

January 1990

Dependencia Theory and Innovation in Mexico: The Dissolution of Property in Inventive Ideas

George M. Armstrong Jr.

Follow this and additional works at: <https://digitalcommons.du.edu/djilp>

Recommended Citation

George M. Armstrong, Dependencia Theory and Innovation in Mexico: The Dissolution of Property in Inventive Ideas, 19 Denv. J. Int'l L. & Pol'y 115 (1990).

This Article is brought to you for free and open access by the University of Denver Sturm College of Law at Digital Commons @ DU. It has been accepted for inclusion in Denver Journal of International Law & Policy by an authorized editor of Digital Commons @ DU. For more information, please contact jennifer.cox@du.edu, dig-commons@du.edu.

Dependencia Theory and Innovation in Mexico: The Dissolution of Property in Inventive Ideas

Keywords

Copyright, Industrial and Intellectual Property, Trademarks, Technology, Communications Law, Economics

SPECIAL TOPIC—CURRENT LEGAL ISSUES IN LATIN AMERICA

Dependencia Theory and Innovation in Mexico: The Dissolution of Property in Inventive Ideas

GEORGE M. ARMSTRONG, JR.*

This study of economic and legal development in Mexico examines intellectual property and the right to exclude others from inventive ideas. There are several reasons for examining the relation between the market and law in this context. First, patent law is an important piece of Mexico's policy on technology and this policy has been the subject of robust debate in the press and in Congress since the early 1970s. Statesmen, scientists and academicians have sharply disagreed on the causes of their nation's underdevelopment and have advanced various prescriptions. The government adopted one theory from among those presented in these debates, the concept of third world development known as dependencia, and fashioned legislation upon its premises. The opposing theory which attributed Mexico's underdevelopment to indigenous cultural and political factors, such as weak incentives to innovate and limitations on competition, have had little influence on policy.

Second, dependencia theory is a critique of market exchange from the perspective of distributive justice, explaining shortcomings in the domestic economy of a host country through the influence of market power. Dependencia theory hypothesized that multinational corporations impeded innovation in Mexico by employing patents to monopolize technol-

* George M. Armstrong, Jr., Professor of Law, Louisiana State University, Paul M. Hebert Law Center. After a protracted battle with a fatal disease, Professor Armstrong passed away on September 8, 1990. Professor Armstrong was an initiator whose ideas ranged from a new course in Transactions in Industrial Property to dramatic enhancements in the Civil Law Program at Louisiana State University. Professor Armstrong was described by the University of Louisiana as "a brilliant scholar, an excellent and dedicated teacher, and a good friend to all who knew him." Professor Armstrong's outstanding contributions to legal scholarship will definitely be missed.

ogy and through one-sided licensing agreements. In the 1970s, the government of Mexico followed the prescription of this theory, revised the patent laws and established administrative controls over the international transfer of technology. However, these reforms were empty promises. The anticipated flowering of innovation has not occurred.

The final reason for analyzing the relationship between law and the means of distribution in the context of intellectual property is the most significant. The failure of the dependencia theory to explain underdevelopment and the inability of these new laws and institutions to stimulate innovation tend to confirm that the obstacles to development are domestic. The impediment to innovation is not distortion of the market by the excessive power of some participants, it is the minimal importance of the market as a device for distributing property.

THE DEVELOPMENT OF THE MEXICAN ECONOMIC SYSTEM

In Mexico, compulsion in various forms overshadows the market as the mechanism which allocates the factors of production. Factors of production and objects of enjoyment are values. Some values are objects of commerce. Others, such as virginity are not. Values which are in commerce are commodities. One of the characteristics of commodities is the capacity of a person who has rights in them to protect them from trespass. Market society creates property, rights of exclusive use, by separating attributes of the individual from the individual or by privatizing attributes of the community, by reifying those attributes and transforming them into "things." The legal system of a market society gradually standardizes the procedures for recognizing, defending and alienating those rights. The process of commodification has created property from individuals' names and likeness, authorship, invention, labor and land. At one time or another, the dominant philosophy of the day has maintained that each of these articles was an inalienable attribute of the individual or community. Today, they are commodities. The right to alienate them and exclude others from them are protected by law.

In Mexico, this process has been retarded and commodification has not functioned in the same fashion as in societies in which the market is more significant. The communitarian land-owning practices of sixteenth century Spain complemented the traditions of the Indians. When land did become subject to private ownership, it was rarely an object of commerce for it ordinarily belonged to the church or an entailed *hacienda*. Compulsion was more important than contract as a device for organizing labor until the twentieth century. A succession of unfree devices such as *encomienda* (entrusting of Indians to colonists), *ganane* (obligations based on birth place) and debt peonage tied *campesinos* to *haciendas*. Production for family subsistence exceeded purchase of food stuffs. Participation in market exchange has developed more slowly for Mexicans than for persons in some other societies. Consequently, they are less accustomed to thinking of themselves as traders and the factors of production than as commodities.

