'Inadequate' intellectual property protection in India

In recent years, the economics fraternity advising policy has had a significant influence on the rate and direction of the 'take-up' of domestic innovation—sourced from the scientific community—in our industrial economy. A significant segment of this fraternity has held up East 'Tiger' Asia as our model. That segment has also publicly contended that 'piracy' born of 'inadequate intellectual property protection' in India has hindered foreign investment inflows. Some sections of the scientific community have echoed this contention.

Throughout the sixties and seventies Japan heavily 'pirated' foreign intellectual property—whether or not formally protected in Japan under (the then) Japanese laws. The expression 'Japanese copy' has its origins in these practices. Some of these practices continue in Japan and have been the cause of trade-related friction between the US and Japan since the late eighties.

For quite a while East Asia has been advised by a variety of international economic pundits and investment institutions to emulate Japanese policies for industrial development. That East Asia has done so in the period 1988–1992 with startling success in the realm of pirating intellectual property is revealed by a Japanese Ministry of International Trade and Industry (MITI) survey. Despite these practices in East Asia, the inflow of foreign, including Japanese, investment into that region has been (enviously) quoted by the economics fraternity.

Japan's MITI conducts each year a rolling survey on 'Imitations related to the creation of design, trademark and technologies or writings' for a previous fiducial five-year period. This survey is

Table 1. Number of imitations by manufacturing country

	1988		1989		1990		1991		1992	
Country	Number of cases	Ratio (%)	Number of cases	Ratio (%)	Number of cases	Ratio (%)	Number of cases	Ratio (%)	Number of cases	Ratio (%)
Taiwan	269	38.9	177	36.0	141	30.1	217	33.5	167	25.1
China	35	5.1	18	3.7	44	9.4	69	10.7	108	16.2
South Korea	152	22.0	69	14.0	87	18.6	97	15.0	85	12.8
Hong Kong	54	7.8	35	7.1	54	11.5	45	6.9	52	7.8
Thailand	36	5.2	28	5.7	22	4.7	33	5.1	30	4.5
USA	11	1.6	4	0.8	1	0.2	24	3.7	17	2.6
EC	25	3.6	17	3.5	16	3.4	23	3.6	16	2.4
Singapore	14	2.0	14	2.8	9	1.9	9	1.4	16	2.4
Malaysia	11	1.6	10	2.0	9	1.9	9	1.4	14	2.1
Indonesia	37	5.3	14	2.8	18	3.8	21	3.2	13	2.0
India	4	0.6	4	0.8	6	1.3	8	1.2	10	1.5
Philippines	11	1.6	1	0.2	1	0.2	3	0.5	6	0.9
Japan	16	2.3	21	4.3	20	4.3	23	3.6	74	11.1
Total*	692		492		469		647		666	

*Total number in the whole world including unidentified countries.

Table 2. Number of imitations by distributing country

	1988		1989		1990		1991		1992	
Country	Number of cases	Ratio (%)	Number of cases	Ratio (%)	Number of cases	Ratio (%)	Number of cases	Ratio (%)	Number of cases	Ratio (%)
Europe	138	11.1	86	12.0	176	17.6	240	17.2	309	22.4
Taiwan	142	11.5	120	16.7	103	10.3	158	11.3	119	8.6
Hong Kong	87	7.0	46	6.4	66	6.6	75	5.4	105	7.6
China	18	1.5	23	3.2	41	4.1	82	5.9	92	6.7
USA	117	9.4	46	6.4	43	4.3	78	5.6	77	5.6
South Korea	49	4.0	51	7.1	81	8.1	97	7.0	75	5.4
Thailand	36	2.9	28	3.9	46	4.6	55	3.9	49	3.6
Indonesia	54	4.4	37	5.2	40	4.0	64	4.6	47	6.4
Malaysia	19	1.5	26	3.6	42	4.2	48	3.4	36	2.6
Singapore	23	1.9	37	5.2	31	3.1	64	4.6	35	2.5
Philippines	22	1.8	6	0.8	34	3.4	30	2.2	21	1.5
India	6	0.5	6	0.8	19	1.9	8	0.6	21	1.5
Japan	170	13.7	67	9.3	51	5.1	58	4.2	125	9.1
Total*	1,239		717		1,001		1,394		1,380	

*Total number in the whole world including unidentified countries.

published every year by the Inspection and Design Administration Office, International Trade Administration Bureau, MITI, based on a domestic Japanese questionnaire.

