajiv Gandhi
Prime Minister of India
South Block
NEW DELHI 110 011

Encls:

→ cc: Dr. P. J. Lavakare
Secretary, SAc-PM

SCIENCE ADVISORY COUNCIL TO THE PRIME MINISTER

MINUTES OF THE 44TH MEETING OF THE SCIENCE ADVISORY COUNCIL
TO THE PRIME MINISTER HELD ON SEPTEMBER 11, 1969
AT DST, NEW DELHI

Following were present in the meeting:

1.	Prof. CNR Rao	Chairman
2.	Prof. VL Chopra	"
3.	Dr. AS Ganguly	"
4.	Shri Sam Pitroda	"
5.	Prof. JV Narlikar	"
6.	Dr. Sekhar Raha	"
7.	Dr. P. Rama Rao	"
8.	Dr. RA Mashelkar	"

Dr. P.N. Tandon, Prof. R. Narasimha and Prof. Madhav Gadgil could not attend the meeting.

Shri V. Krishnamurthy was specially invited for Agenda Item No.5.

Dr. P.J. Lavakare, Secretary, SAC-PM, Dr. B. Hari Gopal and Mrs. Shashi Ahuja attended the meeting from the Secretariat.

2. Before taking up the agenda, Chairman wanted to finalise the dates of the future meeting of SAC-PM. These are as follows:

45th Meeting	October 16, 1969	At DST, Delhi at 9.30 a.m.
46th Meeting	November 10, 1969	At Bhopal at 11 a.m.
47th Meeting	December 7, 1969	At IISc., Bangalore at 9.30 a.m.

ITEM NO.1 CONFIRMATION OF THE MINUTES OF THE 43RD MEETING
OF SAC-PM

3. Minutes of the 43rd Meeting were confirmed.

ITEM NO.2

FOLLOW-UP ACTION ON THE DECISIONS TAKEN AT THE
43RD MEETING

4. Following developments were reported:

(i) The members were informed that the SAC-PM recommendations on silicon development in the country would be discussed at the meeting of the Empowered Group to be held in the afternoon of September 11, 1989.

(ii) On the status of the publication of the SAC-PM activities, members were given copies of the draft outline of the proposed report and they were requested to give their comments to the Secretariat within the next 10 days. It was also decided to add a chapter on Technology Missions for which Shri Sam Pitroda would be giving the necessary write-up which would be edited suitably by Secretary, SAC-PM.

(Action: Shri Sam Pitroda
& other members
and
Secretary, SAC-PM)

(iii) On the autonomy for research organisations, Chairman, SAC-PM, has already sent a letter to the Prime Minister, copy of which is given at annexure-I.

ITEM NO.3:

MEETING WITH PRIME MINISTER: CONSIDERATION
OF AGENDA AND PRESENTATION

5. Members were informed that the proposed meeting with the Prime Minister, which was requested for September 11, 1989, would have to be postponed. When the next date is announced, the agenda item will be considered.

.....3/-

ITEM NO.4 NATIONAL SAFETY AUTHORITY

6. The Council considered the proposal of setting up the National Safety Authority and felt that while the word 'Safety' may not be appropriate, considering the various issues dealing with Science, Technology, Environment and Ecology, there is a need for a body which will consider various policy alternatives which could be outlined for the consideration of the Government depending upon these developments. A specific case in point related to the Global Warming phenomenon, which needs to be considered at the highest level to work out various policy alternatives for industrial development and choice of imported technology and various international protocols in which India is expected to participate. It was, therefore, proposed that the need for a National Authority on Policy Alternatives - Science, Environment and Ecology (NAPA-SEE) could be recommended for setting up. Chairman was requested to convey the views of SAC-PM to the PM accordingly.

(Action: Chairman, SAC-PM)

ITEM NO.5 FUNCTIONING OF TECHNOLOGY INFORMATION FORECASTING AND ASSESSMENT COUNCIL (TIFAC)

7. Shri V. Krishnamurthy gave a detailed account of the activities of TIFAC carried out during the last year. He observed that while TIFAC was set up two years ago, the actual functioning of TIFAC had only started about a year ago and to that extent, several areas of activities of TIFAC have not yet been covered. He, however, highlighted the role played by TIFAC in setting up a data base in the form of TIFACLINE. He emphasised the need for

....4/-

prioritisation of areas so that specific impact could be made by TIFAC and he suggested the possibility of selecting few sectors as relevant to the 8th Five Year Plan. Commenting on the efforts of TIFAC on petrochemicals, using the IPCL - IIM Study, he felt that more work would have to be done before specific policy guidelines could be issued. Unfortunately, he observed that qualified people were not available to carry out such a study. He also indicated the initiatives taken by TIFAC in the areas of Housing, Materials and Electronics. He once again emphasised that TIFAC has not had enough time to show its impact but he was hoping that in the near future, TIFAC would become an instrument in shaping the national policy as regards technology and development of industry was concerned.

B. Members raised several questions relating to the functioning of TIFAC based on the comments received from various members and the Secretariat. It was also felt that awareness about TIFAC amongst the industry and other users was not there and this has to be achieved through conscious efforts by TIFAC, where through open debates, the role and functioning of TIFAC could be widely disseminated. There were number of questions relating to the role of TIFAC and its importance to industry. Members were concerned that studies of TIFAC must influence the Government in defining specific policy for technology development and imports. Comparisons were made with international organisations like MITI of Japan where efforts were to support long-term R&D projects relevant to industrial growth. Shri Krishnamurthy, in conclusion, requested members to have more such periodic meetings so that

-: 5 :-

TIFAC could get general guidelines for its future functioning from time to time. Based on these discussions, Chairman, SAC-PM, agreed to send the recommendations to PMD on the report of functioning of the TIFAC.

(Action: Chairman, SAC-PM)

6. A Standing Committee mechanism with PM, MOS(S&T) and Secretary, DST as the core with concerned Minister & Joint Secretary concerned with the programme of the Dept., under review as members --Secretary, DST to present to PM the operational details of the High Level Review process along with relevant details of STAC. SECY.DST

PM further observed that the task of introducing SET in all walks of life in India requires a number of steps such as orientation in the SET agencies; STACs; persuasive horizontal interactions; induction of proper personnel in the government systems; administrative reforms and so on. It also requires a political dimension to sustain & fructify the work done at other levels. He therefore felt that the induction of SET by socio-economic Ministries should be overseen by a Standing Committee mechanism with the Prime Minister, MOS (S&T) and Secretary DST as the core with the concerned Minister & the Joint Secretary concerned with programme of the Department under review as members. PM felt that this kind of review along with the STAC/IS-STAC reviews would make the high level status assessment process meaningful. He desired Secretary, DST to pursue the idea further and give PM a presentation on the operational details of the High Level Review process along with relevant details of STAC. (t)

(Action: DST)

प्रधान मंत्री को विज्ञान सलाहकार परिषद
Science Advisory Council to the Prime Minister



प्रो. सी. एन. मार. राव
मध्य
Prof. CNR Rao
Chairman

भारतीय विज्ञान संस्थान
बंगलूर 560 012

Indian Institute of Science
Bangalore 560 012

By Speed Post

DIR. S. 31 (G.8)
6 September 1989

Dear Shri Rajivji:

AUTONOMY OF SCIENCE AND TECHNOLOGY ORGANISATIONS

As per the Terms of Reference you have given to our Council, we have been looking at a number of issues which affect the health of Science in India. It is well recognised now that if a scientific organisation has to carry out high quality research and development activities, it requires to have certain amount of autonomy and flexibility in its day to day functioning. To perform scientific research, one needs to have mechanisms which would quickly respond to new developments in the world. We are concerned with some of the problems which are being faced by members of the Indian scientific community in some of our important scientific organisations, and we thought of bringing these to your notice.

The need for functional autonomy of scientific organizations has been recognised in the past and the erstwhile Science Advisory Committee to the Cabinet (SACC) had discussed a number of issues pertaining to simplifying administrative procedures and delegating enhanced powers to the Science and Technology organisations. The recommendations of the SACC were accepted by the Government and two major orders were issued in December 1983 and May 1986 (a copy each enclosed) which aimed at the promotion of a proper atmosphere in the scientific organisations so that scientists could function more efficiently. The aspects which were involved in simplifying the procedure were: (i) Enhanced financial powers; (ii) Exemption from the purview of UPSC, CPWD, DGS&D and SIU etc.; (iii) Introduction of flexible complementing scheme; (iv) Creation of posts when required etc. Several

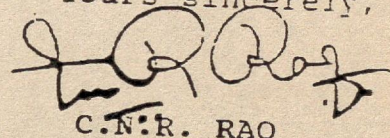
contd...

institutions to which these orders would be applicable had also been identified. While some of the institutions and S&T organisations have utilised these simplified procedure, we are concerned that a number of major autonomous scientific institutions in the country, (for example, AIIMS, IARI, IVRI, NDRI etc.) which are under the purview of the Ministry of Health and the Ministry of Agriculture have unfortunately not yet implemented these recommendations. Of late, a number of references have been made to us by the members of the scientific community who find that their work is hampered as a result of the non-implementation of these recommendations. Serious procedural difficulties have been faced by some scientists in attending even recognized international conferences.

We feel that your intervention may be necessary in ensuring that the Minister of Health and the Minister of Agriculture take the necessary measures to provide functional autonomy to the research organisations and institutions under these Ministries as per the decisions already taken by the Government and where orders have already been issued. This will also have to be taken up with other ministries where the institutions under their control have been declared as S&T organisations but which have not yet been given this autonomy. If the concerned Ministries could take up this matter with the administrative machinery of these autonomous institutions, we feel that the atmosphere for scientific research in these institutions would improve considerably. We do hope that you share with us this concern of the scientific community working in these organisations. We feel that through such measures, we would be able to make considerable improvement in the health of science in India.

With warm personal regards,

Yours sincerely,



C.N.R. RAO

Shri Rajiv Gandhi
Prime Minister of India
South Block
NEW DELHI 110 011

Encls:

→ CC: Dr. P. J. Lavakare
Secretary, SAc-PM

SCIENCE ADVISORY COUNCIL TO THE PRIME MINISTER

MINUTES OF THE 44TH MEETING OF THE SCIENCE ADVISORY COUNCIL
TO THE PRIME MINISTER HELD ON SEPTEMBER 11, 1989
AT DST, NEW DELHI

Following were present in the meeting:

- | | | |
|----|-------------------|----------|
| 1. | Prof. CNR Rao | Chairman |
| 2. | Prof. VL Chopra | " |
| 3. | Dr. AS Ganguly | " |
| 4. | Shri Sam Pitroda | " |
| 5. | Prof. JV Narlikar | " |
| 6. | Dr. Sekhar Raha | " |
| 7. | Dr. P. Rama Rao | " |
| 8. | Dr. RA Mashelkar | " |

Dr. P.N. Tandon, Prof. R. Narasimha and Prof. Madhav Gadgil could not attend the meeting.

Shri V. Krishnamurthy was specially invited for Agenda Item No.5.

Dr. P.J. Lavakare, Secretary, SAC-PM, Dr. B. Hari Gopal and Mrs. Shashi Ahuja attended the meeting from the Secretariat.

2. Before taking up the agenda, Chairman wanted to finalise the dates of the future meeting of SAC-PM. These are as follows:

45th Meeting	October 16, 1989	At DST, Delhi at 9.30 a.m.
46th Meeting	November 10, 1989	At Bhopal at 11 a.m.
47th Meeting	December 7, 1989	At IISc., Bangalore at 9.30 a.m.

ITEM NO.1 CONFIRMATION OF THE MINUTES OF THE 43RD MEETING
OF SAC-PM

3. Minutes of the 43rd Meeting were confirmed.

....2/-

ITEM NO.2

FOLLOW-UP ACTION ON THE DECISIONS TAKEN AT THE
43RD MEETING

4. Following developments were reported:

(i) The members were informed that the SAC-PM recommendations on silicon development in the country would be discussed at the meeting of the Empowered Group to be held in the afternoon of September 11, 1989.

(ii) On the status of the publication of the SAC-PM activities, members were given copies of the draft outline of the proposed report and they were requested to give their comments to the Secretariat within the next 10 days. It was also decided to add a chapter on Technology Missions for which Shri Sam Pitroda would be giving the necessary write-up which would be edited suitably by Secretary, SAC-PM.

(Action: Shri Sam Pitroda
& other members
and
Secretary, SAC-PM)

(iii) On the autonomy for research organisations, Chairman, SAC-PM, has already sent a letter to the Prime Minister, copy of which is given at annexure-I.

ITEM NO.3:

MEETING WITH PRIME MINISTER: CONSIDERATION
OF AGENDA AND PRESENTATION

5. Members were informed that the proposed meeting with the Prime Minister, which was requested for September 11, 1989, would have to be postponed. When the next date is announced, the agenda item will be considered.

.....3/-

ITEM NO.4 NATIONAL SAFETY AUTHORITY

6. The Council considered the proposal of setting up the National Safety Authority and felt that while the word 'Safety' may not be appropriate, considering the various issues dealing with Science, Technology, Environment and Ecology, there is a need for a body which will consider various policy alternatives which could be outlined for the consideration of the Government depending upon these developments. A specific case in point related to the Global Warming phenomenon, which needs to be considered at the highest level to work out various policy alternatives for industrial development and choice of imported technology and various international protocols in which India is expected to participate. It was, therefore, proposed that the need for a National Authority on Policy Alternatives - Science, Environment and Ecology (NAPA-SEE) could be recommended for setting up. Chairman was requested to convey the views of SAC-PM to the PM accordingly.

(Action: Chairman, SAC-PM)

ITEM NO.5 FUNCTIONING OF TECHNOLOGY INFORMATION FORECASTING AND ASSESSMENT COUNCIL (TIFAC)

7. Shri V. Krishnamurthy gave a detailed account of the activities of TIFAC carried out during the last year. He observed that while TIFAC was set up two years ago, the actual functioning of TIFAC had only started about a year ago and to that extent, several areas of activities of TIFAC have not yet been covered. He, however, highlighted the role played by TIFAC in setting up a data base in the form of TIFACLINE. He emphasised the need for

....4/-

prioritisation of areas so that specific impact could be made by TIFAC and he suggested the possibility of selecting few sectors as relevant to the 8th Five Year Plan. Commenting on the efforts of TIFAC on petrochemicals, using the IPCL - IIM Study, he felt that more work would have to be done before specific policy guidelines could be issued. Unfortunately, he observed that qualified people were not available to carry out such a study. He also indicated the initiatives taken by TIFAC in the areas of Housing, Materials and Electronics. He once again emphasised that TIFAC has not had enough time to show its impact but he was hoping that in the near future, TIFAC would become an instrument in shaping the national policy as regards technology and development of industry was concerned.

B. Members raised several questions relating to the functioning of TIFAC based on the comments received from various members and the Secretariat. It was also felt that awareness about TIFAC amongst the industry and other users was not there and this has to be achieved through conscious efforts by TIFAC, where through open debates, the role and functioning of TIFAC could be widely disseminated. There were number of questions relating to the role of TIFAC and its importance to industry. Members were concerned that studies of TIFAC must influence the Government in defining specific policy for technology development and imports. Comparisons were made with international organisations like MITI of Japan where efforts were to support long-term R&D projects relevant to industrial growth. Shri Krishnamurthy, in conclusion, requested members to have more such periodic meetings so that

TIFAC could get general guidelines for its future functioning from time to time. Based on these discussions, Chairman, SAC-PM, agreed to send the recommendations to PMO on the report of functioning of the TIFAC.

(Action: Chairman, SAC-PM)

I SHRI PITRODA's ACTIVITIES

- * C-DOT
- * Technology Missions
- * Various Councils/Committees etc
- * Talks/lectures
- * Picking up of good people (from India & abroad)
- induce them for good work in India.
- * Generating new programme e.g. Standard
Tools, Ten Point Employment Generation etc.

II In order that the NEW CULTURE succeeds and
takes roots in our system, it is essential all the above
SUCCEED AND ALSO APPEAR TO SUCCEED.

III SPECIAL PLAN OF ACTION

- * Under normal circumstances regular sustained
work would do.
- * The reality that the "established system"
will not only create hurdles but also spread
"whispers of superficiality and spreading
thin etc" has to be taken note of.