Mexico has also imported many norms of property and contract law which its society did not demand and its social conditions could not maintain. Disamortization of village lands in the 1850s contradicted the communal tendencies of the Indians. The civil code of 1870, imported from France, presupposed the existence of a society of traders, and the abolition of forced heirship a decade later granted Mexicans a degree of autonomy in disposing of their property which they had not sought. In this century, the government's plan to organize agriculture along collective lines was borrowed from Soviet socialism. In the 1940s, Mexico adopted a system of patent law which presupposed the presence of an inventive culture and of industry avidly engaged in innovation, in short, a supply of and demand for invention; neither of which existed. These imported rules for recognizing and defending the right to exclude others from inventive ideas did not encourage science by protecting its fruits. Yet those who anathemized the patent system were also in error, for the removal of the fences which protected the pastures of high technology in the 1970s did not cause a stampede of trespassers bound to take advantage of others' creative efforts. Mexico's patent laws are probably irrelevant, at least to domestic inventors. They do not encourage or protect invention because the dearth of competition stifles the incentive to innovate. There is no need to protect technology from trespass in a society which lacks the infrastructure to use it.

Social scientists in Mexico and other developing countries criticized patent laws and blamed the market power of patent owners for a variety of the ailments of the developing world. One author's list of five dysfunctional consequences of patent legislation was typical of the genre.¹ Firms from highly industrialized countries employ patents, he said, to perpetuate monopoly conditions, to avoid the development of substitute technical processes, to discourage new foreign investment in developing countries by protecting monopolistic markets, to acquire control of weak firms in those same nations by restricting the supply of technology, and to encourage the transfer of obsolete or inappropriate technology to the third world. In support of these conclusions, analysts produced statistics which showed that ninety-two percent (92%) of all patents registered in Mexico belonged to foreigners.² In the developing world as a whole, the figure was said to be five-sixths. The percentage of patented inventions which were never put into production may have been as large as ninety-five percent (95%).³

The intention of the foreign inventors who acquired these patents was probably to block competition with other firms from the advanced countries, not to control the domestic economies of developing nations.

1. Arango, *Tecnología y Dependencia*, 40 EL TRIMESTRE ECONOMICO 384 (1973).

2. Gribmont & Rimez, *La Política Económica Del Gobierno de Luis Echeverría*, 44 EL TRIMESTRE ECONOMICO 825 (1977).

3. J. SOBERANIS, *LA REGULACION DE LAS INVENCIONES Y MARCAS Y DE LA TRANSFERENCIA TECNOLÓGICA* 50 (1979).

Because the monopoly which a patent confers is only nationwide, an inventor who wishes to block competitors from adopting an invention must obtain patents in numerous countries. Nonetheless, many nationalists concluded that "the system of industrial property appears clearly as an indispensable mechanism for reproduction and extension of technological dependency."⁴ Foreign patent owners would only license their technology to Mexican companies, according to this line of argument, in return for "super prices" and in concert with "restrictive commercial practices which are included in the licensing contracts."⁵

Mexico's technological dependency did not become a subject of debate until the 1960s. In 1958 a governmental commission presented a draft law on foreign investments.⁶ The bill, which was never adopted, would have required government approval of all direct, foreign investment. There were no provisions in the bill for regulation of technology of foreign origin. The absence of regulation of foreign investment and technology licenses prior to this date was not accidental. Official spokesmen had often rejected suggestions to regulate these areas, alluding to the complexity of the international economy and the importance of flexibility in international negotiations.⁷

In the years between the Second World War and the Echeverría presidency, Mexico's policy was to welcome foreign investment and substitute manufactured goods of domestic origin for imports.⁸ The government protected these foreign investors, as it shielded its native capitalists, with protective tariffs, setting import duties at the rate which industry suggested. According to one observer, "The basic principle of orientation is to fix a tariff which guarantees the market for the national product."⁹ Tax exemptions and direct subsidies sweetened the rewards for investors. The government did not discriminate against businesses owned by foreigners.

Foreign technology and capital, protected by high tariffs, brought an economic boom to Mexico in those years; but even before the election of Echeverría in 1970 and the ascendancy of third world nationalism in the wake of the Arab oil embargo in 1973, various interests were encouraging the government to restrict foreign investment in the national interest. One author wrote that the need for legal regulation of foreign capital was "unpostponable."¹⁰ Michael Wionczek, Mexico's foremost authority on technology policy, has written that scientists began to express doubts in

4. Gribmont & Rimez, *supra* note 2, at 826.

5. J. SOBERANIS, *supra* note 3.

6. Proyecto de Ley Sobre Inversiones Extranjeras Directas en Mexico, in *EL REGIMEN JURIDICO DE LAS INVERSIONES EXTRANJERAS EN MEXICO* (R. Silva ed. 1969).

7. *Id.* at 18-19.