Results culled from the survey for the period 1988–1992 are presented in Tables 1 and 2. These reveal:

(a) The top four pirates of Japanese intellectual property in *manufacturing* in the 'Tiger' countries are Taiwan, China (PRC), South Korea and Hong Kong, in that order.
(b) USA and the European Community follow at places six and seven. (Tea calling the pot black?)
(c) India has an exemplary record of respecting Japanese intellectual property. India's record is better than even Japan's own (self-imitation) record—old habits die hard!
(d) Europe is the worst culprit in *distributing* pirated Japanese goods. Japan itself is often the second-worst. *India has the best record.*

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Plant Reproduction '96 (14th International Congress of Sexual Plant Reproduction) Lorne, Australia – Congress report

There has been an increasing interest during the last 10–15 years in studies on reproductive biology, particularly of seed plants. This is largely due to the realization of the importance of such studies for understanding the evolution of the species, to develop effective conservation strategies and to exploit full economic potential of plant resources. There has been an explosion of papers published in this area and many international meetings have been held in recent years on various facets of reproductive biology. Pollination biology, an important area of reproductive biology, was the theme of an International symposium held at Bangalore during August 1993 and *Current Science* brought out a special issue on this theme (vol. 65, No. 3, 10 August 1993).

Plant reproduction '96 was held from February 18 to 23, 1996 at the Cumberland resort at Lorne, a popular beach resort, situated 150 km from Melbourne, Australia. The Congress was organized by Prof. R. B. Knox and his associates (Univ. of Melbourne) under the auspices of the International Association of Sexual Plant Reproduction Research (IASPRR). The following are the highlights of the major themes of the Congress.

A large number of papers were devoted to the molecular aspects of flower initiation and development. Studies carried out during the last 10 years have shown that flower induction and differentiation of floral whorls require a highly regulated expression of a large number of organ/cell-specific genes. Pollen development itself is reported to involve the expression of over 20,000 genes. A majority of papers covered characterization of many of these specific genes, their regulatory elements and their possible function deduced through analysis of mutants or through antisense approach to perturb the function of the gene in transgenic plants or through amino acid sequence similarity to known proteins. Of special interest are the reports of genes which are specifically expressed in the vegetative cell, the generative cell and the sperm cells of the pollen. Asymmetric division of the microspore seems to play an important role in differential expression of genes in the resulting vegetative and generative cells. Such studies being carried out in a number of laboratories are building up our understanding of the development of flower in general and of pollen in particular, which is essential for the effective manipulation of floral events.

There were several papers on various aspects of pollen tube growth. Since long, Ca^{2+} has been implicated in a variety of pollen tube responses. Malho (Univ. of Lisbon, Portugal) presented the results of his elegant experiments on photoactivation of caged Ca^{2+} through a short UV pulse. Increasing the Ca^{2+} concentration on one side of the pollen tube apex resulted in a change in the direction of tube growth towards high Ca^{2+} concentration. The special award of bronze medal for the best paper by a young investigator was given to Malho. The award for the best poster by a young investigator went to Li, of the University of Melbourne, Australia, for her poster on regulation and purification of callose synthase of the pollen tube.

Pollen–pistil interaction is a dynamic process during which pollen is either permitted to complete post-pollination events or is inhibited from reaching the ovule. This interaction is mediated through extracellular matrix (ECM) present in the transmitting tract of the pistil through which the pollen tubes grow. Many of the papers were concerned with the characterization of pistil-specific genes, and the components present in the ECM. Transgenic plants in which cells/tissues of the stigma are genetically ablated by the targetted expression of the diphtheria toxin have been used to study the role of some of the components required for pollen adhesion, germination and pollen tube entry. The results on *Brassica* (Nasrallah, USA) as well as on tobacco (Mariani, The Netherlands) clearly showed that the lipids present on stigma surface are essential for the normal functioning of pollen. Evidences were presented for the role of proteinase inhi-