IV SUGGESTIONS GIVEN BELOW ARE MADE WITH THESE
IN MIND:

C-DOT

C-DOT should continue to outshine others -- at least for next 3-4 years. To keep the vigour & vitality some new activities are to be undertaken -- even some efforts at pseudo-change is necessary to; keep it from becoming routine run-of-the mill.

TECHNOLOGY MISSIONS:

- * Efforts will be made to say that the achieved targets are inflated figures.
- * "the Missions work through the usual bureaucracy and they; do the usual laundering" this will be the judgement of the techno-bureaucrats.
- * Therefore on Technology Missions the success should be highlighted at various levels. How actual targets are checked should be brought out.
- * To counter stories of Pitroda spreading thin at various levels one has to highlight how a system is developing to execute & monitor Technology Missions, requiring less and less of the Prime Mover.

- * There will also be a "subtle" propaganda that no great S&T input has gone into the Technology Missions. They are just routine digging; distributing funds; etc. Countering this should probably be done by making many aware that correct technologies are used. Some of the problems of the old S&T establishments also be brought out, subtly.

VARIOUS COUNCILS & COMMITTEES

- * Can perhaps consider which one to "drop out of".
- * For other Councils with "big-wigs" better to attend regularly; whenever absent send written note or telex etc. (even a "commissioned" note).

TALKS & LECTURES

- * Can be reduced
- * Make it around progress of Technology Missions & specific action programmes.

PICKING UP OF GOOD PEOPLE

- * Today many good people are trying to get

into the system due to SGP. They have numerous personal hurdles & institutional hurdles.

- * By special executive order or through some mechanism retain a whole set of lodging facilities for them to stay.
- * Also ensure a follow up mechanism that they are "transitioned" into the system.
- * It may be necessary to build a few new institutions. They will give the organisational support for the programmes & people selected by SGP. Perhaps an innovative mechanism would be to "spot" a few in already existing organisation and with suitable executive orders transfer them with posts to these new institutions. In this way no new posts are created for the Government; but SGP gets right people. They cannot contribute from the earlier institutions because of the already entrenched "techno-bureaucracy"-- the institutions (means higher ups) want to take credit and so on. There will be resistance to this process from the "established system"; but if such a group of persons are not gathered, effective implementation of ideas of SGP will not be possible.

GENERATING NEW PROGRAMMES

- * Excellent ideas (action oriented programmes) emerge from SGP's talks etc.
- * If not implemented concretely these become points of ridicule or snide-remarks for the entrenched hierarchy. "The usual cliché" "talk - talk" only etc.
- * This is where multi-pronged approach is necessary; the strengthening of C-DOT to take up some of these actions; strengthening technology mission directorates; carving out some niche in willing S&T agencies by identifying people to follow up; making nucleus of people around some selected people as described under PICKING UP GOOD PEOPLE; etc.
- * SUCCESS in a few such programmes will silence others. NEW CULTURE can sustain.

CONFIDENTIAL

DEPARTMENT OF SCIENCE & TECHNOLOGY

Subject: Standing Working Group on Intellectual Property Rights Issues concerning International S&T Cooperation.

.....

Earlier a note on the subject suggesting certain actions was approved by MOS regarding further action on Standing Working Group (see Flag 'A'). Subsequently, we have obtained a detailed note (on IPR related issues and our stand vis-a-vis US) from the Ministry of Industrial Development (Flag 'B'). The note covers patents, trademarks, copyright, protection of integrated circuit and protection of trade secrets. This has been written in simple language for general information and education and, therefore, it does not use legalistic expressions. For precise wording and interpretation of law, reference should be made to the respective laws, namely, the Patent Act, 1970, the Trade & Merchandise Marks Act, 1958 and the Copyright Act, 1957. There is no separate law for the protection of integrated circuits. India does not regard 'trade secrets' as an Intellectual Property Rights, but confidentiality and secrecy obligations can be enforced in our country through contractual obligations and civil law. For ready reckoning one page summaries on the main areas of controversy on IPR issues with the USA and the salient features of our Patent Law is also enclosed.

2. The Ministry of Industrial Development has desired that these papers are strictly for internal use and are meant for the internal information and understanding of our scientists and other concerned officials participating in discussions on IPR issues. They have confirmed that the same can be given to the official members of the Standing Working Group and also a few other scientists specifically connected with S&T co-operation.

3. Since the note is written very well in lucid form, MOS may like to retain a copy for his information. We are sending copies to the SWG members also. Our Embassies have more detailed information on the subject. These notes will also be sent to our Science Counsellors.

Vasant Gowariker, 1/8/55
(Vasant Gowariker)
Secretary, DST

MOS (S&T)

TBC Adv (R) along with papers.

Secretary

File No. 3425

317/84

Secret

Department of Science and Technology

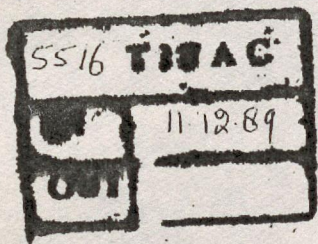
Subject: IPR related matters

I met Shri A V Ganesan, Special Secretary & Chief Negotiator for the Uruguay Round, Ministry of Commerce on 5.12.1989. I had briefly mentioned about the discussions to Secretary. The important points are as under:

I have kept Shri Ganesan apprised of the matters concerning STI and Indo-US Sub-Commission, especially, the recent correspondence between US Ambassador and Secretary, DST. He asked me whether US side have given response to the material given to them after our discussions on STI (IPR) matters during March, 1989. I told him that there was no response from them in terms of 'come back' on our draft and we have left it at that. He felt that our stand should be that they should give a come back on our draft and also that anything in future on IPR related matters can be addressed in the country in totality only after the outcome of GATT negotiation.

I also discussed with him about the Standing Working Group on Intellectual Property Rights Issues concerning International S&T Co-operation. He has kindly agreed to be present when I convene the meeting. He would give a brief to the members about the status of the matter and also discuss some issues concerning patents and also what could be incorporated in the S&T agreements. I will soon call a meeting depending on his convenience.

We also briefly discussed about the National Working Group on Patent Laws. Many of our scientists (even the top ones) do not understand the full import of IPR Issues and look at issues from the view point of science and not as technology, industry and commerce. Hence critical analysis considering real life world does not emerge from their talks. He felt that it may be better that DST organised a small group of Scientists/technologies ranging from 25 to 50 drawn from various government laboratories and he had agreed to give a good briefing to them. We should have this meeting when Secretary, DST is also present since this is a part of educational exercise to our scientists and also to get the feed back to them. The main theme would be to ensure that these issues have to be approached not emotionally but analytically. We will try to arrange one such meeting also soon.



U.O. No DST/1357/PS/89
dt. 9-12-89

[Signature]
S. Rajan
Adviser
09.12.1989

~~Secretary~~ May please see in kind information
Cabinet Secretary
[Signature]
5/11/89

✓
Bor. Adviser Rajan

SECRET

Department of Science and Technology

As MOS(S&T) is aware, a Standing Working Group (SWG) for S&T Departments on IPR was constituted in DST, with his approval, on 18th December, 1988 to consider all IPR issues relating to International S&T Cooperation [F/A]. When orders were issued, there already existed a Working Group, which included officials from DSIR, DST etc, constituted by the Ministry of Commerce to consider all issues relating to IPR [F/B].

Subsequently, since issues connected with GATT etc made the IPR quite complex, the Government constituted a Nodal Group on IPR under Secretary (ID)'s Chairmanship for evaluation/guidance on all bilateral discussions etc. The members of the Nodal Group are Secretary (Commerce), Special Secretary (MA), PMO & Secretary (IO), MEA.

With the constitution of this Nodal Group, the Working Group already constituted by the Ministry of Commerce was disbanded [F/C].

SWG of the S&T Deptt could not meet since various issues concerning IPR and preparations for the second Indo-US meeting on IPR were going on. MOS(S&T) is aware of the complexities of the matter. In the meanwhile, there was a Government instruction asking all the Departments to be cautious in dealing with IPR matters since the Nodal Group is considering the overall issues. Subsequently, it is this Nodal Group which considered our approach for the second Indo-US meeting; Secretary, DST was an invitee for the Nodal Group meeting. In view of these developments and partly because of the fact that our Indian team was very busy with the inter-ministerial coordination for their second round meeting in Washington with US counterparts, no meeting of the SWG on S&T was arranged.

Scientific Departments have not brought up any proposal/issue for SWG's consideration. Moreover, since day-by-day the IPR is getting quite complex and complicated, and since the SWG consist of non-official members, certain issues, for obvious reasons, could not be discussed (not even formal briefing) in their presence. At the same

SECRET

SECRET

-: 2 -:

time, to convene a meeting without these non-official members look somewhat odd.

... [F/D]

MOS(S&T) may also like to see the inputs sent by MEA (based on inputs from Deptt of Industrial Development) on the question of patents, the working procedures in India. Perhaps these inputs could be sent to the members of SWG who come from the S&T Departments. Our Science Counsellor also could use the material to brief our Scientists, since most of the issues raised by US Scientists are because they don't have factual information about our patent laws.

In the circumstance, I suggest that the Standing Working Group (SWG) for S&T Deptts constituted with the MOS's approval to arrive at a consensus of the S&T Deptts on the IPR related issues and with the terms of reference as in the relevant Office Order be allowed to function without the non-official members atleast for some time. I also suggest that Shri Y S Rajan, Adviser be the Chairman of the Group. MOS(S&T) may kindly approve. If any clarification is called for, I am available.

113 TIRAG
IN 11R-689
DU

MOS, S&T
5-191/MOS/89
8/6/89

Vasant Goward
(Vasant Gowardiker)
Secretary
7.6.1989

MOS(S&T)

Agreement.
Can general view on IPR be
should still consult them with
people who are no knowledgeable
Narayana Rao
10/6/89

Encl: As above

2914
12-6-89

Secy (S&T)

Sh. Rajan

SECRET

December 18, 1988.

Office Memorandum

Sub: Standing Working Group on Intellectual Property Rights Issues concerning International S&T Cooperation.

At a meeting presided over by MOS (S&T), it was decided to set up a Standing Working Group for the S&T Departments/ agencies (viz DAE, DOS, DSIR/CSIR, DBT, DOD, DOE & DST), to consider all Intellectual Property Rights (IPR) relating to International S&T Cooperation. The standing Working Group will consist of:

Shri YS Rajan, Adviser, DST
Dr KV Swaminathan, Adviser, DSIR
Dr V Siddhartha, OSD, DRDO
Dr HR Bhojwani, Joint Adviser, CSIR
Shri Gautam Soni, Director, DOE
Dr Nityanand, ex-Director, CDRI
Shri Vedaraman, ex-Controller General of Patents
Nominee of Secretary ID
Nominee of Secretary Commerce
Nominee of Secretary Legal Affairs
Dr U Trivedi, Director DST

Convenor

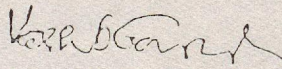
2 Since international agreements/arrangements often involve an element of IPR related issues, the S&T departments/agencies may henceforth present draft agreements/arrangements and related material to the Standing Working Group for assessment before these documents are processed for the conclusion of agreements.

3 The Standing Working Group would analyse the implications and opportunities vis-a-vis Indian interests on international S&T cooperation and Indian laws/regulations pertaining to IPR. They would make presentations of their analysis to the concerned S&T Secretaries prior to deliberations by the Committee of Secretaries.

4 The Convenor of the Group may invite specialists and commission specific studies as necessary.

5 DST will be the Secretariat for the Group.

6 This issues with the approval of MOS (S&T).


(Vasant Gowariker)
Secretary

To:

- 1 All Identified in Standing Working Group
- 2 Secretaries of DAE, DOS, DSIR & DG CSIR, DBT, DOD, DOE

CC: Cabinet Secretary

MEMBERS OF THE STANDING WORKING GROUP ON IPR CONCERNING INTERNATIONAL
S&T COOPERATION

- 1 Y.S. Rajan,
Adviser
Department of Science & Technology
- 2 Dr. K.V. Swaminathan
Adviser
DSIR
- 3 Dr. V. Siddhartha
OSD
DRDO
- 4 Dr. H.R. Bhojwani
Joint Adviser,
CSIR
- 5 Shri Gautam Soni,
Director
Department of Electronics
- 6 Shri N.K. Sabharwal
Joint Secretary
Department of Industrial Development
- 7 Shri A. Hoda
Joint Secretary
Ministry of Commerce
- 8 Shri Sarvesh Chandra^{CS}
Joint Secretary
Department of Legal Affairs
- 9 Dr. U. Trivedi
Director
Department of Science & Technology

NON-OFFICIAL MEMBERS

- 10 Dr. Nityanand, ex-Director, CDRI
- 11 Shri Vedaraman, ex-Controller General of Patents



Y.S. RAJAN
ADVISER
(Tele:No.666073)

भारत सरकार
विज्ञान और प्रौद्योगिकी मंत्रालय
विज्ञान और प्रौद्योगिकी विभाग
टेक्नोलॉजी भवन, नया महरौली मार्ग, नई दिल्ली-११००१६

GOVERNMENT OF INDIA
MINISTRY OF SCIENCE & TECHNOLOGY
Department of Science & Technology
Technology Bhavan, New Mehrauli Road, New Delhi-110016

CONFIDENTIAL

DO No..DST/41/89.....

Date: August-2, 1989

Subject: Standing Working Group on Intellectual Property Rights
Issues concerning International S&T co-operation

Dear Prof. Rao /Dr.Ramachandran/Prof.Gaur/Dr.Srinivasan,

Kindly refer to Office Memorandum No. DST/STI/IPR.Grp./88 dated December 18, 1988 constituting a Standing Working Group on the above subject issued by the Secretary, Department of Science and Technology with the approval of Minister of State, S&T.

* 2. I am enclosing a note prepared by the Department of Industrial Development, which gives position of IPR related issues which will enable scientists and officials participating in discussions on IPR issues with foreign delegations to be familiar with our stand. The note covers patents, trademarks, copyright, protection of integrated circuit and protection of trade secrets. This has been written in simple language for general information and education and, therefore, it does not use legalistic expressions. For precise wording and interpretation of law, reference should be made to the respective laws, namely, the Patents Act, 1970, the Trade & Merchandise Marks Act, 1958 and the Copyright Act, 1957. There is no separate law for the protection of integrated circuits. India does not regard 'trade secrets' as an Intellectual Property Right, but confidentiality and secrecy obligations can be enforced in our country through contractual obligations and civil law. For ready reckoning, one page summaries on the main areas of controversy on IPR issues with the USA and the salient features of our patent law is enclosed.

3. These papers are strictly for internal use and are meant for internal information and understanding of our scientists and concerned officials who have to participate or deal with IPR related issues and, therefore, may be treated very carefully.

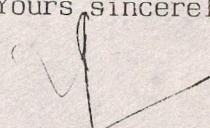
.....contd.

: 2 :

4. Please acknowledge receipt of this letter and copy of the note enclosed.

With regards,

Yours Sincerely,


(Y.S. Rajan)

Prof. U.R.Rao,
Secretary,
Department of Space,
Lok Nayak Bhavan,
Khan Market,
NEW DELHI -110003.

Dr. S.Ramachandran,
Secretary,
Department of Bio-Technology,
CGO Complex,
Lodi Road,
NEW DELHI.

Dr. M.R. Srinivasan, Secretary,
Department of Atomic Energy,
Room No. 145, South Block,
NEW DELHI.

Prof. V.K.Gaur,
Secretary,
Department of Ocean Development,
CGO Complex,
Lodi Road,
NEW DELHI.



Y.S. RAJAN
ADVISER
(Tele:NO: 666073)

भारत सरकार
विज्ञान और प्रौद्योगिकी मंत्रालय
विज्ञान और प्रौद्योगिकी विभाग
टेक्नोलॉजी भवन, नया महरौली मार्ग, नई दिल्ली-११००१६

GOVERNMENT OF INDIA
MINISTRY OF SCIENCE & TECHNOLOGY
Department of Science & Technology
Technology Bhavan, New Mehrauli Road, New Delhi-110016

CONFIDENTIAL

DO No.....DST/41/89.....

Date...July...28...1989

Sub: Standing Working Group on Intellectual Property Rights Issues
concerning International S&T Co-operation.

Dear

Kindly refer to Office Memorandum No.DST/STI/IPR Grp/88 dated December 18, 1988 constituting a Standing Working Group on the above subject issued by the Secretary, Department of Science and Technology with the approval of Minister of State, S&T. It has now been decided that I should chair the Working Group.