8. CONSEJO NACIONAL DE CIENCIA Y TECNOLOGIA, POLITICA NACIONAL DE CIENCIA Y TECNOLOGIA: ESTRATEGIA, LINEAMIENTOS Y METAS 8 (1976).

9. I. D. IBARRA, *EL PERFIL DE MEXICO EN 1980* 163 (1972).

10. R. Silva, *supra* note 6, at 143.

the 1960s about their country's reliance on foreign technology and to criticize the absence of the basic conditions for domestic research. Owners of small and intermediate industry came to believe that technology of domestic origin might protect them from foreign competition. "In the debate which arose, it was observed that nearly all of the technical processes and designs of the country's industrial plants came from other countries at a cost which all would agree is high. It was perceived that national scientific activity was developing painfully in an environment of extreme economic and institutional limitations."¹¹

In 1970, the government responded to these problems by creating a commission, the National Council of Science and Technology.¹² The Council's mission was to advise and assist the federal executive in establishing, executing, and evaluating national policy. Although a significant body of opinion already maintained that Mexico's technological shortcomings were a result of the actions of transnational corporations, the government did not initiate any regulatory measures at this time. The focus of the council's activity was to encourage domestic research, but in early 1972 the council announced that the plight of Mexico's weak technological infrastructure of research was aggravated by "the indiscriminate importation of technology."¹³ According to the council's figures, only 3,665 technicians were engaged in research in the entire nation. "It is estimated that the total expenditures for innovation represent only 0.3% of the GNP." To remedy the "displacement" of domestic scientists, the report stated, the government must develop a comprehensive policy on the transfer of technology.

The Council's statement emphasized that the activity of transnational corporations and the absence of domestic support for science mutually aggravated Mexico's technological dependence. Its prescription was a policy on international technology transfer "in coordination with policies on industry, finance and balance of payments, closely linked to the reform of national education." Some readers ignored the aspects of the diagnosis which criticized the domestic infrastructure, electing to read the report solely as an indictment of American domination. An editorial in the country's preeminent newspaper declared that the Council had unmasked that insidious "imperialism which employs technology to dominate" other nations.¹⁴ The editorial distorted the council's report, claiming that the document lay no blame on Mexican culture and education. Purporting to summarize the report, the writer stated, "It is a problem of independence which affects the total socio-economic and moral life of the country." The editorial concluded by decrying the ideological "mystification of Mexican life" which falsely preaches "that national interests can

11. M. WIONCZEK, *LA TRANSFERENCIA INTERNACIONAL DE TECNOLOGIA - EL CASO DE MEXICO* 9 (1974).

12. *Diario Oficial* (Dec. 29, 1970).

13. *Excelsior* (Jan. 10, 1972).

14. *Narvaz*, *Excelsior* (Jan. 14, 1972).

coexist with foreign objectives on the plane of profit."

THE GROWTH OF THE DEPENDENCIA THEORY IN MEXICO

The National Council of Science and Technology provided ammunition for the proponents of dependencia theory, a social philosophy which offered to explain the failure of third world economies to follow the American and Western European path of development. The dependencia theory was the principle response of the Latin American intelligencia to Walt Rostow's theory of stages of economic growth.¹⁵ It enjoyed wide appeal throughout the region, gaining adherents in every major country and providing a rationale for a tidal wave of protectionist legislation. The dependencia theory held sway for nearly a decade on account of a confluence of factors. Its emergence coincided with a renaissance of nationalist sentiment and third world solidarity financed by the rising price of oil. This theory of development permitted national leaders to blame the plight of their nations on external causes and to avoid adopting painful domestic reform. Mobilizing their large majorities in the United Nations, the third world's "Group of 77" nearly established the legal basis for significant claims to redistribute the world's wealth in the mid-1970s.

The claims of dependencia are best stated by some of its leading proponents. The theory "tries to explain the historical genesis and evolution of the social structures of our countries and of the special link to the hegemonic powers."¹⁶ Its advocates hypothesize the existence of an asymmetrical relationship between two nations, in which the hegemonic power perpetuates its influence by alliances with one or more groups in the peripheral society. Through these relationships, the hegemonic power "conditions" the development of the third world country, so that the interests of transnational corporations predominate over domestic interests in forming national policy. "What characterizes this new international economy is the control, by groups located in the dominant subsystems, of the diffusion of new technology . . . [A]ccess to these new technologies is a necessary condition for development . . ."¹⁷ Transnational enterprises, which control the flow of technology to their third world subsidiaries "participate increasingly in the economic activities of the dependent subsystems." Accepting foreign capital and technology uncritically, Latin American states have sacrificed "the autonomy of the national economic system."¹⁸

15. See generally W. ROSTOW, *THE STAGES OF ECONOMIC GROWTH: A NON-COMMUNIST MANIFESTO* (1960).

16. Krieger, *La Dependencia Como Contexto Macrosocial de la Política Científico - Tecnológica*, in *AUTONOMIA NACIONAL O DEPENDENCIA: LA POLÍTICA CIENTÍFICO - TECNOLÓGICA*, at 117 (F. Suarez ed. 1975).

