

with the local Government or public authority that whenever there is a requirement to tap these springs for public use, they may not resist it and give way to its authorized tapping.

It must, however, be remembered that springs sustain thousands of life forms including plants and trees vital to a balanced eco-system, and rampant uses of these springs would seriously affect the environment. Also, the seeping spring waters augment the ground water re-

charge of the lower aquifers to support the life of the existing springs issuing from these aquifers. Depending on their locations, these springs at lower elevations are either utilized by the local inhabitants for drinking/irrigation purposes or flow downhill to join the mainstream and continue through the hydrological cycle. Therefore, whether for public or private use, while tapping a spring, a trade-off must be made considering the local needs and downstream users. Emphasizing only

on local human needs may lead to severe intercommunity conflict and negative environmental consequences.

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## Pharma research for tropical diseases

The discovery and development of new medicines for tropical diseases has the handicap that the need for affordable medicines makes it difficult to recover the high investments in research and development (R&D). This makes a case for doing such R&D in countries such as India, where the costs of developing new medicines may be two or three times lower than in Europe or the USA, while the gestation times may be longer. The recent change in the patent law in India (January 2005) has created an environment that is conducive for increased investments in drug discovery and the protection of Intellectual Property.

In this regard, it was of interest for me to write to five pharma companies and enquire of their interest in setting up pharma R&D centres for tropical diseases in countries such as India. Based on the responses I received it appeared that the following course of action is appropriate.

If the turnover of the Indian pharma industry is taxed at 0.5 to 1%, this would generate sufficient funds to finance pharma research for two or three tropical diseases on a long-term basis. Other countries, such as China, South Africa, Brazil, Mexico, Argentina and Israel could adopt a similar approach. This would create a global critical mass of at least 2000 scientists in pharma research for tropical diseases, to ensure that new medicines for such diseases are discovered well in time.

Past experience in the global pharma industry has shown that about 200 scientists and a time period of about 10 years are required to generate one new medicine, for any indication (disease). Phrased differently, the success rates in clinical R&D are usually below 20%, while the same is true for pre-clinical R&D for reasons which have been elaborated elsewhere by others.

This was proposed to the Government of India in July 2005. It is good to know that the CSIR is setting up a new drug discovery centre at a cost of Rs 1.90 billion (US\$ 45 million). Hopefully, similar plans are in place or in practice in the other countries mentioned above.

This will ensure that pharma research for tropical diseases receives the needed support and that new medicines for such diseases are discovered and developed well in time. Presumably, this will also lead to increased investments in basic research which is essential for successful pharma research in tropical diseases.

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## The century of mind

A debate on the need and relevance of Intellectual Property Rights (IPR) in India has raised many interesting, pertinent and also some pointless questions. The all-pervasive effect of IPR cannot be belittled in this era of global permissiveness. R. A. Mashelkar, the passionate champion of intellectual property in India, acknowledges the significance of innovation in production and knowledge creation, and christens this era as 'the century of mind'. He has noted 'The breathtaking speed at

which science is moving is not only shaping our present, but also going to dominate our future. A nation's ability to convert knowledge into wealth and social good through the process of innovation is going to determine its future'.

Every member of the World Trade Organization (WTO) has to unconditionally sign the much debated, but little understood Agreement on Trade Related Aspects of Intellectual Property Rights (TRIPS). India is now on the verge of a Knowledge

Revolution, given the sudden surge in unearthing the country's traditional/indigenous knowledge. This, along with the presence of Multi National Corporations (MNCs) and their intellectual property (IP) registration fervour, has pushed India on a precarious and catch-22 position on IP – whether positive exploitation has to be made or defensive protection should be given is the question.

The economics involved in any form of IP exploitation or knowledge mana-

gement process is both heartening and disquieting. For India, the core areas of economic resolve that would machinate with IPR, *inter alia*, will be: (a) Transfer of technology, (b) Licensing agreements, (c) Drug development, (d) Research and development in universities and educational institutions, (e) Foreign direct investment (FDI) and technology absorption.