2. Upto now no specific proposal/issue has been brought for consideration of the Group by the Scientific Departments. Situation regarding IPR vis-a-vis USA was getting complex and it was dealt with at higher levels of Government.

3. Secretary, DST proposes to call the first meeting of the Working Group to exchange views and also to brief about some important matters. Meanwhile a note which gives position of IPR related issues which will enable scientists and officials participating in discussions on IPR issues with foreign delegations to be familiar with our stand, is enclosed. The note covers patents, trademarks, copyright, protection of integrated circuit and protection of trade secrets. This has been written in simple language for general information and education and, therefore, it does not use legalistic expressions. For precise wording and interpretation of law reference should be made to the respective laws, namely, the Patents Act, 1970, the Trade & Merchandise Marks Act, 1958 and the Copyright Act, 1957. There is no separate law for the protection of integrated circuits. India does not regard 'trade secrets' as an Intellectual Property Right, but confidentiality and secrecy obligations can be enforced in our country through contractual obligations and civil law. For ready reckoning, one page summaries on the main areas of controversy on IPR issues with the USA and the salient features of our patent law is enclosed.

4. These papers are strictly for internal use only and are meant for internal information and understanding of our scientists and concerned officials who have to participate or deal with IPR

...contd.

related issues, and, therefore, may be treated very carefully.

5. I would also appreciate it, in view of this importance, if you keep Secretary of your Department informed.

6. Please acknowledge receipt of this letter and the copy of the note enclosed.

With regards,

Yours sincerely,

(Y.S. Rajan)

O/C

To: All Members of Standing Working Group on IPR except Dr. Nityanand and Shri Vedaraman.

- (i) Dr. H. R. Bhojwani
Joint Adviser
CSIR, Rafi Marg
New Delhi
- (ii) Shri Gautam Soni
Director
Department of Electronics
Lok Nayak Bhavan
New Delhi
- (iii) Shri A Hoda
Joint Secretary
Ministry of Commerce
Udyog Bhavan, New Delhi - 110011
- (iv) Shri Suresh Chander
Joint Secy & Legal Adviser
Department of Legal Affairs
Shastri Bhavan, New Delhi
- (v) Dr. U. Tivedi
Director
Department of S & T.
N. Delhi
- (vi) Dr. K. V. Swaminathan
Adviser, DSIR
Technology Bhavan
New Delhi
- (vii) Dr. V. Siddhanta
Officer on special duty
Secretary of Space Scientific
Adviser to Raksha Mantri
Mini. of Defence
R.No. 134, 'B' Wing
Sena Bhavan, N. Delhi

No. 14/60/88-TPD
Government of India
Ministry of Commerce

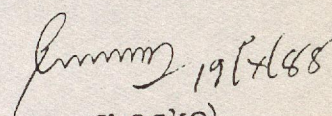
New Delhi, the 19th Oct. 1988

OFFICE MEMORANDUM

Subject: Meeting of the Working Group to consider
issues relating to intellectual property rights.

The undersigned is directed to refer to d.o. letter of even no. dated 30th August, 1988 from Sh.A.Hoda, Joint Secretary regarding the establishment of a Working Group to consider all the issues relating to intellectual property rights. The first meeting of the Working Group will be held at 11.15 A.M. on Monday, 24th October, 1988 under the chairmanship of Commerce Secretary in room No. 141, 1st floor, Udyog Bhavan. The purpose of the first meeting would be to take stock of the issues related to intellectual property rights which are under consideration in various Ministries/Departments. As far as this Ministry is concerned the issue had come up in the Uruguay Round of Multilateral Trade Negotiations presently in progress. A background note on the same is enclosed.

You are requested to kindly make it convenient to attend the meeting.


(K.T. Chacko)
Director

To

1. Shri Y.S. Rajan, Adviser, Ministry of Science & Technology.
2. Dr.K.V. Swaminathan, Adviser, Ministry of Science & Technology
3. Dr.V. Sidhartha, OSD, DRDO, Min. of Science & Technology
4. Shri A.V. Ganesan, Additional Secretary, Deptt. of Industrial Development

to message.

meeting
A first formal

1/10/88

No. 14/60/88-TPD
Government of India
(Trade Policy Division)

New Delhi, the 2nd February, 1989.

OFFICE MEMORANDUM

Subject: Working Group to consider issues
relating to Intellectual Property Rights.

The undersigned is directed to refer to the correspondence resting with this Ministry's O.M. of even number dt. 19th October, 1988, and to say that in consultation with Prime Minister's Office, it has been decided to discontinue the Working Group on Intellectual Property Rights under this Ministry.

Mandhawa
(P. S. RANDHAWA)
DEPUTY SECRETARY TO THE GOVT. OF INDIA

TO

1. ✓ Shri Y. S. Rajan, Adviser, Ministry of Science & Technology.
2. Dr. K.V. Swaminathan, Adviser, Ministry of Science & Technology.
3. Dr. V. Sidhartha, OSD, DRDO, Min. of Science & Technology.
4. Shri A.V. Ganesan, Addl. Secretary, Department of Industrial Development.
5. Shri Shyam Suri, Joint Secretary, Department of Chemicals & Petro-chemicals.
6. Shri V.K. Agarwal, Joint Secretary & Legal Adviser, Deptt. of Legal Affairs.
7. Shri Gautam Soni, Technical Director, Department of Electronics.
8. Shri K.J. Mathew, Dy. Secretary, Ministry of Information & Broadcasting, Shastri Bhavan, N. Delhi
9. Ms. Mina Ahuja, Deputy Secretary & Registrar of Copyrights, Department of Education.
10. Dr. S. Rama Rao, Legal Officer, Ministry of External Affairs (I&T Division).

DST may pl

su

Raj

6/2

UT

Dhan

es /uz/ween?

6/2

2

209

D.O.No. 12/18/88-PP&C

SMT. JAYASHREE WATAL
DEPUTY SECRETARY
TELE: 301 3196

Government of India
Ministry of Industry
(Deptt. of Industrial Development)
Udyog Bhavan, New Delhi.

3401	TIFAC
IN	11.6.89
OUT	11.6.89

May 29, 1989.

Dear Deepak,

As discussed in the meeting held in Shri A.V. Ganesan's room on 17.5.1989, I am herewith sending the following material on Intellectual Property Rights which is to be passed on to the US side in connection with the discussions on the Science and Technology Initiative (STI) -

- (1) Protection of Patents in India.
- (2) The law and procedures relating to non-voluntary licences under the Indian Patents Act, 1970.
- (3) The Sixteenth Annual Report on the Controller General of Patents, Designs and Trade Marks.

Yours sincerely,

Sd/-

(Jayashree Watal)

Encl: As above.

Shri Deepak Bhojwani,
Deputy Secretary,
Ministry of External Affairs,
South Block,
New Delhi.

Copy to: Shri Y.S. Rajan, Adviser, DST & Executive Director
Department of Science & Technology, New Delhi.
with all enclosures as above for information.

Copy to: Dr J. Dhar
for your information

J. Watal
20/5/89
(Jayashree Watal)

Patent Law and Biotechnology: An Introduction*

Disclosures about research or failure to deposit proper materials can jeopardize any microbiologist's patent rights, particularly outside the United States

RONALD A. DAIGNAULT, KENNETH LOERTSCHER, PAUL J. KOIVUNEIEMI, MYRON MYCHAJLONKA, AND RICHARD SNEAD

The United States patent system provides for two so-called statutory bars to obtaining a patent. A patent will be denied if the invention was patented or described in a printed publication anywhere in the world, or if the invention was publicly used or on sale in the United States more than 1 year before a U.S. patent application was filed.

Since the crucial date in the United States is the date the invention was made, these statutory bars create a grace period of 1 year for the inventor to file an application for a patent. However, most of the countries of the world follow the first-to-file system, which nullifies abroad any possible benefit of the grace period.

The above two limitations are very important to scientists. They must be very careful when they disclose their invention to others, offer it for sale or, especially, publish descriptions of it. Scientists are keen on publishing their results. In the United States,

if such a publication is made prior to filing a patent application, the clock begins to run and a patent must be filed within 1 year. A foreign patent application will be rejected if a description has already been published.

A case in point is *Massachusetts Institute of Technology v. AB Fortia*, 227 USPQ 428 (1985). This case involved two patents issued to the Massachusetts Institute of Technology (MIT), claiming "limited-charge cell microcarriers." The patents covered methods to optimize mammalian cell growth on microcarrier beads with a defined charge capacity range. It came to light that Pharmacia was importing Cytodex microcarrier beads having charge capacities within the range claimed in the MIT patents. MIT filed a complaint with the International Trade Commission (ITC) against Pharmacia. The complaint charged patent infringement and unauthorized manufacture abroad.

The ITC found the MIT patents invalid because they were obvious in view of what was known at the time the applications were filed. In determining obviousness, the ITC noted that the use of DEAE-Sephadex A-50 beads (a Pharmacia product) as cell culture microcarriers was established long before the MIT patents were filed. Also, at the time the invention was made, it was common knowledge in the field of cell biology that high concentrations of A-50 beads resulted in a "toxicity phenomenon" on cell growth, and that this could be overcome by treatment with serum or a polyanion, such as nitrocellulose, which lowers the charge capacity of the beads.

This knowledge was found to be "common" because, over 1 year before the patent application was filed, the would-be inventor gave a talk in Birmingham, Ala., describing research related to the patent application and made available copies of a research paper pertain-

Ronald A. Daignault is pharmaceutical patent counsel at the Corporate Legal Department, Warner Lambert Co., Ann Arbor, Mich. Kenneth Loertscher is senior attorney I at the the Legal Department, Dow Chemical Co.—Europe Division, Horgen, Switzerland. Paul J. Koivuneimi is patent attorney at the Corporate Patents and Trademarks Department, Upjohn Co., Kalamazoo, Mich. Myron Mychajlonka is assistant professor of microbiology at the Department of Natural Sciences, University of Michigan, Dearborn. Richard Snead is patent analyst at the Intellectual Property Law Department, Cetus Corp., Emeryville, Calif.

*This article grew out of a roundtable discussion at a regular meeting of the Michigan Branch of ASM in May 1987.



Y.S. RAJAN
ADVISER

(Tele: No: 666073)

भारत सरकार
विज्ञान और प्रौद्योगिकी मंत्रालय
विज्ञान और प्रौद्योगिकी विभाग
टेक्नोलॉजी भवन, नया महरौली मार्ग, नई दिल्ली-११००१६

GOVERNMENT OF INDIA
MINISTRY OF SCIENCE & TECHNOLOGY
Department of Science & Technology
Technology Bhavan, New Mehrauli Road, New Delhi-110016

CONFIDENTIAL

DO No..DST/19/89/Adv(R)

Date.15..2..90.....

Subject: Standing Working Group on Intellectual Property Rights Issues concerning International S&T Co-operation.

To: All Members of Standing Working Group on IPR

Dear Sir,

Kindly find enclosed a copy of an article 'Patent Law and Biotechnology: An Introduction', which discusses some of the issues, for your information and use.

With regards,

Yours sincerely,

(Y.S. Rajan)

128421
16/2/90

Patent Law and Biotechnology: An Introduction*

Disclosures about research or failure to deposit proper materials can jeopardize any microbiologist's patent rights, particularly outside the United States

RONALD A. DAIGNAULT, KENNETH LOERTSCHER, PAUL J. KOIVUNEIEMI, MYRON MYCHAJLONKA, AND RICHARD SNEAD

The United States patent system provides for two so-called statutory bars to obtaining a patent. A patent will be denied if the invention was patented or described in a printed publication anywhere in the world, or if the invention was publicly used or on sale in the United States more than 1 year before a U.S. patent application was filed.

Since the crucial date in the United States is the date the invention was made, these statutory bars create a grace period of 1 year for the inventor to file an application for a patent. However, most of the countries of the world follow the first-to-file system, which nullifies abroad any possible benefit of the grace period.

The above two limitations are very important to scientists. They must be very careful when they disclose their invention to others, offer it for sale or, especially, publish descriptions of it. Scientists are keen on publishing their results. In the United States,

if such a publication is made prior to filing a patent application, the clock begins to run and a patent must be filed within 1 year. A foreign patent application will be rejected if a description has already been published.

A case in point is *Massachusetts Institute of Technology v. AB Fortia*, 227 USPQ 428 (1985). This case involved two patents issued to the Massachusetts Institute of Technology (MIT), claiming "limited-charge cell microcarriers." The patents covered methods to optimize mammalian cell growth on microcarrier beads with a defined charge capacity range. It came to light that Pharmacia was importing Cytodex microcarrier beads having charge capacities within the range claimed in the MIT patents. MIT filed a complaint with the International Trade Commission (ITC) against Pharmacia. The complaint charged patent infringement and unauthorized manufacture abroad.

The ITC found the MIT patents invalid because they were obvious in view of what was known at the time the applications were filed. In determining obviousness, the ITC noted that the use of DEAE-Sephadex A-50 beads (a Pharmacia product) as cell culture microcarriers was established long before the MIT patents were filed. Also, at the time the invention was made, it was common knowledge in the field of cell biology that high concentrations of A-50 beads resulted in a "toxicity phenomenon" on cell growth, and that this could be overcome by treatment with serum or a polyanion, such as nitrocellulose, which lowers the charge capacity of the beads.

This knowledge was found to be "common" because, over 1 year before the patent application was filed, the would-be inventor gave a talk in Birmingham, Ala., describing research related to the patent application and made available copies of a research paper pertain-

Ronald A. Daignault is pharmaceutical patent counsel at the Corporate Legal Department, Warner Lambert Co., Ann Arbor, Mich. Kenneth Loertscher is senior attorney I at the the Legal Department, Dow Chemical Co.—Europe Division, Horgen, Switzerland. Paul J. Koivuneimi is patent attorney at the Corporate Patents and Trademarks Department, Upjohn Co., Kalamazoo, Mich. Myron Mychajlonka is assistant professor of microbiology at the Department of Natural Sciences, University of Michigan, Dearborn. Richard Snead is patent analyst at the Intellectual Property Law Department, Cetus Corp., Emeryville, Calif.

*This article grew out of a roundtable discussion at a regular meeting of the Michigan Branch of ASM in May 1987.

ing to the presentation. The inventor's paper expressly stated that reducing the total charge capacity of the A-50 beads would have the same effect as pretreatment.

Subsequently, MIT appealed the case to the U.S. Court of Appeals for the Federal Circuit (CAFC). This is a special appellate court that hears all appeals of patent cases from U.S. district courts as well as the U.S. Patent and Trademark Office—an expansion of the old Court of Customs and Patents Appeals. MIT argued that distribution of the paper in Birmingham by the inventor could not be used to show obviousness because it was not a "printed publication" as defined in the patent statute. The CAFC disagreed and affirmed the ITC conclusion because between 50 and 500 individuals interested and familiar with the subject matter were told of the paper and its contents. In addition, the paper was disseminated without restriction to at least six persons.

It is clear from this case that scientists can readily jeopardize their own patent rights. Even if the paper had not been accepted by others attending the meeting, the court would still have invalidated the patent. The mere act of making the document available to the public makes it a printed publication under the law. The court decided in *In re Bayer*, 196 USPQ 640 (CCPA 1978), that, if individuals trained in the field to which the document pertains could have a copy "merely by asking," the document is deemed to be publicly available and thus disclosed.

U.S. and Foreign Patents

A U.S. patent is not the only protective mechanism for inventions. Foreign patents are also extremely important (see p. 616). This is particularly true for the pharmaceutical industry, the industry primarily concerned with microbiological and biotechnological inventions. Approximately 50% of sales of any U.S. company's drug are in foreign markets, primarily Europe and Japan. A major consideration in deciding to develop a new chemical entity into a product involves reviewing the foreign patent position for that product. If the foreign patent position is poor, a product is less likely to be developed. Therefore, foreign patents are an extremely valuable property right. Unfortunately, these very valuable property rights are lost every day—often because of ignorance.

All foreign patent systems are essentially the same as the U.S. patent system in terms of patentability requirements and substantive rights granted under the patent. All foreign patents essentially confer upon the patentee the right to exclude others from making, using, or selling the patented invention in the country granting the patent, but only for a limited time. In the United States, this term is 17 years from the date of issuance; for most foreign countries, the term is 20 years from the date of filing of the patent application.