17. Furtado, *Dependencia Externa y Teoría Económica*, *EL TRIMESTRE ECONÓMICO* 335-336 (1971).

18. F. CARDOSO & E. FALETTO, *DEPENDENCY AND DEVELOPMENT IN LATIN AMERICA* 162 (1971).

Through their dominant positions in a developing country, multinational corporations effectively make the nation's technology policy. The absence of regulation is their ally. First, the home office of the transnational enterprise exercises direct influence over the technology selection of its subsidiary.¹⁹ Second, firms in developing countries which act as sub-contractors and suppliers of these subsidiaries must conform the specifications of their products to the demands of the contractor, employing, as a rule, imported technology to meet these requirements. Third, local firms which have no direct ties with the international cycle of production generally have "a special predilection for that which is of foreign origin" and will select this technology on grounds of sound investment or the appeal to consumers of foreign trade names. Even the governments of third world nations prefer imported technology to domestic research and development when they purchase weapons systems.

CAUSALITY BETWEEN MEXICO'S PROBLEMS AND THE DEPENDENCIA THEORY

During the 1970s, newspapers and scholars produced many studies to reveal the extent of foreign ownership of the means of production and the role of imported technology in the Mexican economy.²⁰ For the purposes of this essay, the accuracy of these figures is secondary in importance to the perception of dependence upon foreign know-how which the studies created. Even if the conclusion of dependence on foreign technology is correct, the remedy of regulation was not self-evident. Absent from these reports was any analysis of causation. Had foreign technology displaced domestic research or only filled a gap created by its absence? Was the international market the culprit, or was it Mexico's culture?

According to various studies, the entire region of Latin America maintained a commercial balance of payments deficit in favor of "first world" countries. In 1976, the region remitted seven billion dollars in profits and interest which was in excess of the amount of capital invested from abroad.²¹ Mexico's balance of payments deficit was 350 million dollars for the year. Sixty percent (60%) of Mexico's exports were destined for the United States and eighty-nine percent (89%) of its imports were of U.S. origin.²² Seventy percent (70%) of the country's foreign tourists were U.S. nationals. Foreign capital also occupied a crucial position in the domestic economy. Only two of the nine automobile manufacturers had a majority of their shares in Mexican hands in 1974.²³ Furthermore, foreign capital was concentrated in the most technologically sophisticated areas of the economy, affording its owners influence over the course of develop-

19. Amadeo, *La Dependencia Economica y Su Relacion con la Dependencia Tecnologica*, in Suarez *supra* note 16, at 138-141.

20. See, e.g., Garcia, *Industrialization y Dependencia en la America Latina*, EL TRIMESTRE ECONOMICO 731 (1971).

21. Excelsior (Jan. 5, 1977).

22. Excelsior, at 15 (Feb. 1, 1977).

23. M. WIONCZEK, *supra* note 11, at 85.

ment beyond the dollar value of their investments.

One study indicated that capital intensive industries purchased most of their equipment abroad. Favorable credit terms encouraged firms in the petrochemical industry to purchase seventy to eighty-five percent of their machinery from foreign suppliers. The study found that "close relations were established with the suppliers after the installation of the new equipment in a majority of the plants."²⁴ Only three of the nineteen firms which were objects of the study had purchased used equipment. There was also some evidence that the cost of imported equipment and technology was inversely related to the extent of foreign ownership in the purchasing firm. An examination of contracts between transnational companies and their wholly-owned Mexican subsidiaries in the auto parts industry disclosed that agreements to license technology often contained no provision for compensation at all.

An alternative explanation for the absence of any express term on price in these technology licenses maintains that foreign corporations receive compensation for know-how in the form of repatriated dividends. In fact, some analysts claim that transnational corporations arrange their relations with third world subsidiaries with the intention of obscuring the cost of imported machinery and technology, hiding the price for such transfers in shareholders' dividends. In other cases the foreign firm obtains its profit by raising the price of raw materials which it supplies. The pharmaceutical industry, for example, often purchases ingredients abroad for assembly in Mexico. One study of this industry disclosed that foreign corporations charged their Mexican subsidiaries prices for component parts which ranged from a hundred to a thousand percent above the international average.²⁵

"Prestige" is often the explanation which third world corporations provide for purchasing foreign technology, trademarks, and brand names. Executives at four pharmaceutical companies responded to a survey by stating that foreign licenses of technology were essential to their operations, but they would continue to use those patents and trademarks because of their recognized value in the Mexican market even if domestic substitutes were available. This factor, in combination with the influence of foreign ownership of the domestic means of production, the policy of producing for export, the dynamics of the international credit market, and many other considerations, influence the selection of technology by Mexican manufacturers. In several cases industrialists have simply replicated on Mexican soil the complete design of a factory at the main office of the transnational firm without first considering whether the scale of the market or the availability of resources justified that decision. More frequently, the transnational company modifies the design of its existing facilities to harmonize with Mexican conditions. Of four pharmaceutical

24. *Id.* at 145.

