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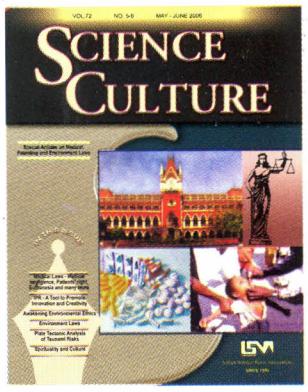
EDITORIAL

WHAT GOD HATH WROUGHT !



Law governs everything. Nature is governed by laws, science is explained by laws, society is controlled by law. A natural question may be whether law is a science, especially in the face of familiar terms like legal science and juridical science. While I do not profess to know the exact answer, it can be safely argued that law is not a science in the same vein as mathematics, physics or chemistry; but within a broader definition of science as proclaimed by Einstein, "The object of all sciences is to coordinate our experiences and bring them into a logical system". Law does not lend itself to be quantified and expressed by a set of numbers for reliability and repeatability in a laboratory, but it shares a common thread with science in that it is also an evolving subject which get corrected and amended as new experiences or observations unfold. We will see below how laws got changed or amended with human experiences as well as with development of science and technology or with new discoveries and inventions.

Many view law as an endless litany of precedents and statutes, clauses and sub-clauses between party of the first party and party of the second party, in a language bordering on arcane (popularly referred to as "legalese"), and thus not exciting as an academic subject. While my comments are neither meant to advocate nor discourage our younger generation from pursuing law as a career, from a scientific point of view it cannot be denied that making law is challenging in the context of rapid advancement of science and technology. There is perhaps no area more in demand among legal academics than 'law and science' or 'law and technology'. These academics are career professionals investigating rules and regulations that should cover newly developing frontiers ranging from computer networks to embryonic stem cells.

In 1844 Samuel Morse invented telegraphy. He was able to send an electronic message between the two cities in USA— Washington DC and Baltimore, Maryland separated by a distance of about 37 miles. The message transmitted through cable was "What God hath wrought!", a biblical quotation to express awe to the natural force of electromagnetism. Although Morse had not discovered electromagnetism, he was successful in using its principle to create the world's first inter-city 'internet' and justly got credit as the inventor of telegraphy.

In his patent application, however, Morse claimed a broad coverage for the use of electromagnetism to produce characters at a distance by any means. Although he had invented a particular mechanism to transmit messages in writing, his patent protection application tried to bar the rest of the world from using it in any other method of innovation. The Patent Office allowed the patent to Morse without realizing the implications of the technology and the controversies that would grow out of it. The point of contention was that granting the patent as worded in Morse's application, was equivalent to granting a patent on the laws of electromagnetism. When challenged in court, ironically Morse's own message identifying nature ("God") as the prime force behind his invention acted against him. The discovery of a principle of nature, according to law, is not patentable until it is reduced to a specific structure in which the principle can be used to achieve a useful, concrete and tangilble result. For example, Newton's Law of Gravitation is not patentable, but a balance, which uses this principle to weigh objects is patentable. The broad patent claim to every use of electromagnetism for transmitting printed information at a distance was found to be invalid for the reason that according to Morse's own confession, his invention was really the work of nature. He was eventually granted a patent for the specific method of transmission invented by him.

What constitutes patentable subjects is a big issue to any Patent Office. The argument as to what falls within the realm of nature and what belongs to human innovation again resurfaced in 1970, when General Electric (GE) placed a genetically engineered organism for patent protection. The Patent Office rejected the patent application, claiming it was not a patentable subject. GE stuck to their argument that the bacterium was not natural, but genetically altered to make it capable of eating oil and therefore patentable. The debate continued at length until the US Supreme Court ruled that patent rights can be extended to a living organism made by humans.

New scientific discoveries and inventions continued to confront the patent examining authorities to decide which is patentable and which is not. For instance, in the nineties when dot-com companies were trying to protect their innovations in the new electronic medium, questions arose whether a business process implemented on a computer system could be patented. A financial company developed a data processing system for calculating assets and share prices in an investment portfolio. The patent file was initially rejected on the ground that a business method is an improper subject for patenting. Finally higher courts held that a process of converting data by a computer, through a series of mathematical calculations, to produce a final share value prediction constituted a "useful, concrete and tangible result", satisfying the patent requirement.

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Another controversial area in terms of patents is the gene due to its dual characteristic. As a chemical compound, it consists of repeating units of nucleotides which fall perfectly into the subject matter of patentable items in the category of new chemical compounds. However, a gene also contains informational code that the cell uses to manufacture a protein and therefore cannot be considered as a mere conglomeration of atoms bonded together. Genes provide instructions to implement the basic process of making the protein it encodes and therefore define a fundamental process that can be described as "wrought" by nature. This distinguishes genes from proteins and other chemical compounds. In spite of this, first gene (human endorphin) was patented in 1982. Initially the discovery of new genes was very slow, but with the development of DNA sequencing methodologies, new genes started emerging at a furious rate, and patent applications started piling up in the Patent Office. There was also a widespread concern that the biotech industry was out to patent the human genome. Academics and research group voiced their protests that gene patents were impeding basic research and extorting high royalties when used in the field of diagnostics.