There are, however, important basic differences between the U.S. patent system and those of most foreign countries. Generally speaking, the patent sys-

Patenting: The Standard Is Novelty

Although the patent system in the United States dates back to the drafting of the Constitution, the patent system throughout the world is even older and goes back to the days of the city-states in Italy, e.g., Venice. In England, patents were granted to merchants and manufacturers of various products. The criterion of novelty dates to the Statute of Monopolies, enacted in 1525, which allowed for issue of such grants only when the subject matter was novel. Its purpose was to prevent abuses, such as the granting of patents by the king or queen to favorites. Novelty thus became the first requirement for a patent, and this standard is still applicable today. The other two criteria for patentability are utility (the patentable subject matter must be useful) and unobviousness (the invention must not have occurred to other practitioners of the art).

Novelty simply means something that was not known prior to the time the invention was made. U.S. statutes more precisely define "new" in the negative as not novel if, at the time the invention was made, it was:

- known or used by someone else in the United States
- described in a printed publication anywhere in the world
- described in another party's patent application which was filed before the invention was made and later issued as a patent.

tems of the world can be divided into two groups. The "first-to-invent" countries include the United States, Canada, and the Philippines. In these countries, the actual first inventor has the right to a patent regardless of who filed a patent application claiming the invention first. Priority is determined in a quasi-judicial proceeding called an interference.

In the rest of the world, including Japan and Europe, the first to file a patent application for an invention gets the patent, no matter who invented it first. No surprisingly, these countries are referred to as "first-to-file" countries.

There are some other important differences between the patent systems of most foreign countries and the United States. An applicant for a U.S. patent must disclose what he or she regards as the "best mode" for making and using the invention. Concealment of the best mode is grounds for invalidating a patent. Most foreign countries do not require disclosure of the best mode.

An applicant for a patent in the United States is under a duty of candor which requires disclosure, to the U.S. Patent and Trademark Office, of all information—for example, prior publications—that may have a bearing on the case. Such full and frank disclosure is not required in most foreign countries.

U.S. patent applications must be filed by the actual inventor, i.e., the person who actually did the work. In most foreign countries, the application may be filed in the name of the actual party of interest, for example, a company or a university using the invention.

Publication and Foreign Patents

U.S. inventors are losing their foreign patent rights every day. This is particularly true of people in university settings. The primary reason appears to be unfamiliarity with the detrimental effect of early disclosure, primarily through early publications, on foreign patent rights.

Under EPC regulations, virtually any disclosure, even informal discussions, may bar patentability.

There are two basic rules to remember with regard to publications and patents. First, with regard to U.S. patents, the invention must be made before anyone else publishes it, and the application must be filed within 1 year of anyone's, including the inventor's, publication of the invention. Second, with regard to foreign patents, the patent application must be filed before anyone, including the inventor, discloses the invention anywhere and in any way. For example, in Europe, under the European Patent Convention (EPC), publication of a document after the filing date may preclude a patent if, for example, the document summarizes a talk disclosing the invention that was given publicly prior to the application date. Under EPC regulations, virtually any public disclosure, including even informal discussions, may bar patentability. This can be a real problem for most scientists, who are under pressure to publish early.

How is it possible to reconcile the necessity to publish with the requirements of the patent laws? Clearly, scientists must balance the desire to share new ideas and research results with the possible remunerative benefit provided by patent protection. Ideas can be extremely valuable, and although some scientists have contributed potentially patentable work to the public domain (e.g., the method of sequencing invented by Maxam and Gilbert and the method of producing monoclonal antibodies invented by Köhler and Milstein), others have protected the prospects of financial reward by obtaining patents (e.g., "Process for Producing Biologically Functional Molecular Chimeras," Cohen and Boyer, U.S. Patent 4,237,224, and "Recombinant Cloning Vehicle, Microbial Polypeptide Expression," Itakura and Riggs, U.S. Patent 4,704,362). As the value of patent protection in the biological sciences becomes increasingly apparent, scientists and their institutions will be faced with more frequent decisions concerning public disclosure of scientific discoveries.

Unfortunately, there is no universally acceptable solution to these challenges. In 1765 Abbe Lazzaro Spallanzani found, in a series of experiments concerned with the question of spontaneous generation,

that beef broth which had been boiled for 1 hour in a sealed flask did not spoil. Yet, despite 4 decades of "prior art," Francois Nicolas Appert was issued a patent in 1810 for processing meats in glass bottles that had been kept in boiling water for various intervals. Today, even stamping a research paper "confidential" might not protect the inventor's rights. Although a confidential exchange of information is not a printed publication, such exchanges must be accompanied by a signed agreement from each party with access to the information. Such an agreement should state that all information obtained from the inventor will be maintained in strictest confidence and not used in any way (i.e., as a means of furthering one's research). Agreements of this type would be too restrictive and impractical to allow exchange of information at large scientific meetings.

Even if an inventor merely shows slides, this presentation can be considered printed information that can remove patent protection. However, the law is less clear in these cases. In *Regents of the University of California v. Howmedica*, 210 USPQ 727 (1981), a case involving a patent on an artificial knee joint, the court found that projection of slides to a group of 30 individuals was limited in duration and thus did not enable a skilled person to make or use the invention. Consequently, the slide presentation was not considered a "printed publication," and the patent was upheld. One might infer that the complexity of the invention, the contents of the slides, the duration that the slides are projected, and whether the audience is permitted to photograph the slides will all contribute to determining whether the slides qualify as a printed publication. Conceivably, however, in the MIT cell growth case, the information on the slides might have been considered enough to render the patent obvious and invalid.

The only way to avoid these patent problems is to defer for a short period any "restricted disclosure" of an invention. Any restricted disclosure includes informal conversations, departmental seminars, lectures, press releases—in short, any nonconfidential exchange. What is "a short period of time"? Patent lawyers recommend waiting 18 months after the original application covering the subject matter is filed. At that time, a foreign patent application is likely to be published anyway.

As a practical matter, a patent application should be filed before a talk is presented at a meeting or a paper is published. It would be better to file an application before an article or abstract is submitted, but if the manuscript has already been submitted or presented, an application should be filed before the manuscript is published.

Patent Treaties

Because of the significance of foreign patents, the most restrictive requirements of the patent systems of any important countries can govern behavior. Thus, as a practical matter, the inventor is working in a first-to-file, "absolute novelty" world. Although the United

Depositing Biological Material

What consideration must be made as to whether a deposit of biological material is required? One of the sections of the U.S. patent laws not mentioned earlier, which has an important bearing on the validity of a patent, is 35 U.S.C. 112. The section states:

To obtain a patent:

1. *The patent application must adequately describe the claimed invention.*

2. *The patent application must have sufficient teachings to enable one skilled in the art to practice the claimed invention without undue experimentation.*

3. *The patent application must disclose the best mode of making and using the claimed invention known to the patent applicant at the time of filing the patent application.*

In applying this "enabling" section of the statute to inventions concerning biological materials, several important considerations need be addressed. If the claimed invention relies on the availability of a biological material (such as a microorganism, cell line, plasmid, etc.) to practice the claimed invention, the inventor must consider whether the biological material must be deposited to meet the enabling requirement.

If a deposit is necessary, the inventor must determine what to deposit and where to make the deposit. It is prudent to make the deposit before the patent application is filed and include the name and address of the depository and the deposit number in the patent application. And

finally, the inventor must consider whether it is necessary to deposit additional biological materials to meet the best-mode requirement.

Where a description alone is not sufficient to comply with the three provisions of U.S.C. 112, a sample of the biological material may be necessary to allow those skilled in the art to make and use the invention. The requirements of 35 U.S.C. 112 are satisfied if the appropriate biological material is known and readily available to the public or a deposit is made in accordance with the procedures and conditions set out by the depository itself and/or by the applicable international convention.

For example, for worldwide patent coverage, it is best to use a depository recognized by the Budapest Treaty. These include:

- The American Type Culture Collection in Rockville, Md., which is a depository for algae, pathogenic and nonpathogenic bacteria, protozoa, fungi, bacteriophages, plasmids, oncogenes, cell lines, hybridomas, animal and plant viruses, plant tissue cultures, and seeds
- The Agriculture Research Culture Collection (NRRL) in Peoria, Ill., which handles fungi and bacteria that can be freeze-dried (no human or plant pathogens, however)
- In Vitro International, Inc., in Linthicum, Md., which deposits algae, pathogenic and nonpathogenic bacteria, protozoa, fungi, phages, plasmids, cell lines, hybridomas, and animal and plant viruses.

States is considering a first-to-file system, but would like other countries to allow a 1-year grace period for filing patent applications, such a system is not currently in place.

There are, however, certain treaties that make it easier to obtain foreign patents. The first is the Paris Convention of 1883 for the Protection of Industrial Property. Under the Paris Convention, an inventor has a 1-year grace period (the convention year) to file foreign patent applications after filing his original U.S. application. Therefore, before a talk or publication, it is necessary only to file a U.S. patent application to protect the right to file in the absolute novelty countries. The first application is sometimes called the "priority application."

The Patent Cooperation Treaty (PCT) allows inventors to file one international application designating the countries where they would eventually like to obtain a national patent. For example, the application can be written in English, and the decision to file in other designated countries can be deferred for up to 30 months. To take full advantage of these two treaties, the best strategy is to file a U.S. application and then, within the priority year, file a PCT application. By taking this step, it is necessary to file only two patent applications, both in English, to retain and protect all foreign patent rights with relatively little effort or exposure.

The EPC allows inventors to file a single application but designates up to 12 European countries. A European patent is granted and is effective in the

designated countries. Unlike the EPC, the PCT does not grant an international patent. Under the PCT, the application simply proceeds to substantive examination in the national patent countries—there is no PCT patent as such.

A fourth treaty is the Budapest Treaty on the Deposit of Microorganisms for the Purposes of Patent Procedure (Budapest Treaty). Unlike the United States, other countries require that a microorganism be deposited before the priority application is filed. Therefore, as a practical matter, a U.S. applicant must do so as well. The Budapest Treaty requires signatory countries to recognize a deposit in any International Depository authority that has been approved by the World Intellectual Property Organization (WIPO). There are currently 19 signatory countries, including the United States, Japan, and the EPC. There are several advantages to making such deposits, and even countries that are not signatories to the Budapest Treaty still generally accept a deposit under the Treaty. Some countries only accept deposits outside the country if done under the Budapest Treaty. Viability tests are performed so that the inventor knows if there is a deposit or not. The inventor needs to make only a single deposit. □

Acknowledgment

We thank Kirston Koths, Protein Chemistry Department, CETUS Corp., for his valuable suggestions.



Confidential

सत्यमेव जयते

अपर सचिव

Adml. Secretary

NO. U/tech/716157

भारत सरकार
उद्योग मंत्रालय
(औद्योगिक विकास विभाग)
उद्योग भवन, नई दिल्ली - ११००११

Government of India
Ministry of Industry
(Deptt. of Industrial Development)
Udyog Bhawan, New Delhi-110011

22nd June, 1989

Dear Shri Gowariker,

The Cabinet Secretary had asked us to prepare a position paper on IPR related issues so that our scientists and officials participating in discussions on IPR issues with foreign delegations are familiar with our stand.

2. I am enclosing herewith a copy of the paper I have prepared covering patents, trademarks, copyright, protection of integrated circuit and protection of trade secrets. This paper has been written in simple language for general information and education and, therefore, it does not deliberately use legalistic expressions. For any precise wording or interpretation of the law, reference should be made to the respective laws, namely, the Patents Act, 1970, the Trade & Merchandise Marks Act, 1958 and the Copyright Act, 1957. There is no separate law for the protection of integrated circuits. We do not regard "trade secrets" as an Intellectual Property Right, but confidentiality and secrecy obligations can be enforced in our country through contractual obligations and the civil law.

3. For ready reckoning, I am enclosing one-page summaries on the main areas of controversy on IPR issues with the US and the salient features of our patent law.

4. These papers are strictly for internal use only and are meant for the internal information and understanding of our scientists and other concerned officials participating in discussions on IPR issues.

With regards,

Yours sincerely,

(A.V. Ganesan)

Dr. Vasant Gowariker,
Secretary, DST,
Technology Bhavan,
New Delhi

All check with him especially
in view of the request received
from our Ambassador in USA, Science
Counsellor is also not for making available
to them as they's interests are the actual point
with respect to India's stand. 25/6

688	TIFAC
N	26/6/89
	27/6/89
OUT	27/6/89

Secretary
Distry No. 397
Date 26/6/89
Dr. Vasant Gowariker
25/6

We won't check with him whether we can send it to DST straight away.

ASU(2)

Patents

Introduction

In one form or another, the patent system has been in vogue in India from as far back as 1856. Till the 1970s, the legislation in force was the Indian Patents and Designs Act, 1911. But as this law was enacted in the colonial period, its focus was on the protection of the monopoly rights of the patent owner and thereby reserve the Indian market for the metropolitan powers. Soon after Independence, the question of revising the patent law to suit the developmental and technological needs of the country was examined, first by the Patents Enquiry Committee (1948-50) under Shri Bakshi Tek Chand, a retired judge of the Lahore High Court and subsequently by the Ayyengar Committee appointed in April, 1957 under the Chairmanship of Justice N. Rajagopala Iyengar. A comprehensive Patents Bill was introduced in 1965 and after detailed consideration by a joint committee and extensive debate in the Parliament, the Patents Act, 1970 was adopted in 1970. This Act came into force on 20th April, 1972 and it is the current legislation on the subject. The law has not been amended in any manner since its coming into force.

Philosophy behind Indian Patents Act, 1970

The philosophy behind the Indian Patents Act, 1970 is set out in Section 83 of the Act, namely that -

- (a) patents are granted to encourage inventions and to ensure that the inventions are worked in India on a commercial scale and to the fullest extent that is reasonably practicable without undue delay; and
- (b) patents are granted not merely to enable patentees to enjoy a monopoly for the importation of the patented article into the country.

The Indian Patents Act strikes a reasonable balance between adequate and effective protection of patents on the one hand, and the developmental, technological and public interest needs of the country on the other.

The evolution of the patent system in the world, both in industrialised and developing countries, would clearly show that there is a correlation between the stage of economic and technological development of a country, and the nature and extent of the patent protection granted by it. Even the industrialised countries of the world today had tuned their patent system to meet the specific needs of their industrial

and technological development. Either they did not have a patent law (for example, Switzerland and Netherlands did not have a patent law for nearly 40 years in the late 19th and early 20th century) or patent protection was excluded in certain sectors (eg. pharmaceuticals) or only process patents were granted in those sectors. The Indian Patents Act takes into account the specific needs and conditions of our country; while affording protection for patents, it seeks to ensure that such protection does not affect either the public interest needs in critical sectors or hamper the building up of domestic technological capacities.

Definition of patentable invention

The typical definition of a patentable invention is that -

- (a) the invention is new
- (b) it involves an inventive step; and
- (c) it is capable of industrial application.

The definition in the Indian Patents Act is not significantly different from the conventional definition. Under our law, invention means any "new" and "useful" product or process of manufacture and includes new and useful improvement thereof.

Exclusion from patentability

The patent laws of the world exclude certain inventions from patentability, although they may constitute inventions in terms of the definition of an invention. Such exclusion may cover both "general categories" as well as "specific products and sectors". The general categories excluded from patentability under the Indian law are the following:

- (i) invention which is frivolous or which claims anything obviously contrary to well established natural laws;
- (ii) inventions whose use would be contrary to law or morality or injurious to public health;
- (iii) discoveries, scientific theories and mathematical methods;
- (iv) methods for treatment of the human or animal body by surgery or therapy or diagnostic methods practised on the human or animal body;
- (v) methods of agriculture or horticulture;
- (vi) methods of testing.

No patent shall be granted under our law in respect of an invention relating to atomic energy.

The patent laws of many developing countries

exclude food and pharmaceutical sectors from patentability, and neither product nor process patent can be given in these sectors (eg. Brazil, Thailand). Under our law, no product patent can be given in food, pharmaceutical and chemical sectors, but process patent can be given in them. In other words, only product patent is excluded, and not process patent in these three sectors.

The definition of "medicine or drug" (i.e. the pharmaceutical sector), in our law, includes agrochemicals like insecticides, germicides, fungicides, weedicides and the like, as well as chemical substances which are ordinarily used as intermediates in the preparation or manufacture of any medicines. The definition of medicine or drug also includes all substances intended to be used for or in the maintenance of public health or the prevention or control of any epidemic disease among human beings or animals. Thus, vaccines will not be entitled to any product patent under our law, although the method of process of manufacturing a new and useful vaccine will be eligible for a process patent.