25. *Id.* at 193.

firms which responded to one survey, half described their plant as a combination of foreign and domestic technology. The remainder stated that they employed imported technology. One author concludes that, "[i]n many enterprises, especially automobile industries, the plant installed in Mexico is indistinguishable from those abroad, except in the scale of operation and the use of second-hand, obsolete machinery."²⁶

Numerous newspaper articles drew attention to the respects in which the activity of transnational companies allegedly deformed the Mexican economy. Writing in the periodical *Excelsior*, an economist from the National Autonomous University observed that Mexico was the first place chosen by foreign firms to send obsolete equipment. The local branch office usually has no choice but to accept the machinery. "[T]he transnationals have preferred to obtain additional profits without any productive activity, becoming instead providers of technology."²⁷ They contribute to the bankruptcy of small and intermediate firms by engaging them as subcontractors, then casting them aside when the needs of the transnational outstrip the capacity of the firm. Advertising and sale of products in the third world, which originate in industrial nations also distort patterns of consumption, creating a demand for soft drinks and candy bars when there is inadequate potable water and meat.

An opinion article in the same newspaper spoke of the "profound deformation" in the industrial sector which "premature acceleration in the concentration and monopolization of capital" brought about.²⁸ Because foreign investment tends to concentrate in heavy industry and large scale manufacture, Mexico has an abundance of such enterprises but few, well-mechanized small shops. The country's skilled labor force is unevenly distributed among different sectors of the economy so that traditional and primitive patterns of production exist alongside ultra-modern techniques.

THE PRIVATE SECTOR'S RESPONSE

In the spring of 1975 representatives of private business who engaged in international transactions, announced the formation of a committee whose task was to present the viewpoint of their much maligned constituency. Newspaper accounts of the activities of this committee, and of the vociferous and angry reaction of other sectors of society to its mission, offer a revealing photograph of the ideological landscape at the moment of high tide of the dependencia theory near the end of the Echeverría presidency. On March 8, the president of Coparmex announced the creation of a coordinating committee of private enterprise.²⁹ Criticizing social theorists who oppose foreign investment, the spokesman stated that the

26. *Id.* at 209.

27. *Excelsior* (Jan. 22, 1977).

28. *Excelsior* (May 5, 1975).

29. *Excelsior* (Mar. 10, 1975).

influence of transnational firms was not significant, amounting, he said, to only five percent of the nation's capital, "a very small percentage, which could not be called colonialism or serious dependency." He also urged the legitimacy of a national organization of capitalists, similar to the officially sanctioned unions of urban and rural labor. *Excelsior's* editorial writers responded moderately to these proposals at first, observing that the bulk of the nation's economic might was still in private hands and that the class of capitalists had legitimate interests. Concluding that business should be neither "satanized" nor "angelized," the editorial urged readers to appreciate its proper role.

After a space of two months, the coordinating committee of businesses released its statement of principles, exposing its fundamental disagreements with the ideological currents of the country and setting the stage for confrontation. The businessmen asserted that "the human being has a natural, primary and inviolable right to satisfy his needs and reach his objectives through private property and the reasonable use of material wealth."³⁰ Private enterprise is "the basic cell of the economy, a most peculiar and valuable manifestation of the creative capacity of man and an expression of the spiritual wealth of those who contribute to realize, sustain and improve it In a democratic society economic activity is a matter for individual activity."

The natural law basis of this platform was not remarkable in itself. Principles of a higher law have long been the touchstone of Mexican advocates of social justice. However, in this century, references to natural rights have justified state regulation of economic activity, not autonomy and egoism. Natural law limits rights in property in contemporary Mexico. Even the liberal reformers of the 1850s who stripped the church and Indian villages of their lands to transform them into articles of commerce preferred to reason from "self-evident economic axioms" which they attributed to Adam Smith than from principles of justice. Furthermore, to urge that the proper role of the state is merely "to create the appropriate conditions for individual achievement" is to challenge the country's deepest traditions of paternalism.

The platform of the business roundtable encouraged an approach to foreign investment which was pragmatic, not hostile. Where Mexican capital is insufficient, the government should permit foreign investors to acquire majority ownership in domestic concerns, particularly if the industry is vital to the national welfare. This plank implicitly encouraged the repeal of a 1973 statute on foreign investment which confined foreign shareholders to minority ownership of firms in many industrial sectors.

Representatives of the government responded quickly to the coordinating committee. Two days after the publication of the platform, a senior minister in the Echeverria administration castigated the forces of reaction which, he said, contained "elements of resistance to change,"

30. *Excelsior* (May 8, 1975).

representing "a retrogressive attitude toward the progress of the mixed economy."³¹ These businessmen fail to recognize that in Mexico the social order "is based on the predominance of the interests of the majority over the interests of individuals." The minister darkly accused the group of threatening the "structure and spirit of the Mexican Constitution" and of subverting third world solidarity.