The present epoch is one that values knowledge and its usable variants. A Knowledge Economy is one in which information will be the raw material, and functional design of work, its upshot. This would engender 'brainpower' industries like biotechnology, genetic engineering and real time communications to flourish. It is in such an economy that knowledge workers – those who use information to comprehend the rationale for their actions – will dominate, and Indians are fast becoming so. It is high time colleges and

universities comprehended the significance of IP.

In this regard, the document 'Guidelines for Awareness, Protection and Management of Intellectual Property Rights (IPRs) in the University System in India' by the University Grants Commission (UGC) is highly commendable. The report is so designed as to maximize the benefits that the educational institutions and the researcher(s) would get from their intellectual capital, by (i) stimulating higher levels of innovation through a comprehensive system of rewards, (ii) ensuring timely and effective legal protection for their IP and (iii) leveraging and forging strategic alliances for enhancing the value of their IP.

This scheme has been conceived with the objectives: (a) To create awareness and develop a culture for protection and management of IPRs in the universities.

(b) To facilitate protection and management of IPR created in the University system in the country by creation of an enabling environment that fosters innovation. (c) To assist researchers and faculty members to have access to the best practices for identification, protection and management of IPRs in order to maximise the benefits and returns from investments in research.

As the UGC has rightly put it, 'Innovation is the key to sustained economic development and source of competitive advantage for nations. Indian research and development has to be globally competitive to fuel this innovation'.

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## NEWS

### MEETING REPORT

## Genes, life and empire\*

The domains of intellectual property have been vastly expanded in recent years with an increasing range of discoveries and inventions coming under the scope of patentable entities. The promise of gene as determinant of disease and health, especially, has resulted in what has been termed as a 'genome gold rush' and pushed the boundaries of intellectual property in this realm in unforeseen ways. Broad scope patents are being granted to all biological entities including genes, proteins, cells, modified animals and plants. Tragically, though the patent system is intended as a provision (by the state) to reward innovation, current patenting practices have led to private enclosure of what was regarded as common heritage, whether plant and animal varieties, genomes, or information/knowledge. Is the expanding 'anticommons' created by extensive patenting conducive to further innovation? What is its impact on the freedom of scientific research? What about the consequences of patenting for

the promise of the Human Genome Project, which was to provide solutions to health care for all of humanity? Are current interpretations of criteria of patentability, namely novelty, non-obviousness and utility for a scientific discovery, adequate to the changing times or should they be redefined? How does one protect indigenous knowledge from 'bio-piracy'? Is there/should there be a moral or ethical dimension in patenting? These questions loom large against a trend of the rising anticommons, in which intellectual property rights have been greatly strengthened.

Some of these issues were elaborated and discussed at a session (panel) entitled 'Genes, Life and the Empire' organized at the Critical Legal Conference. Papers presented by three panelists provided diverse spotlights on the landscape of IPR and biology.

The session chairperson (Chitra Kanabiran) in her opening remarks laid the background for the current era of patenting of life forms, referring to the landmark judgement by the US Supreme Court in 1980, *Diamond vs Chakravarty*, as the watershed for patents in biology. This

judgement ruled that the 'oil-eating bug' was patentable and was subsequently extended to allow patenting to virtually all life forms. A 'patenting boom' that ensued post-1980 accompanied the 'biotech boom' of the 1980s. Both of these developments were seen as manifestations of the commercialization of biology.

Dwijen Rangnekar (Centre for the Study of Globalization & School of Law, University of Warwick, UK), in his paper (A shrinking of the public domain in agriculture: A cartography of contemporary developments in intellectual property rights in plant material) discussed developments in intellectual property laws in relation to plant material. The paper examined the different ways in which the concept of public domain was framed in the literature in law and in economics and brought up the notion of the 'anticommons', a realm in which multiple users possess effective rights of exclusion from a scarce resource. Applying the concept of the public domain to knowledge, it put forth the premise that knowledge is not always completely 'free' and accessible, since the economy of knowledge renders

\*A report of the conference held during 1–3 September 2006 at NALSAR, Hyderabad.