In the chemical sector also, our law permits only process patents and not product patents. The chemical sector includes, apart from chemical substances normally understood, items such as "alloys, optical glass, semi-conductors and inter-metallic compounds".

The definition of "food" under our law means any article of nourishment and includes any substance intended for the use of babies, invalids or convalescents as an article of food or drink.

Although our law does not explicitly excludes it, all living things are not considered to be patentable under the law. Thus, plant or animal varieties or essentially biological process for the production of plants or animals will not be patentable under our law. So also, micro-organisms and substances obtained by micro-biological processes (eg. natural microbes or genetically engineered microbes) are not eligible for patent under our law.

Computer programs are not patentable under our law as well as the laws of almost all countries of the world including industrialised countries. However, protection of computer program is afforded under the copyright law in many industrialised countries as well as under our Copyright Act.

With regard to patentability of inventions, the main criticism against our law - as well as the laws of other developing countries having the same case - is that we are allowing only "process" patents and not "product" patents in food, pharmaceutical and chemical sectors. The industrialised countries are insisting that we should allow product patents in all sectors.

It may, however, be stated that the application of the patent system to newly emerging technologies, such as bio-technology, information and communication technology and the like, is not free from legal doubt and uncertainty even in industrialised countries. For example, the patent law in industrialised countries in the bio-technology area is still in a flux; as of now, the general view is that the inventions may at best be entitled to "process" patents only, and even then only if the claims under the invention are made narrowly and not broadly.

Product vs. Process patents

As stated above, our law allows only "process" patents in three sectors, namely food, pharmaceutical and chemicals sectors. In all other sectors, product patents are permissible under our law.

The basic rationale for granting only process patents is that the same product can be manufactured by new and different processes. Research and development activity will be blocked or hindered if the discovery of newer and more efficient and economical processes is prevented by the operation of the product patent system. It is relevant to note that till the mid-1960s and 1970s, the patent laws of a number of industrialised countries allowed only process patents

in the chemical and pharmaceutical sectors. The present technological strength of some of those countries in these sectors is at least in part attributed to their following the process patent system⁺⁺ for several decades.

In the case of the food and pharmaceutical sectors, there are additional reasons of public interest for the grant of only process patents. These are that essential articles such as medicine or food must be available at reasonable prices to the public, and the monopoly rights granted through the patent system do not either lead to artificial price being maintained in these sectors or to competition from coming into the market. The policy options available to take care of the developmental, technological and public interest needs were either to exclude these critical sectors from patentability or to provide for

⁺⁺ For example, chemical products were not patentable in the Federal Republic of Germany upto 1967, in the Nordic countries upto 1968 and in Switzerland upto 1978. Spain is not expected to grant such protection before 1992. Japan did not give this protection before 1976. Pharmaceutical substances were not patentable in FRG and France upto 1967, in Italy upto 1977. In Spain, they will not be patentable before 1992. It was only in 1988 that law was amended in Canada to provide product patent protection for food and pharmaceutical products. Even now, Finland and Norway provide process patents only in the pharmaceutical sector, although they might be thinking in terms of switching over to product patents in the mid-1990s. Austria and Greece exercise their right to reservation to refrain for a time from granting patents for chemical and food products on their accession to European Patent Convention.

only process patents in these sectors. We have chosen the option of giving process patents. The industrialised countries are strongly pressing for our giving product patent in every sector, including the food, pharmaceutical and chemical sectors. But our industry, particularly the pharmaceutical and the agro-chemicals industry, are of the view that only process patents must be given in these sectors, and if product patents are allowed, that would seriously affect domestic research and development.

Duration of Patents

The normal duration of patent under our law is 14 years from the date of the patent. (It was 16 years in the Patents Act of 1911). However, in the food and pharmaceutical sectors, where as stated above only process patents are given, the duration is 5 years from the date of sealing of the patent or 7 years from the date of the patent, whichever period is shorter. This shorter duration applies only to food and pharmaceutical sectors, but in the chemical sector, the process patents will be valid for 14 years.

The main reason for shorter duration in the food and pharmaceutical sectors is public interest. The Government had to choose between excluding food and pharmaceuticals completely from patentability (i.e. zero protection) and the normal period of protection of

14 years. As a compromise, the duration of patents in these two sectors was fixed at half of the normal duration.

The industrialised countries want us to have a uniform duration of 20 years for all the sectors, which is generally the prevailing standard in industrialised countries now. However, it would appear that they would be agreeable to developing countries having a patent duration of 15 years, provided it is uniformly applicable to all sectors, and provided further product patents are given in all sectors.

Compulsory licensing

Our law provides for grant of a compulsory licence by the Controller General of Patents on application made by any person interested in the working of the patent. Such a compulsory licence can be given only after the Controller General has heard both the parties and is satisfied that "the reasonable requirements of the public with respect to the patented invention have not been satisfied or that the patented invention is not available to the public at a reasonable price". For this purpose, the expression "reasonable requirements of the public" shall broadly include the following:

- (1) the patented invention is not being worked in the country on a commercial scale or is not being so worked to the fullest extent that is

reasonably practicable.

- (ii) the demand for the patented product is not being met to an adequate extent or on reasonable terms from manufacture in India;
- (iii) the demand for the patented product is not being met to a substantial extent by importation from abroad;
- (iv) by reason of the refusal of the patent owner to grant a licence or licences on reasonable terms -
 - (a) the market for the export of any patented product manufactured in the country is not being supplied or developed;
 - (b) the establishment or development of industrial or commercial activities in the country is unfairly prejudiced.
 - (c) the working or efficient working in the country of any other patented invention is being prevented or hindered.
- (v) by reason of the conditions imposed by the owner of the patent for the grant of licence under the patent, the manufacture, use or disposal of materials not protected by the patent or the establishment or development of industrial or commercial activities in the country is prejudiced.

The provision of grant of compulsory licence is not unique to our law. It exists in the laws of the industrialised countries of the world also and it is basically intended to prevent the possible abuse of the monopoly right of by the patent owner. The grounds in our law for grant of a compulsory licence are very similar to those existing in the U.K. Patents Act, 1977. The laws of other industrialised countries also provide for the grant of compulsory licence in "public interest".

The grievance of the US in this regard is not that there should be no provision for grant of compulsory licence in the law, but the grounds on which compulsory licence can be given should be narrowed, and it is only in exceptional circumstances that the grant of compulsory licence should come into play.

It may be added that since our law came into force on 20th April, 1972, only one compulsory licence has been granted in October, 1978. As on 31st March, 1989, only 15 applications, which were pending from the previous years, continue to remain pending. No application for compulsory licence was received by the Controller General of Patents during the last few years.

The main reason for such low utilisation of the provision of compulsory licence is that, firstly, the patent owner can involve the applicant in lengthy litigation and procedures. Secondly, the law requires that the applicant himself has to establish his ability to work the invention to the public advantage and his capacity to undertake the risk in providing capital and working the invention. Thirdly, the application for compulsory licence can be met only after the expiration of three years from the date of sealing of the patent, which means about 5 years after the date of application for a patent. Considering that the total duration of a

patent under our law is 14 years, and it is only 5/7 years in food and pharmaceutical sectors, any person interested in working the patent may prefer the patent term to expire rather than go in for lengthy litigation. Finally, the commercial working of a patent usually requires the underlying secret know-how, and without the cooperation of the patent owner, this may not be easily available.

Licence of right

Our law provides for the grant of automatic "licence of right" in three sectors, namely food, pharmaceutical and chemical sectors. Every patent granted in these three sectors shall be deemed to be endorsed with the words "licence of right" from the date of expiration of three years from the date of sealing of the patent. This means that after three years from the date of sealing of the patent, any person interested in working a patent in these three sectors is free to do so without the concurrence of the patent owner or without the intervention of the Controller General of Patents. He has to only pay a royalty to the patent owner for the use of the patent. It is only if the two parties cannot mutually agree upon the amount of royalty that the Controller General would need to intervene and settle the royalty rate. The law prescribes that the Controller General shall fix the royalty at a rate not exceeding 4% of the net

ex-factory selling price.

The grant of licence of right in the three critical sectors of food, pharmaceutical and chemicals is designed to avoid litigation and the intervention by the Controller General of Patents. This provision is unique to our law. The US is strongly opposed to the provision for grant of compulsory licence of right in any sector.

As in the case of compulsory licence, this provision also has hardly been used in practice in the country. Since coming into force of the Patents Act, 1970, the total number of patents worked in the country by utilisation of the "licence of right" by anybody other than the patent owner has perhaps not exceeded 25. No patent has been so worked in the last 4 or 5 years. The main reason is that in any case the patent term itself in food and pharmaceutical sectors expires in 5/7 years. Furthermore, the law even otherwise provides for only process patents in these three sectors, and any person using a process other than the patented process is free to manufacture the product.

Reversal of burden of proof

It is basic to our legal system that the plaintiff has to establish his case prima facie before the burden

of proof can be shifted to the defendant. Therefore, where the patent owner feels that his process patent has been infringed upon, he must establish prima facie that infringement. The US wants the burden of proof to be reversed in the case of process patents where the process is for manufacture of a particular product. The argument is that it is difficult for the plaintiff to know the process established by the defendant, although he may be manufacturing the same product and infringing upon the plaintiff's patented process. The laws of several industrialised countries place the onus of proof on the defendant to show that he is employing a process different from the plaintiff's patented process in the manufacture of the same product. We oppose to the reversal of burden of proof because it can lead to frivolous complaints and excessive litigation with the sole objective of discovering the trade secrets and process of the patentees. In effect, it would mean the grant of product patent in sectors where the law otherwise has the objective of providing only process patents.

To sum up, there are four main areas of controversy between US and ourselves with regard to our patent law:

(i) Product versus Process patents

This is the most important area of divergence. Our

law allows only process patents in food, pharmaceutical and chemical sectors whereas the US wants product patents to be given in every sector. The pharmaceutical and, to some extent, the chemical (especially the agro-chemicals) industries in US are lobbying for product patents to be given by developing countries in these sectors.

(ii) Duration of the patent

Our law provides for only a patent term of 7 years (from the date of filing of an application) in the food and pharmaceutical sectors whereas in all other sectors (including the chemicals sector), our law allows a patent term of 14 years. The US would like a uniform patent term of at least 14/15 years in all sectors, even if the duration is not extended to 20 years as in industrialised countries now.

(iii) Licence of right

Our law provides for automatic "licence of right" in the food, pharmaceutical and chemical sectors. The US would like this to be scrapped. On the related question of compulsory licence, the US wants the provisions to be interpreted narrowly and compulsory licences being given in only extreme cases of public interest.

(iv) Reversal of burden of proof

Our law requires the plaintiff to establish his case of alleged infringement by the defendant. The US wants that in the case of process patents that lead to the manufacture of a product, the burden of proof should be reversed and the defendant should be required to establish that he is employing a process different from that of the plaintiff.

Our law does not also provide for patentability for living things, including micro-organisms. Product or even process patents may not be available under our law in areas such as bio-technology and genetic

engineering. Even in industrialised countries, the applicability of the patent system in these areas as well as in other areas of newly emerging technologies is in a flux. Although the US wants that product patent should be given in each and every sector, including for living organisms, the question of grant of patents in newly emerging technologies is a matter of controversy and debate.

Trade Marks

So far as trademarks are concerned, the major controversial issue is not with regard to the adequacy of protection given for trademarks under our trademark law, but with regard to the use of foreign trademarks in the domestic market. Protection for trademarks is available in India both under the statutory law (The Trade and Merchandise Marks Act, 1957) and the common law. The law deals only with trademarks and it does not have any definition of foreign trademark nor does it have any provisions relating to the trademarks owned by foreigners. In other words, the principles of national and non-discriminatory treatment as between trademarks owned by Indians and trademarks owned by foreigners are embedded in our law. Our judicial and administrative system also are more than adequate to deal with the question of protection of trademarks.

However, as a matter of public policy, we lay down a standard condition in our approval for foreign collaborations that "foreign trademarks shall not ordinarily be allowed to be used on domestic sales although they can be used on export sales". Furthermore, in pursuance of the guidelines issued under Section 29 of our Foreign Exchange Regulation Act, we do not permit the payment of any royalty for the use of foreign trademarks in the domestic market.

The US wants that the restriction on the use of foreign trademarks in the domestic market by administrative policy should be removed. It also wants the protection of "internationally well-known trademarks", regardless of whether such trademarks are registered or used in India.

Copyright

There is no difference of opinion with regard to the adequacy of our Copyright Act. As a matter of fact, our Copyright Act provides for protection even beyond the requirements of the Berne Convention of which we are a member. Our copyright law provides for protection to creator's life + 50 years. Furthermore, computer software programs is also protected under our law. Offences under the copyright law have also been made cognizable offences by us.

The grievance of the US in the area of copyright is not with respect to the adequacy of protection under our law, but the inadequacy of its enforcement, especially in the area of video piracy.

Integrated Circuits

While the US, Japan, FRG, U.K. and other industrialised countries have specific national legislation for the protection of the lay-out design of integrated circuits, we do not have a national legislation on the subject so far. Even in industrialised countries, the special legislation for the protection of integrated circuits came into being after 1983 only. Developing countries have yet to consider the question of enactment of a special law for this purpose. However, we have been taking part in the international negotiations held under the auspices of WIPO to conclude a Treaty on this subject. Finally, a Treaty on intellectual property in respect of integrated circuits has very recently been concluded in the Diplomatic Conference held in Washington, D.C. from May 8-26, 1989. The Treaty has been adopted with 49 States voting in favour with 2 (USA and Japan) against and 5 abstentions. All the developing countries, including us, voted in favour of this Treaty. WIPO is expected to organise a special meeting on the subject for the developing countries to frame a

Model Law which would provide a useful reference for national legislation on the subject. Perhaps in the 1990s, we may need to consider the enactment of a legislation on the subject taking into account our interests.

Trade Secrets

The US wants trade secrets to be protected as intellectual property rights. We are opposed to trade secrets being considered as intellectual property rights. Our view is that while secrecy and confidentiality in business relationships should be strictly observed and enforced, it should be done through contractual obligations and the provisions of appropriate civil law and not through intellectual property law.

@@ END @@

MAIN AREAS OF CONTROVERSY

I. PATENTS

1. Product vs. Process patents

Our law allows only "process" patents in the food, pharmaceutical and chemical sectors, whereas US wants product patents to be given in every sector.

2. Duration of patents

Our law provides for only a patent term of 7 years in the food and pharmaceutical sectors, whereas in all other sectors our law allows a patent term of 14 years. The US wants a uniform patent term of at least 14 or 15 years in all sectors, even if the duration is not extended to 20 years.

3. Licence of right

Our law provides for automatic licence of right in the food, pharmaceutical and chemicals sectors. The US would like this to be scrapped. On the related question of compulsory licence, the US wants the provision to be interpreted very narrowly and compulsory licence being given in only extreme cases of public interest.

4. Reversal of burden of proof

Our law requires that the plaintiff has to establish his case prima facie before the burden of proof can be shifted to the defendant. The US wants that in the case of process patents that lead to the manufacture of a product, the burden of proof should be reversed and the defendant should be required to establish that he is not employing the plaintiff's process.

II. TRADE MARKS

1. Use of foreign trademarks in domestic market

There is no major controversy with regard to the protection of trademarks. In our administrative policy, we do not allow the use of foreign owned trademarks on domestic sales. We also do not permit payment of any royalty for the

use of foreign trademarks in the domestic market. The US wants that foreign trademarks should be allowed to be used in the domestic market and the standard condition that we impose in foreign collaboration approvals should be scrapped.

2. Service Marks

The US wants that the trademark law should be extended to service marks also. Under our system, service marks are currently being protected under the common law.

III. COPYRIGHT

The grievance of the US in this area is not with respect to the adequacy of protection under our law but the inadequacy of its enforcement, especially in the area of video piracy.

IV. INTEGRATED CIRCUITS

The US would like us to consider a special legislation for the protection of lay-out designs in integrated circuits. We have recently voted in favour of a Treaty on this subject. Perhaps, in 1990s, we will need to consider enactment of a legislation on the subject taking into account our interests.

V. TRADE SECRETS

The US wants trade secrets to be protected as intellectual property rights. Our view is that it should be done through contractual obligations and the appropriate civil law and not through intellectual property law.