The protagonists in this debate were neither a fringe of society nor a splinter group of industry. The coordinating committee included among its members the Confederation of Chambers of Commerce, the Association of Mexican Bankers, and the Mexican Association of Insurance Companies. Their statement of principles presented a serious challenge, on the level of ideology if not on the plane of electoral politics, to the policies of the government. The importance of their membership also explains the caliber of the response.

In the days following, *Excelsior* contained numerous editorials criticizing the platform of the Coordinating Committee. A statement published on May 12, 1975, struck at the natural right foundation of the statement of principles. "It is obvious that the natural right of property . . . has as its purpose the maintenance of monopoly in property." The "vocation of private property is consumption" not accumulation, the writer continued and "all people, without exception have the right to possess the means of feeding and clothing themselves." This editorial, like most others of the same genre, did not bother to explore the basis of these rights.

THE POLITICAL RESPONSE

The response rose to the level of invective a few days later when Lopez Portillo, the man who would become the next President of Mexico, informed the business community that they were "not more than one step from Nazi-fascism."³² Nationalization of the means of production was an historical process from which there could be no retreat. The leaders of business were striving to place their own interests ahead of the community.

Dependencia theory was diagnostic. Its proponents offered to explain the failure of the third world to follow the pattern of economic development of industrialized countries. Although members of this school of thought disagreed on specifics, the fundamental explanation was the same for each. When western Europe and the United States were building their industrial economies in the nineteenth century, there were no nations on earth more highly developed; but the economy of Latin America has continually been subjected to the penetration of international capitalism. Foreign capital and technology have "conditioned" the type of industries constructed and their scale as well as the products which they produce

31. *Excelsior* (May 10, 1975).

32. *Excelsior* (May 17, 1975).

and consumer tastes.

On the foundation of this diagnosis, political leaders sympathetic to the theory propounded a prescription. All relevant shades of political thought conceded that technology and capital were necessary for continued development and that Latin America had a deficit in both. The prescription was to continue admitting these resources into their countries and establish regulatory controls. Such controls would consist of restrictions on the types of property and business which foreigners might own, limits on freedom of contract between foreign and domestic firms, and limitations of the right of transnational firms to exclude others from their know-how and patented technology.

Efforts to implement this prescription flourished in the 1970s. Developing nations formed the Group of 77 and proposed international codes of corporate conduct to the U.N. Commission on Trade and Development. The General Assembly called for international redistribution of wealth and discussed the economic rights and duties of states. Regional arrangements such as the Andean Pact lay the foundation for national legislation to control foreign investment. The Arab oil embargo and the election of Salvador Allende in Chile opened new vistas of opportunity, offering simultaneous third world control over natural resources as a fulcrum and vigorous, independent leaders as a lever against the developed countries. The optimism of the era, the conviction that Latin nations were about to take control of their destinies, was manifest in the speeches of Echeverría and others.

In his message to Congress, accompanying a bill to regulate foreign investment, Echeverría declared, "contemporary norms of international law repudiate any form of exploitation of weak countries."³³ Foreign capital must play a "complementary role and should inevitably be subordinate to the policies of the recipient countries." International investment is no longer "exclusively a concern of those countries in which it originates" and it must adjust itself to the interests and purposes of the host nation. The President's address coincided with a state visit by the Chilean leader Salvador Allende, a confluence of events which propelled the "representatives of imperialism" into a paroxysm of despair, at least to one observer. A letter to the editor of *Excelsior* noted that these "representatives" had denounced the Mexican initiative and Allende's recent address to the U.N. as a "common front" against the interests of business.³⁴ The introduction of the bill on foreign investment also coincided with the American offensive against North Vietnam during the Christmas of 1972. These events did not seem at all coincidental to the letter writer who remarked, "[t]his is the form in which Mr. Nixon's bombers reverberate in Mexico and in the other third world countries which attempt to get out of underdevelopment."

33. *Excelsior* (Dec. 27, 1972).

34. *Id.*

The Law to Promote Mexican Investment and to Regulate Foreign Investment³⁵ reserved certain business activities to the government or corporations wholly owned by nationals. These included radio and television, urban and interurban transport, air and maritime transport, exploitation of woodlands, and distribution of natural gas. The law forbade the granting of mining concessions to foreigners and restricted transnational ownership to minority positions in any company processing petrochemicals or manufacturing auto parts. Any foreigner who wished to acquire real estate, purchase bearer shares of stock or organize a business was required to solicit the authorization of the National Commission of Foreign Investment. This body authorizes participation in or control of domestic companies by international interests, taking care that such investment complements, without displacing, local initiative.

Simultaneously, the administration of President Echeverría prepared a bill to regulate purchases of foreign technology. The objectives of the bill were to insure that corporations did not import technology which was already available in Mexico, to avoid burdens on the balance of payments and to limit extraterritorial control of domestic business. PAN and the socialists, the principal opposition parties of the right and left, supported the bill, but the leader of each delegation remarked in the course of floor debates that Mexico must also stimulate its own scientific capacity.³⁶ Speakers from both parties also peppered their remarks with lamentations on recurring strikes and unrest at the National Autonomous University, an oblique critique of Mexico's culture of scholarship and innovation.