To control this mushrooming of genes produced by brute force, policies for gene patenting were formulated. According to the new policy, an inventor needed to show that the invention was new and establish its 'utility requirement' (i.e. to establish what specific 'tangible result' the gene will produce) to get a gene produced. Therefore, the knowledge that a DNA codes for a transmembrane receptor protein without knowing that it is associated with a kind of disease or other situation connecting with real life applications, cannot satisfy enough reasons to be patented.

Patent laws protect new ideas that have functional manifestations as invention, while the Intellectual Property Right (IPR), which came into effect in more recent times, protects all forms of expressed manifestation of information and ideas. Intellectual property supports the idea that a subject matter is the product of the mind or intellect and needs to be protected in the same way as other properties.

Computer technology presents many new challenges to moral and social policy issues, such as privacy, maligning etc., under the common name of cyber-crime. Cyber-crime is broadly used to describe any criminal activity in which computers or networks are used as a tool, a target or a means to perpetuate further crimes. Cyber-crimes in which the computer is a tool of the criminal activity include spamming, certain intellectual property crimes and criminal copyright crimes, while cyber-crimes in which the computer or network is a target of criminal activity include unauthorized access, denial-of-service attacks, etc. In India, the Information Technology (IT) Bill was passed by Parliament in May 2000 which introduced the Information Technology Act 2000. The IT Act 2000 aims to provide the legal framework so that legal sanctity is accorded to all electronic records and other activities carried out by electronic means, and includes the framework for cyber-laws. Although it is possible to trace 'virtual footprints' and locate the place of a cyber-crime, the most challenging job for the law enforcement authorities is to identify the person who did the crime.

Law also deals with subjects related to social, moral, political and religious issues. One such issue, which has evoked debate and controversy in equal measure, is euthanasia. Euthanasia comes from a Greek word (*eu* = good and *thantos* = death) meaning "good death", originally referred to intentional mercy killing. But the word euthanasia has acquired a more complex meaning in recent times. The proponents of euthanasia believe that a person who has lost all his human 'faculties' except biological life has the right to end his suffering and leave the world in a dignified manner. On the other hand, those who contest euthanasia believe that man does not have the right to end another person's life no matter what pain they endure. Judges say that they believe in the 'sanctity' of life (although it is not always clear what that term expresses), and legal scholars agree that the main issue revolves around the question of withdrawing life support (feeding, nutrition and care) for a person in persistent vegetative state (PVS).

PVS is a state in which there is an extensive damage to the cerebral neocortex, which is responsible for most of the higher functions of human beings such as personality, memory, thought, social interaction and purposeful and other emotional acts. The brain stem, which is responsible for actions such as respiration, heart beat etc., remains intact and the person does not require any support other than nursing and feeding. Properly diagnosed PVS patients do not have any potential except to age and die and this has caused the debate to revolve around whether the act of breathing, without any faculty of living a human life, should be called life. The dichotomy is that if PVS is diagnosed right, then any treatment, by definition, is meaningless— thus what doctors are doing in the name of treatment (supplying food and nutrition) is not in the best interests of the patient.

There are different types of euthanasia. Passive euthanasia is the process of hastening death of a person by withdrawing life support system such as medication, food and water and letting nature to take its course. In active euthanasia, on the other hand, the death of a person is hastened through direct action such as injecting death-assisting drugs. Whether the law should permit voluntary euthanasia or physician-assisted suicide is one of the most vital questions facing all modern societies. With people living longer and longer because of medical advances, the question of euthanasia and other ways of ending life is coming into focus. Proper legislation is required in order to avoid unwarranted and irresponsible interference with an individual's right to make an autonomous decision to refuse life. This subject is so controversial that euthanasia has been accepted legally in some nations and only in some states of the United States. In the celebrated case of Terry Schiavo, a Florida resident who entered PVS in 1990 after a cardiac arrest, the Government repeatedly interfered with her husband's request to remove her gastric feeding tube and he had to petition fourteen appeals, both in the state courts and at the Supreme Court, before her life support was allowed to be removed last year.

I will now discuss an interesting '*gedanken*' (thought-experiment) problem to tackle criminal laws. Let us imagine that human beings are immortal. If this requires too much of a stretch of the imagination let us assume that humans have an average life-span of 200 years, which is not impossible in the not-too future considering the rapid rate at which human longevity is increasing. It would be interesting to see how criminal law will tackle this phenomenon. The extent of punishment to those who break the law is dependent on the average life span of human. Thus, sentencing laws would need to change to account for increased human longevity and ensure that punishment is commensurate with the crime committed. Imprisonment is viewed as a punishment which deprives the offender a finite resources of his life— time, which also depends on the severity of the crime. A 20-year term of imprisonment is likely to cause a lot of hardship in the context of a 60-year life, but quite insignificant in a life-span of 200 years. One may use the proportionality theorem and argue that in the life-span of 200 years the same punishment will be increased to be about 67 years (note that the proportionality theorem will not work if a human being is immortal). On the other hand, if a man is killed at the age of 25 years, a homicide offence may be more serious when a life is cut short by 175 years as compared to 45 years.

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In conclusion, law is essentially an interesting subject full of challenges, and with an enormous scope of intent intellectual exercises. We present in this issue some such subjects pertaining to moral, social and political issues written by legal experts, in plain English. We hope our readers will enjoy them ! ❐

S.C. Roy