SALIENT FEATURES OF OUR PATENT LAW

1. In the food, pharmaceutical and chemicals sectors, only process patents are available and not product patents. In all other sectors, product patents are available.
2. The normal duration of a patent is 14 years, but in the food and pharmaceutical sectors, the patent term is only 7 years.
3. The commercial working of the patent in our country, wherever it is techno-economically feasible to do so, is a major objective of our law.
4. The Controller General of Patents can grant a compulsory licence to any person on an application by him if he is satisfied that the reasonable requirements of the public with respect to the patented invention have not been satisfied or that the patented invention is not available to the public at a reasonable price.
5. In food, pharmaceutical and chemical sectors, every patent shall be deemed to be endorsed with the words "licence of right" after three years from the date of sealing of the patent. This means that any person can commercially work the patent without the concurrence of the patent owner or the intervention of the Controller General of Patents.
6. Under our law, it is for the plaintiff to establish alleged infringement of patent, even in those cases where the patent is a process patent and that process is for the manufacture of a product.
7. Alongwith certain general categories of inventions, the following are not patentable under our law:
 - (1) Atomic energy
 - (2) Living organisms
 - (3) Methods of agriculture and horticulture
8. Computer software is not patentable under our patent law, but is protected under our Copyright Act.

ADDRESSING INTELLECTUAL PROPERTY PROTECTION
IN U.S.-INDIA SCIENCE AND TECHNOLOGY AGREEMENTS

Issue

India's especially weak protection for intellectual property rights has been a source of concern for both the USG and U.S. companies doing business in India. At the November meeting of the U.S.-India Science and Technology Subcommittee, the USG plans to inform the GOI of our intention to begin discussions on the objectives of Executive Order 12591, requiring consideration of foreign governments' protection of U.S. intellectual property rights in concluding science and technology agreements. This paper provides three alternatives for addressing these issues; the choice will depend on Indian reactions.

Discussion

STATUS OF IPR PROTECTION IN INDIA

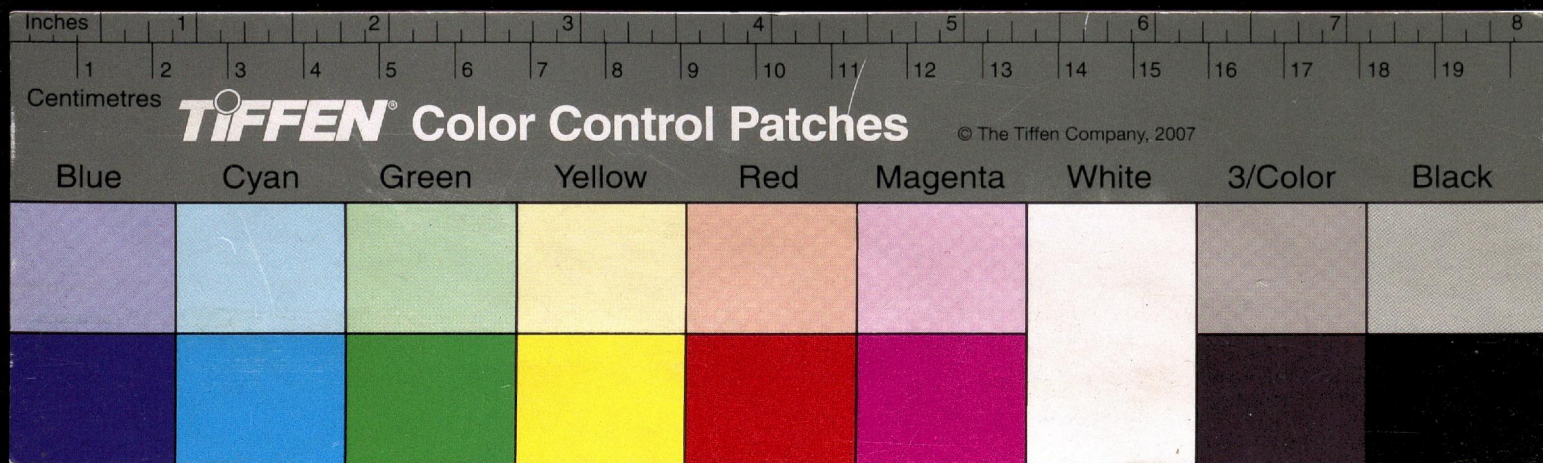
Following is a summary of major problems with Indian IPR protection:

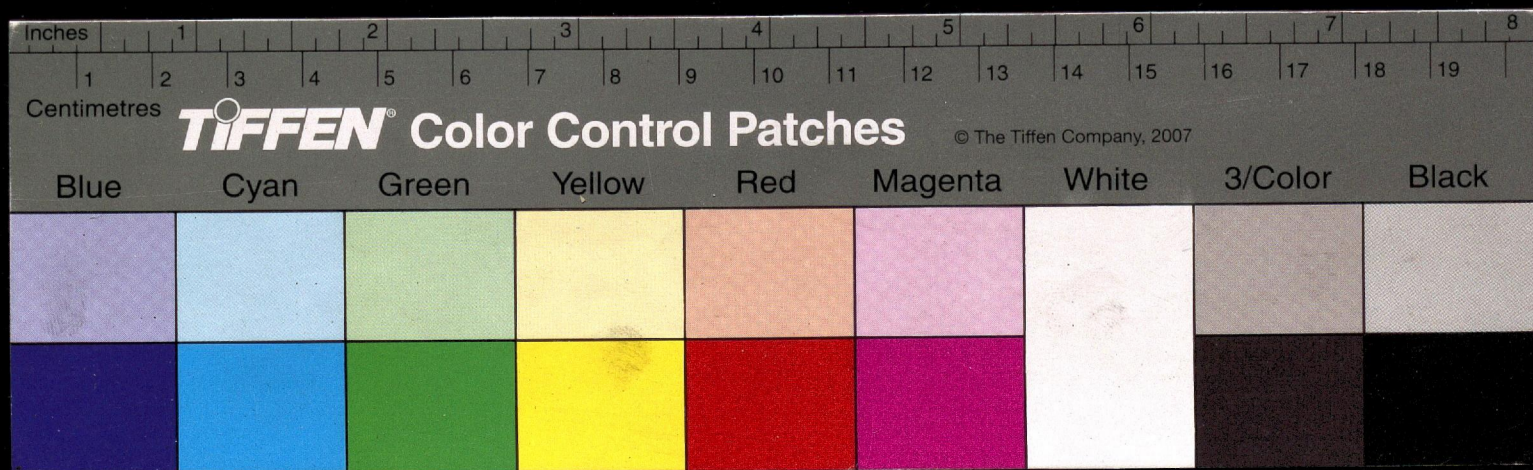
Patents: India's Patent Act denies product patent coverage in the major fields of foodstuffs, chemicals, pharmaceuticals, veterinary products, pesticides, and agrichemical products, well as alloys, optical glass, semiconductors, and compounds. Only process patent protection is provided for pharmaceutical products. U.S. companies have been especially disappointed in the lack of protection for chemicals and pharmaceuticals.

The term of process patents in India is three years from the filing date or five years from the date of grant. (The term for all other patents is three years from the filing date.) The time needed to complete the required clinical or field testing and begin marketing the product often exceeds five to seven years.

The Patent Act gives the GOI broad powers to grant patent licenses to third parties, including compulsory exclusive licenses that deprive the patentee of all rights to use or license his patent. Moreover, after three years from the patent grant, the GOI can issue a compulsory license to anyone alleging "that the reasonable requirements of the public have not been satisfied or that the patented invention is not available to the public at a reasonable price." The patent may be revoked on the same grounds after the expiration of two years from the date of grant of a compulsory license.

Indian policy guidelines normally limit recurring royalty payments, including patent use payments, to 5 percent of the selling price (net of certain taxes and purchases).





Incorporating IPR provisions in S&T agreements should therefore serve at least three purposes: (1) improving protection for products and processes covered by these agreements, (2) promoting support for better IPR protection among both the Indian academic and business scientific communities, and (3) providing specific examples of how improved protection can benefit India, whereas continuation of the current regime could delay access to technology and investment.

RECOMMENDATION

The issue of inadequate IPR protection must be addressed in the context of U.S.-India S&T cooperation. Our initial objective should be to use these discussions to encourage broader improvements in IPR protection, including changes we are seeking outside the S&T context.

If the USG assessment is that GOI reactions are sufficiently positive, option (3) could be a reasonable alternative to pursue. If, on the other hand, it becomes clear that there is little willingness on India's part to discuss broader IPR issues, options (1) or (2) could prove to be the only responses that will meet USG objectives of ensuring adequate protection for U.S. intellectual property rights resulting from bilateral S&T agreements.

Talking Points

- President Reagan has directed USG agencies to take into account, when considering international agreements on science and technology or providing bilateral S&T assistance, whether countries adequately protect U.S. intellectual property rights.
- Improved protection of intellectual property is a major U.S. priority. We intend to continue seeking improvements bilaterally, as well as multilaterally in the GATT. Including protection of intellectual property rights as a criterion in concluding S&T agreements is one example of this emphasis.
- As you know, S&T agreements benefit both of our economies by providing incentives for creative and inventive activity and also providing for access to technology developed as a result of such efforts.
- The Technology Transfer Act of 1986 authorizes federal laboratories to issue licenses to private organizations to develop inventions made at the laboratory. U.S. government researchers can not only patent such inventions, they can receive a percentage of the royalties from their inventions that are successfully commercialized. Thus, inventions developed through government research are no longer to be made available at no cost to all interested parties.

-- Because of these changes and because of the increasing "high technology" content of U.S. trade, the USG is placing greater importance on good stewardship of intellectual property arising from government-sponsored research. The United States has noted repeatedly our concerns with serious deficiencies in India's protection of intellectual property and enforcement of rights. Recently, both U.S. and Indian private sector representatives expressed some of the same views at the U.S.-India Joint Business Leaders' conference.

-- We have yet to see substantial progress in areas such as product patent protection for pharmaceuticals and agricultural chemicals, terms of patent protection, or removal of broad compulsory licensing provisions. Current provisions form a powerful disincentive to the transfer of technology to India.

-- We are also seriously concerned with restrictions on use of foreign trademarks. We welcome India's strengthened copyright protection, but note that enforcement remains inadequate.

-- These deficiencies must adversely affect our willingness to enter into agreements providing access to technology that will not be adequately protected. We must therefore see progress in these areas and look forward to discussing with you how we can ensure that S&T cooperation between our two governments continues, while at the same time ensuring acceptable protection for the intellectual property that results from these agreements.

-- One possibility would be to address these issues in an umbrella agreement that could encompass the wide variety of bilateral S&T activities. As we continue our internal discussions on these issues, we look forward to receiving your ideas as well.

CONFIDENTIAL



भारत सरकार
विज्ञान और प्रौद्योगिकी मंत्रालय
विज्ञान और प्रौद्योगिकी विभाग
टेक्नोलॉजी भवन, नया महरौली मार्ग, नई दिल्ली-११००१६
GOVERNMENT OF INDIA
MINISTRY OF SCIENCE & TECHNOLOGY
Department of Science & Technology
Technology Bhavan, New Mehrauli Road, New Delhi-110016

DO No. 19/89-Adv(R)

Date 10.5.1990

Subject: First Meeting of Standing Working Group
on Intellectual Property Rights Issues
concerning International S&T Cooperation.

Dear Member,

In continuation of my letter of even no.
dated 4th May, 1990 on the above subject, I am
enclosing herewith a copy of the presentation made
by Dr. V. Siddhartha, OSD, DRDO at the meeting
held on 24th April, 1990 for your information.

With best regards,

Yours sincerely,

(Y. S. Rajan)

All members of IPR SWG

Telegram : SCIENCTECH □ Telephone : 662260 (PABX)/667373 (EPABX) □ Telex : 66096 & 61805 DST IN

11/5/90

Total-9

6 BY HAND
3 BY POST

Y.S. Singh
Member
Department of Science & Technology

BY HAND

P. to 02/05/90
2009-11

Dr. K.V. Swaminathan
Adviser
DSIR

Dr. V. Siddhartha
OSD - I & II
DPO, Smta Bhawan, New Delhi - 110011

BY HAND

officer on Special Duty

Dr. H.R. Bhojwani
Joint Adviser,
CSIR R of Marg, N. Delhi - 110001

BY HAND

Sri Gautam Soni,
Director
Department of Electronics, Vidyag Bhawan, New Delhi - 110011

BY HAND

Sri N.K. Sabharwal
Joint Secretary
Department of Industrial Development, Vidyag Bhawan - 110011

BY HAND

Sri A. Hoda
Joint Secretary
Ministry of Commerce, Vidyag Bhawan, New Delhi - 110011

BY HAND

Additional

Sri Sarvesh Chandra
Joint Secretary
Department of Legal Affairs, Shastri Bhawan No 110001

BY HAND

Dr. U. Trivedi
Director
Department of Science & Technology

BY HAND

3.3
7/5/90

6 by hand
3 by post
9

NON-OFFICIAL MEMBERS

Dr. Nityanand, [ex-Director, CRI], B-5, Nityanand Nagar, Lucknow

Sri Vedaranan, [ex-Controller General of Patents]
508 - e' wing,
Manju Mahal,
35, Park Mills,
Bombay - 400050

Sri P.S. Randhawa
Director
Ministry of Commerce
Vidyag Bhawan
New Delhi - 110011
BY HAND

Some salient issues relating to

IPR in S&T agreements, MOUs

and other arrangements

by

Dr. V. Siddhartha

DRDO

A presentation made to the Inter-departmental Standing Working Group on Intellectual Property Rights (IPR) Issues in International S&T co-operation.

on

24 April, 1990

in the

Department of Science & Technology

New Delhi

1. S&T agreements (by whatever name called), more than other types of agreements, result in the evolution or exchange of information-based or information-rich products, artefacts or vehicles of transaction.

Broadly, and to an approximation entirely adequate for our present concerns, the universe of discourse may be represented by three intersecting circles (Attachment 'A'), covering:

- (a) Works of fact
- (b) Works of function
- (c) Works of art.

The last should not be dismissed as not within our universe of discourse, because photo-micrographs, animation video-tapes and instructional aids are works of art even though their informational content may be based on fact or function. Similarly, in an S&T agreement involving, for example, anthropological field investigation, the rights of tribals being photographed or video-taped will need to be recognised and provided for.

2. There are three (and to my knowledge, only three) instrumentalities of S&T co-operation. These are:

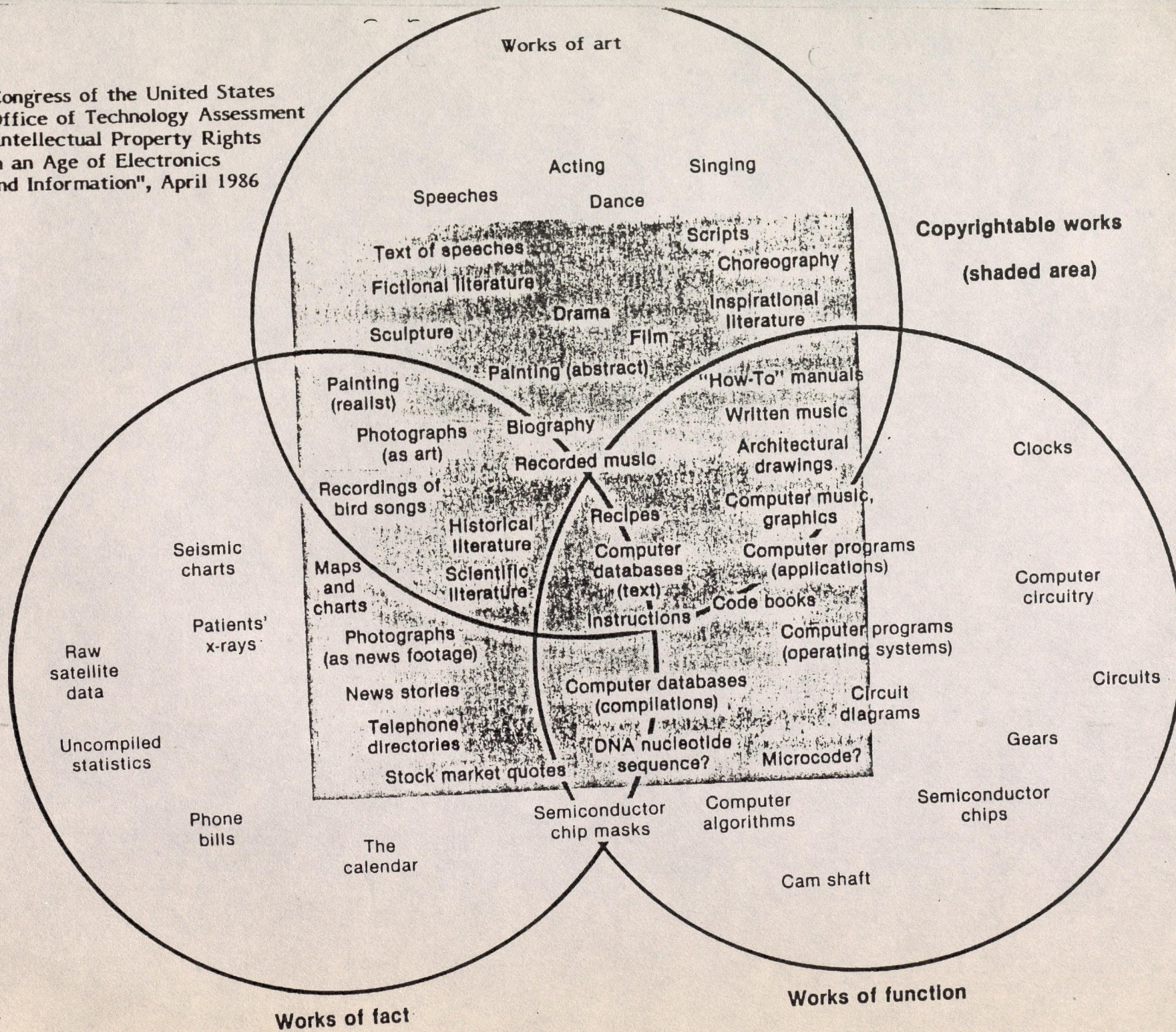
- (a) Contracts
- (b) Grants
- (c) Co-operative agreements.