The socialist leader Ortiz Mendoza excoriated, "North American imperialism . . . the fundamental enemy of development in our country;" but he also noted that protection from foreign influence is a defensive measure. The encouragement of indigenous know-how is the *sine qua non* of development. The PAN spokesman agreed, but added that Mexico should not "arbitrarily close the doors to foreign collaboration." He admonished the newly created National Registry of Technology Transfer to "take care" lest "regulation constrict national development."

The Undersecretary of Industry in the Echeverría administration provided the government's response to this admonition in an essay which he published soon thereafter. Under the title "Yes, The Rules of the Game Are Being Changed," Jose Camillo Sainz explained that Mexico had commenced to regulate transfers of technology "because we need an economy placed, not at the service of material goods, but at the service of human beings."³⁷ Adopting the defiant tone typical of third world nationalism in the mid-1970s, he added, "[w]e are certain that the companies which have been working with Mexican firms will understand [the need

35. Diario Oficial (9 Mar. 1973).

36. Excelsior (Dec. 20, 1972).

37. Comercio Exterior (Nov. 11, 1972).

for regulation] But even if our action were objected to by some . . . we feel we will be able to find what we want in other parts of the world." Actually, some aspects of the law on technology transfer merely incorporated into Mexican practice well established principles of American anti-trust law. The law prohibited tying arrangements, contractual clauses which required Mexican firms to deal exclusively with any particular foreign corporation or to purchase one service or commodity as a pre-condition for purchasing another. However, the heart of the law, the provision which removed technology licenses from the domain of private contract to the field of public administration, was the clause requiring parties to each agreement to obtain approval of a governmental agency under pain of nullity of the deal.

THE MEXICAN PATENT LAWS

The National Registry of Technology Transfer³⁸ has authority to deny approval to any license which damages the national interest. The statutory criteria for evaluating injury are vague. Licenses are injurious if the technology which is the object of the contract is already available in Mexico, if the compensation is unreasonable, or if the duration of the agreement is excessive. By declaring international technology licenses to be subject to the public interest, the government has diminished the security of agreements and limited the conditions under which the owner may exclude others. Subjective criteria such as the fairness of price and reasonableness of the duration of a license become marginally more reliable if the Registry adheres to the statute and employs experts to assist its deliberations. The foundation of the law is a notion of objectively ascertainable fair value for know-how which exists independently of the process of bargaining between the parties. This notion has a respected lineage in Mexico. The innovative aspect of the statute is the application of this concept to such a unique and ephemeral commodity as know-how.

Mexican and Spanish colonial law have contained many limitations on the capacity of contracting parties to bargain on the price of commodities. Colonial cities held monopolies on the sale of grain and meat and controlled their prices. Individuals who purchased or sold land at a price which departed from "fair value" could cancel the contract under laws in force until 1870. Purchasing necessities for the purpose of resale was a crime until the late 1800s. England repealed analogous prohibitions a century earlier. Currently, the government imposes price schedules on more than 200 categories of consumer goods.

Assigning a fair price to any commodity administratively requires the decision-maker to adopt some measure of value other than supply and demand. Such a system assumes the existence of an objective measure of worth or utility apart from the market. The Soviets have adopted one such model, calculating inventors' compensation by determining coeffi-

38. *Diario Oficial* (Dec. 30, 1972).

cients of difficulty, novelty, and extent of adoption of each new machine, process or compound. Experience in the U.S.S.R. reveals that administrators often assign such coefficients arbitrarily. Scholarly commentary is divided on the issue of radical reform or abolition of the present method of compensation. One side of this debate maintains that the purpose of any invention is to solve an existing problem and that the best measure of its value is the amount which the firm with the problem is willing to pay, not the price which an administrator may compose.

In addition to imputing an objective value to be administratively derived outside the market, Mexico's statute on technology transfer also diminishes the right of the owner to exclude others from the know-how. Under the statute, any transfer of technology must be absolute. Unless the know-how is protected by a patent, a foreign licensor may not require the licensee to return technical documents, plans or secret information. In other words, leases of technical information are invalid. Only sales of know-how pass muster. The duration of the license may not exceed that period of time reasonably necessary to assimilate the technology in the opinion of the Registry. Foreign licensors are not entitled to insist that the secrecy of the technology be maintained thereafter and may not prevent the know-how from becoming available to their competitors.

The essential effect of the law is to strip foreign technology which crosses the Mexican border of its character as a commodity by restricting the exercise of autonomy and egoism by its owner. The master of know-how may no longer determine to whom it will be available or at what price. Technology ceases to be a commodity and becomes a public utility, allocated administratively, not contractually. To the extent that the Registry renders the right to exclude and to bargain insecure, investment in the private creation of technology may be expected to diminish.