In the United States, the distinctions between the three have been much debated. It was the subject of an investigation by the US General Accounting Office (equivalent to our C&AG). The net result is still a somewhat confused set of guidelines [See for example section on "Basic Policies" of the NASA Grant and Co-operative Agreement Handbook - Attachment 'B'] that are vulnerable to the vagaries of inconsistent decision-making.

3. We could of course save ourselves the bother of thinking anew, and suffer the same confusion, if we simply adopt the US/NASA definitions and guidelines. I believe, however, that we could do a lot better by changing the focus of our concern. The best way to decide on the applicability of one of the three instrumentalities above, is to focus on the disposition of the tangible and intangible ('intellectual') properties resulting from the activity promoted by the particular instrument used. This is elaborated in Attachment 'C'.

4. DRDO has entered into co-operative S&T (R&D) agreements. The clauses governing IPR resulting from the activities covered by one such agreement appear in Attachment 'D'. Although these clauses do not say so, it is obvious that the applicable law is the law in the country/territory in which the patent (or other form of IPR) is obtained. Variations of this practice include explicit territory delimitations (e.g. some CSIR agreements with foreign entities).

Source: Congress of the United States
Office of Technology Assessment
"Intellectual Property Rights
in an Age of Electronics
and Information", April 1986



Attachment 'A'

OCTOBER 30, 1983 EDITION

BASIC POLICIES

solicitation is governed by the terms of NHB 8030.6, "Guidelines for Acquisition of Investigations."

203 Criteria for Selection of Award Instrument.

203.1 General.

(a) This paragraph provides guidance on the appropriate choice of award instruments consistent with Public Law 97-258 and Office of Management and Budget (OMB) implementation of that Law. Instrument selection will be made on the basis of this paragraph 203, rather than on direct local interpretation of Public Law 97-258. This paragraph applies to all program and individual transactions where the choice of award instruments is within the administrative discretion of NASA and is not otherwise prescribed or limited by law. A variety of award instruments is available as the means for defining the terms and conditions, and the nature of the relationship between NASA and eligible recipients. The award instruments are intended to be different in purpose, application, content and nature. When properly employed, they create different relationships between the parties. Because of these differences, the decision to use a particular instrument to implement a particular purpose must be made deliberately.

(b) Procurement Contracts. A procurement contract shall be used as the legal instrument to reflect a relationship between the Federal Government and a recipient whenever (1) the principal purpose of the instrument is the acquisition by purchase, lease or barter, of property, or services for the direct benefit or use of the Federal Government; or (2) whenever NASA determines in a specific instance that the use of a type of procurement contract is appropriate.

(c) Grants. A grant agreement shall be used as the legal instrument to reflect a relationship between the Federal Government and a recipient whenever the principal purpose of the relationship is transfer of a thing of value to the recipient in order to accomplish a public purpose of support or stimulation authorized by Federal statute, rather than by acquisition, purchase, lease, or barter of property or services for the direct benefit or use of the Federal Government; and no substantial involvement is expected between NASA acting for the Federal Government and the recipient during performance of the contemplated activity.

(d) Cooperative Agreements. A cooperative agreement shall be used as the legal instrument to reflect a relationship between the Federal Government and a recipient whenever the principal purpose of the relationship is the transfer of a thing of value to the recipient to accomplish a public purpose of support or stimulation authorized by Federal statute, rather than acquisition by purchase, lease, or barter, of property, or services for the direct benefit or use of the Federal Government; and substantial involvement is expected between NASA, acting for the Federal Government, and the recipient during performance of the contemplated activity. Situations requiring use of cooperative agreements are limited. The examples and discussions set forth in Para. 203.2 shall be used in determining the existence of "substantial involvement."

203.2 Factors to Consider in the Selection of Award Instrument. The cognizant technical officer shall recommend to the contracting officer of the funding installation the selection of the research support instrument (grant, cooperative agreement or contract), regardless of the type of proposal involved, taking into account statutory requirements, NASA policies for dealing with universities, the nature of the proposed research, the manner in which it will be performed, and the nature and extent of interaction between NASA and the performer. Research grants and cooperative agreements with nonprofit institutions of higher education or at nonprofit organizations whose primary purpose is the conduct of scientific research may be made only to support basic scientific research. Any exceptions must have the prior approval of the Assistant Administrator for Procurement. As a matter of policy NASA does not generally award grants for donative assistance purposes, but only to meet program

NASA GRANT AND COOPERATIVE AGREEMENT HANDBOOK

objectives; hence, consideration of any potential benefit accruing to the recipient is extraneous to determination of the support instrument. Since prime responsibility for the pursuit of most basic studies is with the university researcher, it is anticipated that the use of cooperative agreements will be limited to those situations where the project would not be possible without extensive NASA-university collaboration. The close NASA-investigator working relationship normally expected under a research agreement does not constitute substantial involvement. Cooperative agreements would be appropriate, for instance, where a university investigator works for a substantial amount of time at a NASA center (or a NASA investigator works at the university), or when the NASA-university scientific collaboration is such that a jointly authored report is appropriate. The cooperative agreement special provision wording, required by paragraph 419, must state precisely the nature of the NASA-recipient cooperative interaction without which the effort would not be possible. Under no circumstances are cooperative agreements to be used solely to obtain the stricter control requirements typical of a contract. Subject to the statutory requirements set forth in paragraph 203.1, the characteristics generally inherent in grants, cooperative agreements and contracts are as follows:

(a) Characteristics of a grant instrument:

(i) The principal purpose is to accomplish a NASA objective through stimulating or supporting the acquisition of knowledge or understanding of the subject or phenomena under study;

(ii) The exact course of the work and its outcome cannot be defined precisely and specific points in time for achievement of significant results cannot be realistically specified;

(iii) NASA desires, or the nature of the proposed investigation is such, that the grantee will bear prime responsibility for the conduct of the research, and exercises judgment and original thought toward attaining the scientific goals within broad parameters of the research areas proposed and the related resources provided;

(iv) The research problem is such that long term support (i.e. in excess of 1 year) is required for the study to mature to maximum scientific effectiveness (however, this does not preclude shorter-term grants in special cases);

(v) Meaningful technical reports (as distinguished from the Semiannual Status Reports) can be prepared only as new findings are made, rather than on a predetermined time schedule; and

(vi) Simplicity and economy in execution and administration are mutually desirable.

(b) Characteristics inherent in a cooperative agreement include the characteristics of a grant plus the following:

(i) Substantial NASA involvement in and contribution to the technical aspects of the effort are necessary for its accomplishment;

(ii) The project, conducted as proposed, would not be possible without extensive NASA-university technical collaboration; and

(iii) The nature of the collaboration can be clearly defined and specified in advance.

(c) Characteristics inherent in a contract are as follows:

(i) The principal purpose is the purchase for the direct use or benefit of NASA's well-defined, specific effort clearly required for the advancement of a programmed NASA mission or project;

(ii) The work to be conducted is directed closely toward the solution of a specific problem;

(iii) A specific service, piece of hardware, or improved performance of a specific device is the end product;

(iv) NASA considers it necessary, and it is reasonable in consideration of the nature of the project, to exercise control over the objectives, direction, specifications, costs or methods of the research, and schedule control is desirable and feasible;

VS: April, 1990

Best way to distinguish
between the three
instrumentalities

Focus on the disposition of the tangible and in-tangible ('intellectual') properties resulting from the activity promoted by the instrument.
Thus:

Disposition of tangible property	Disposition of intangible property	Instrumentality most appropriate
Wholly-owned by giver of money	Wholly-owned by giver of money ^{1/}	Contract
Wholly-owned by recipient of money or on permanent lease to him	Wholly-owned by recipient of money ^{2/}	Grant
On temporary lease to recipient for duration of activity	Partly-owned by giver and Partly by recipient ^{3/}	Co-operative arrangement

^{1/} But recipient of money may have royalty-free licence for his non-commercial use.

^{2/} But giver of money may have royalty-free license for his own use.

^{3/} See example of elaboration in hand-out.

ARTICLE A: INTELLECTUAL PROPERTY RIGHTS

A.1 Conditions relating to Patents and similar forms of intellectual property covered by statutory protection.

A.1.1 In the case of any invention (which term shall include utility models, designs, and software) made in the course of, or resulting from, work undertaken for the purpose of this contract, the following requirements of this clause shall apply and the FOREIGN Party shall ensure that these requirements are met in the case of inventions made by third-parties employed by him, whether under sub-contract or otherwise, to undertake any work for the purpose of the contract.

A.1.2 No application for patents and/or similar forms of statutory protection shall be filed by the FOREIGN Party for inventions resulting from work undertaken for the purposes of this contract without prior approval of the INDIAN Party.

A.1.3 During the two months that follow the filing of any application for patent or similar protection for an invention covered by paragraph A.1.2 of this clause, the INDIAN Party shall be notified of the application number, filing date, the applicants's name and be supplied with copies of the description and drawings filed with the application. When so requested by the FOREIGN Party the INDIAN Party shall consider these documents as confidential. Except with the agreement of the FOREIGN Party these documents shall not be disclosed as long as the patent or patent application in question has not been officially published, within a maximum period of 18 months from the date of application. However, the INDIAN Party shall have the right to make use, or have made use of, the information in question for the purposes of the Government of India.

A.1.4 Under any patent or similar protection resulting from an application covered by paragraph A.1.3 of this clause, the INDIAN Party shall be entitled without payment to an irrevocable non-exclusive licence to exploit the invention for the purposes of the Government of India and to grant sub-licence for these purposes to anybody in India. INDIAN Party shall supply to the FOREIGN Party a list of the sub-licences granted. INDIAN Party shall exercise this option within six months of notifications to the FOREIGN Party under clause A.1.3.

A.1.5 If the FOREIGN Party declares not to take patent action, the INDIAN Party itself may take such action. In this case the INDIAN Party shall notify the application number and the filing date to the FOREIGN Party.

A.1.6 Subject to the rights of third parties arising otherwise than from work performed for the purpose of this contract, the INDIAN Party shall have the unrestricted right to copy and disseminate as it thinks fit any information and software supplied by the FOREIGN Party in satisfaction of the requirements of contract. On request by the FOREIGN Party, the INDIAN Party shall defer such dissemination for not more than six months from the date that the information was communicated, in order to avoid prejudice to patent/copyright applications which the FOREIGN Party wishes to make. In such a case, the FOREIGN Party shall comply with any request of the INDIAN Party to resubmit the information/documentation in such form as to permit dissemination by the INDIAN Party of all information not germane to the patent/copyright applications.

A.1.7 The FOREIGN Party shall ensure that the requirements of this clause are met in the case of intellectual property rights generated by third parties employed by him, whether under sub-contract or otherwise, to undertake any work for the purposes of this contract.

A.2 Conditions relating to intellectual property not covered by statutory protection

A.2.1 Subject to the rights of third parties arising otherwise than from work performed for the purposes of the contract, in addition to all information provided by the INDIAN Party to the FOREIGN Party, all specifications and designs of deliverable hardware and software, manufacturing know-how, experimental data, test results and interpretations of the data and results and conclusions therefrom shall remain the property of the INDIAN Party and shall not be divulged or cause to be divulged to any third party or otherwise made public or cause to be made public by the FOREIGN Party. The INDIAN Party shall, upon request of it, grant to the FOREIGN Party a non-exclusive licence for the utilisation of such intellectual property owned by the INDIAN Party subject to such export-area restrictions as the Government of India may impose. The FOREIGN Party shall not pay to the INDIAN Party any Royalty or Fee for such licence other than what may be mutually agreed for the utilisation by the FOREIGN Party of information initially made available by the INDIAN Party to the FOREIGN Party to execute the contract.

Y S RAJAN
ADVISER, DST /
EXECUTIVE DIRECTOR, TIFAC
Ph : 666073

No. TIFAC/2/89
July 7, 1989

My dear Dr Ramaseshan,

I am sending this letter to you pursuant to our discussions on Current Science. You may use the ideas contained in this letter in your editorial comments and other suitable places. I would request that my name is not quoted.

I am particularly happy to note that with its new Editorial Policy, Current Science is trying to orient itself to make science and technology more relevant to the country's requirements.

Your editorial comment on 'Challenging Areas in Chemical Sciences' in Current Science Vol 58, No.8, April 20, 1989 is particularly relevant and it is worded with your characteristic (sugar coated but) sharp focus. I do not know how many scientists bothered to read it or understood after reading it or care about it after understanding it. An idea contained therein is worth raising again and again with respect to a number of "holier - than - cow " programmes we are promoting in the country.

I quote your words for convenience :

Quote :

There is, of course, the larger issue that can be raised : the consensus of the scientists in what they should in the next five years may be good for the scientific community but is it the best for the country?(stress is mine)

- Unquote

The question is not 'is it the best for the country' - are they at all useful? No point is blaming industry and others that they do not take indigenous technology etc. I do not claim that there is no problem on that side. But the scientific groups do not bother to go beyond idea stage or publications. I am sure that the individual scientists are not to blame. The value system the S&T community has built up over the decades of unquestioned Govt. support, is for the number of publications, higher academic qualification, recognition in international forums including awards by foreign academies and so on. I am sure personally that we cannot produce a Raman by state-support. But million dollar laser instrumentation based on Raman effect will come about only with orchestrated actions.

The fact that R&D can fructify into the national system only when it can go through the phases of pilot phases, where relevant, trial production, marketing, after-sale feedback and so on. In fact at the R&D stage itself it will be good to assess the markets and take steps to develop market and production systems. Many of these activities called sometimes as 'systems analysis or systems management' are considered mundane by the 'powers - that - be' in the S&T peer evaluation system. Those who try to do it are dubbed as 'coordinators' or 'managers'.

Well one can go on into a number of such organisational and motivational issues. Bright MBA's may be 'used to sell soaps' by private industry - but an S&T manager (he would like to be called as 'scientist' - not as manager...) cannot use that MBA to judge the products or processes on which R&D may be profitable.

Well the situation cannot prolong for too long. I, for one do not belong to class of people who say 'leave everything to market forces. In the Indian situation it is not that easy. Japanese and Koreans did not leave everything to market forces. Americans are moving towards strong Govt. intervention. But at the same time, 'leave everything' to scientists' is not the syndrome that will work. It has failed the country over the four decades. We have to rephrase Churchill :S&T is too serious a matter to be left to the scientists alone'.

Unfortunately, we have not developed a class of administrative and planners who can understand complex issues and decide. So far most of our administrators have funded or supported science in blind faith (and perhaps with awe). The same group can turn cynical and jettison the faith. Then we may have a national crisis (which may not be perceived as such in the beginning because the shouts by even the better of S&T community may not be taken seriously by the public or concerned politicians because S&T community have lost credibility in the public eye.) The elder generation can retire with its laurels and blame the new breed of planners / administrative and blame 'liberalisation', 'policies' etc. The younger generation of scientists is so much under the thick layers of techno-bureaucracy created by S&T leaders, that they cannot raise their voice(s) - many may not even perceive the national crisis because they can only the 'pretty-crises' created by their own 'bosses' - they are bitter in their own ways.

This is where, I feel journals like Current Science, can help by really discussing issues of applicability of Indian S&T in the Indian contest. If it can open a debate on the relevance of various (existing & planned) programmes of the current S&T institutions 'without fear or favour', it will be a great national service. Future of S&T in the country should not be made dark because of the past sins. We should ensure to the extent possible that 'the sins of the fathers are not visited upon the sons'.

You will find an unfortunate situation that many good and frank ideas will be sent to you as anonymous letters or sent with a request not to publish the name. (As I have done). It speaks of the scientific temper we have created in the country in the scientific establishments.

But you have to evolve the methods. Your career as a teacher has given you the ability to empathise with the youth; your sense of humour is very useful in putting forth difficult ideas effectively in a hostile situation. I suggest that you open a channel of communication with the youth, planners, administrators and industrialists and seek their frank opinion on the 'current state of S&T in the country and its relevance' - if some of them can also give some concrete suggestions well and good. You have to bring the ideas to the print. Is it a glasnost which may lead to a prestroika? We should hope for it in the interest of the country.

If my ideas are meaningless, please feel free to tell me.....

pannal
With best regards,

Yours sincerely,

Rajan
(Y S RAJAN)

Prof S Ramaseshan,
Editor,
CURRENT SCIENCE
C V Raman Avenue,
Bangalore 560080



MARKETS AND FINANCE

THE SUNDAY TIMES OF INDIA, NEW DELHI, JULY 9 1995

Sidestep patents and reap a rich harvest

By N Suresh

Business Times Bureau

The world's first patented pacemaker was implanted in a heart patient in the United States in 1958. This invention is now 37 years old. Considering the longevity of the invention, one would expect that scope for further improvements to file new patents would be limited.

But the reality is different. In 1969, there were seven patents filed on pacemakers in the US. But things changed drastically in the 1990s. Over 130 patents were filed on inventions related to pacemakers in 1994 in the US alone. According to an analysis of these patents done by Mr R.Saha of the department of science and technology (DST), 87 per cent of these patents on pacemakers were granted to the industry.

In 1980, 82 per cent of the patents on pacemakers were held by five companies. But in 1993, 14 companies owned 75 per cent of the patents. This means the near monopoly of the five companies was broken in a decade. Nearly a third of the new patent applications were from other countries: Germany, Sweden, the Netherlands, Australia, UK, France, Italy, Japan and Argentina. Interestingly, the top three patent-holding companies are also the market leaders in this segment in India.

This example belies the notion that no new patent is possible in an established product segment. Opportunities galore in disclosed Saha's

taken up patent-ary and

the scientific community have now got into the act to grab the new opportunities. And patenting, patent search, patent filing, patent information etc., are the buzzwords in the government and scientific circles.

A few examples.

* The government is sprucing up its Patent Information System (PIS), based in Nagpur, with the help of the United Nations Development Programme (UNDP). PIS is an office created in 1980 under the Comptroller General of Patents, Designs and Trademarks, ministry of industry. The office, which was till the other day neglected by the ministry, now has data on patents from 55 countries.

* The Technology Information, Forecasting and Assessment Council (TIFAC) of DST has set up a patent facilitation cell (PFC). The Planning Commission has granted Rs 50 lakh to the cell for 1995-96, routed through the ministry of science and technology's Science and Engineering Research Council (SERC). The government will soon grant another Rs 4.5 crore for the cell in the next four years.

* The Council of Scientific and Industrial Research (CSIR), a major player in the patents arena, too, is strengthening its patent cell. It is one of the priority areas of the new CSIR chief, who wants it to grow into the centre of patent activity. The Parliamentary standing committee on science, technology and environment has also recommended making this cell a storehouse of information.

* Industry, too, has got into the act. For the first time in many decades, two national seminars to create patent awareness among industry, scientific institutions and patent lawyers were held in Banga-

lore (April) and Bombay (June) this year, with help of TIFAC. Among the sponsors were ICICI and the Bombay Chamber of Commerce. The Confederation of Indian Industry (CII) may host the third meeting in this series at Calcutta in July end, or early August.

* What is a patent?

A patent is a legal monopoly which is granted for a limited time to the owner of an invention by the state. However, its exploitation may be limited by other laws such as health and safety regulations, or the food and drugs regulations, or even by other patents. The patent in the law is a property right and it can be given away, inherited, sold, licensed and even abandoned.

* How is an invention interpreted?

To be patentable, the invention must not only be novel, but also involve an inventive step. Simplicity is not necessarily an objection for securing a patent. This means even if the object is attained by a perfectly simple and common process, yet there should be an inventive step if the inventor has developed a variant which will render more useful results as disclosed.

* How is the novelty of an invention determined?

The novelty is judged taking into consideration the knowledge available in India and else-

Said TIFAC's executive director Y S Rajan, 'We are only scratching the surface with the... We have a lot of initiatives enabled... perspectives betw... tutions a

where in the field at the time of filing the application for a patent. The invention should not be known anywhere in the world prior to filing of the application.

CSIR's new director-general R A Mashelkar notes, 'We have a lot to do even though CSIR as a group files the maximum number of patents, 250 out of the 3,000-odd filed in India every year. Just 2 to 3 per cent of patents are filed by aca-

where in the field at the time of filing the application for a patent. The invention should not be known anywhere in the world prior to filing of the application.

* What are intellectual property rights (IPRs)?

IPRs is a general term covering patents, registered designs, trademarks, copyrights, layout design of integrated circuits, trade secrets, geographical indicators and anti-competitive practices in contractual licences.

* What are the legislations covering IPRs in India?

Patents:The Patents Act, 1970. An ordinance issued on December 31, 1994, has brought some changes. The ordinance is yet to be ratified by Parliament.

Design:The Design Act, 1911.

Trademarks:The Trade and Merchandise Marks Act, 1958.

Copyright:The Copyright Act, 1957, as amended in 1983, 1984, 1992 and 1994; and the Copyright Rules, 1958.

Layout designs of integrated circuits:No legislation exists.

demics. Every year we produce 4,000 Ph.D students. Even if a frac

applications every year. The number of patents filed in the US has increased by 47 per cent between 1987 and 1993, from 68,000 to 100,000. On the other hand, every year 1000-1,500 patents are granted to Indians and another 3,000 to foreigners by the patent office. The number of applications received every year are about 3-4 times more.

It is a tedious task to handle patent applications. For every application received, the office has to search worldwide patents for the last 20 years to determine whether the new claim is 'novel'. This is mandatory before accepting a patent application and assigning a provisional number, explained a senior official. Due to lack of computerisation, this involves manual search of the government's gazette notifications about patents for India and other countries.

In the coming years, the number of patent applications is bound to increase because of the new awareness. 'The number of applications should increase by four to five times in two years and by a factor of 10 in some more years,' predicted Mr Rajan.

Added another patent expert, 'We will need at least 50 to 60 patent registration centres.'

Many institutions have started work on their own. For instance, the National Chemical Laboratory, Pune, has set up a patent information cell on chemicals. Explained TIFAC chief Rajan, 'TIFAC's patent cell will also keep track of developments in many fields. Because when we analyse patents filed elsewhere, we can

creating patent awareness among scientific institutions. Adds Mr Rajan, 'Before starting any research project, we will advise them to do a patent search and eliminate duplication of work. And during the research work, scientists can modify them into patentable steps. TIFAC will help in patent search and filing an application.'

To facilitate this, TIFAC has prepared a comprehensive guidebook on patents. It has also got an updated list of 147 attorneys across the country who specialise in patents and trademarks.

CSIR's patent unit has developed a computerised database on Indian patents granted since 1972. The database provides the flexibility to retrieve information on any of the bibliographic items—patent No., application No. and date, publication date, applicant's and inventor's names, priority data, international and Indian patent classifications—through catchwords. Another CSIR laboratory, the Indian National Scientific Documentation Centre (INSDOC), Delhi, provides information from the international databases on patents.

The growing patent awareness is a good sign. And Indian scientists and entrepreneurs should come forward in large numbers to take advantage of the patent system. For now, there are hundreds of international patents on even things like cages for domestic pets, honey-roasted nuts and microwave oven designs. After all, if 186 patents can be filed on cardiovascular

It's a woman's world

Male classical dancers have few takers these days, writes Ashish Khokar

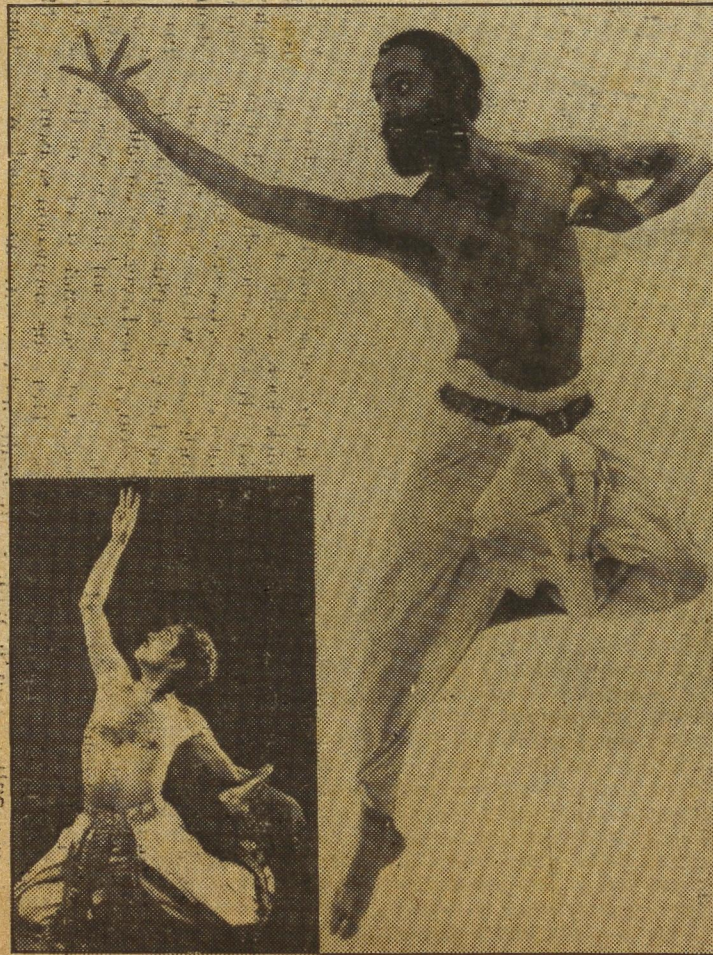
Santanu Chakraborty has a problem. "When I go to sponsors and organisers they ask me how many girls will dance with me on stage? When I inform them that I am a solo classical dancer, they look plainly disinterested," complains the disciple of Sonal Mansingh, depressed and looking for direction.

Santanu's problem is that he is a male in the woman-dominated world of classical dancing. Uday Shankar and Ram Gopal shone in a different age. When there was a craze for Indian exotica in the West, which was fascinated by Shankar's varied offerings and Gopal's artistry.

The generation that followed threw up a lot of *gharana* artistes: Birju Maharaj, Devi and Durga Lal, Gopi Krishna. Then there were the traditional male dancers of Kathakali, Kuchipudi and Chhau.

Until these bastions were also breached. Today Kuchipudi, once an all-male affair, has more women practitioners than men. Why, even Sattriya, the preserve of celibate monks of Assam has capitulated. Kathakali, too, has women dancers.

Kamadeva is no more; Rohinton Cama and Manish Chawla have left dancing; Justin McCarthy has become a teacher and Navtej Johar performs occasionally. Ramli Ibrahim pursues Odissi in Malaysia and Pratap Pawar performs Kathak in London.



Withering heights: Navtej Johar and Santanu Chakraborty (inset)

In India, there is only one modern dancer of repute: Astad Deboo. The others have found teaching and arts administration more lucrative. Kathak offers some possibilities professionally, and dancers like Rajendra Kumar Gangani, Maulik Shah and Devanand show potential. Bharatanatyam has Lada Guruden Singh and contemporary dance, Bharat Sharma, Naresh Kumar and Santosh Nair.

That's just a handful. "Part of the problem lies in the fact that male dancers give the impression of being effeminate. Their mannerisms get set," holds Rahul Ranadive, a cameraman who shoots for the BBC. There are some people who feel dance as a profession is associated with "frills and fancy, not serious enough".

Seminars on the theme of male dancers have been organised and a Natyakala conference is scheduled in Madras in December. The theme is *Purush*. A dwindling species, considering that at the Purush seminar in Bhopal last year an all-India representation of male dancers was less than 20. Raman Kutty Nair, Kelucharan Mahapatra, V.P.Dhananjayan (who dances with wife Shanta as a partner), Raja (with Radha) Reddy, Birju Maharaj, Vedantam Satyanarayan Sarma, Vempati Chinna Satyam, Amanur Chakyar, Sachin Shankar, Narendra Sharma, Singhajit Singh, Astad Deboo, Kala Krishna...

Add one or two others and the list ends.

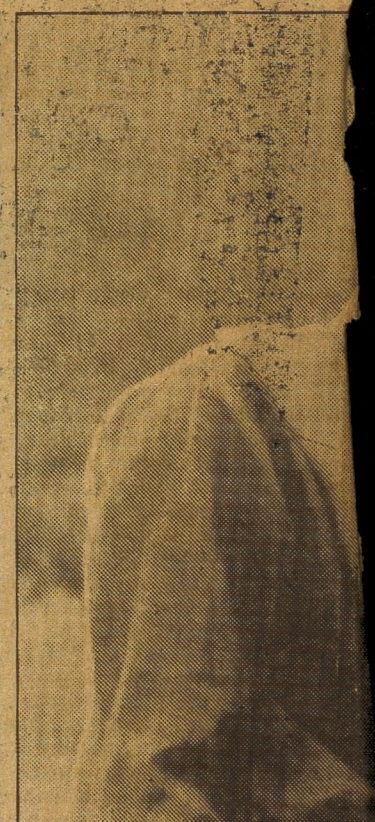
"In a year, I need at least 10 programmes to survive modestly. After paying all the costs—costumes, musicians, publicity and what not—I am left with nothing. Most people who offer support do it as a favour, not out of genuine interest. It is demeaning, if not totally discouraging," says Santanu who is nearing 30. "After ten years, my body will refuse to be my best tool, who will see me dance?" he adds, echoing the apprehensions of his brethren.

State support is woeful. Most schemes are temporary: a two-year, Rs. 1500 per-month fellowship if one passes all hurdles of selection. And if one finds favour with the personal whims and fancies of the committee in charge. In contrast, big established institutions get aid though they may not need it. Or, sometimes, may not deserve.

Major performing platforms, like Konark or Khajuraho, are of little help. The Khajuraho Festival organisers last year did decide to project male dancers. They shortlisted Meenakshi Seshadhri to perform Kuchipudi with the excellent male dancer, Murthy. On the billed evening, Ms Seshadhri came alone and performed Bharatanatyam.

Today, the most productive (read money-making) platform is films. Where a Prabhu Deva can become a mega-success with his talent, timing and Michael Jackson technique. Where a Govinda and a Mithun flourish as "dancing stars". Where a versatile Kamalahasan embellishes his acting prowess with trained dancing.

In the meantime, the Santanus of Indian dance languish on the fringes.



Mr Twinkle Toes.

Prabhu o

FILM REVIEW

Humse Hai Muqabla / Shiela

Rating: ★★★

Prabhu Deva is finally here. After having built up a sizeable coterie of admirers with his tapping numbers 'Urvashi' and 'Muqabla Muqabla' that have been storming charts on television, the dancing star from the South is all set to what his predecessors could. Prabhu Deva hopes to conquer the cold shoulder of the hitherto greeted South. What? Mamma juna, cot

Now he's no

Ajay Damle is an angry man today. Angry and on the defensive. For Ajay Damle came but could not conquer. Despite his assiduous attempts at image building - the bulging biceps, the steely exterior, the bullet-dodging demeanour, the impeccable drag act - Damle, the urbane of *Baazi*...