Legal systems tend to endow values with the characteristics of property when they become legitimate objects of exchange. When the law transforms private commodities into public goods and strips the owner of the right to exclude, they cease to be objects of contractual exchange. Any society which aspires to allocate the factors of production by administrative means must also fashion a method for creating value by administrative means. The Soviet experience offers little encouragement for nationally planned innovation.

During the course of the nineteenth century, inventive ideas became a form of property in the United States.³⁹ At the beginning of that era, Thomas Jefferson, an inventor and for a time chief administrator of the patent system, opined that excluding other persons from one's inventions was opposed to natural reason. At that time the statutory criteria of patentability were indefinite and included a requirement of objective utility. Judges declared patents invalid if, in their eyes, the invention tended to

39. Armstrong, *From the Fetishism of Commodities to the Regulated Market: The Rise and Decline of Property*, 82 Nw. U.L. Rev. 79 (1988).

promote immoral conduct. Patents were an unstable form of property because the owner could hardly predict whether he would be able to enforce his right to exclude others.

Under the influence of the growth of market exchange, inventive ideas became a commodity by the close of the century. The courts reinterpreted the statute's requirement of utility so that the right to exclude no longer depended on such accidental considerations as the contribution of the invention to a judge's vision of the ideal society. The principal factors in this process of reinterpretation were first, the growing importance of market exchange throughout society, contributing to the ideology of the alienability of values and endowing intangible attributes with the characteristics of "things;" and second, an increasing tendency to treat patents as commodities as demonstrated by contracts to license and assign them. A general social development and profusion of market exchange, allied with specific development and contractual relations in inventive ideas, encouraged the legislature and judges to increase the security of this form of property. The circumstances under which the legal system would recognize a right to a patent and protect it from trespass became more predictable. By the beginning of the twentieth century, rights in patents had completed a very long journey which was begun in 1521 when Parliament first permitted the crown to confer patents as a matter of royal largesse.

Mexico adopted patent legislation but never experienced the process of commodification of inventive ideas which occurred in the United States. Legal, cultural and geographical restraints on trade have hindered the infusion of the notion that values such as land, labor and articles of consumption should be the objects of commerce. Subsequent pages will present evidence that Mexico has not fostered an inventive culture. Creation and implementation of inventive ideas has lagged behind the economies of the western industrial nations. Consequently, the legal form of property in inventive ideas, patent law, exists in Mexico, but is irrelevant. The right to exclude that patent which the law confers could be, and indeed has been, substantially diluted without noticeably affecting anyone's behavior.

A. *The Patent Laws of the Past*

The Patent Act of 1943⁴⁰ contained a variety of procedures through which a private concern, with the government's assistance, might compel the owner of a patent to grant a compulsory license to the invention. The purpose of these provisions was to prevent foreign firms from obtaining Mexican patents with no intent to exploit their inventions and merely for the purpose of blocking competition. One provision simply nullified a patent if the owner did not put the invention into practice within twelve years. If the owner did not exploit the patent within three years of the

40. Diario Oficial (Dec. 31, 1972).

date on which it was granted or exploited it "improperly" or "inefficiently," the government might order the owner to grant a compulsory license to another firm. Such a license required the transferee to pay royalties amounting to one-half of its profit from the exploitation of the invention.

Recalling that ninety-five percent of all Mexican patents are never "worked," the track record of petitions for compulsory licenses reveals the extent of domestic zeal to appropriate these inventive ideas. During the entire thirty-three year life of the Patent Act no one requested a compulsory license.⁴¹ The Secretary of Industry and Commerce did nullify a number of patents, but not at the request of parties who desired to use the technology. The usual grounds for cancelation were the failure of the patentee to pay an annual tax.

The record in the middle decades of this century revealed two salient characteristics about innovation in Mexico. First, the overwhelming majority of patented inventions were not in use. Second, despite reasonable access to these idle inventions through procedures for compulsory licensing, competitors of patentees did not solicit the technology. If there was some characteristic of Mexican society impeding innovation, it was not the patent laws.

Nonetheless, the patent system did not escape the critical analysis of the dependencia theory, whose adherents determined that laws protecting intellectual property were the villain. Introducing legislative reform in 1975, the Undersecretary of Commerce and Industry offered a new conception of the purpose of property:

Those lines of free-bourgeois ideology of the past century which consider patents as a natural property right and a monopolistic privilege which can be exercised without taking account of the public interest are not acceptable or valid. Today, without removing the encouragement to inventors, it is universally recognized that the exercise of their rights should be limited by the interests of the collective . . .⁴²

The leading contemporary text on patents asserted the same proposition, though less expansively. The author recognized, in contrast to the Undersecretary, that "natural rights" have never really been a significant justification for patents.⁴³ He confirmed that institutions of property law exist to further public policy. "[T]he patent is not a natural right of the inventor but a prerogative which the state grants so that the community may obtain the benefit of knowledge of the invention, its appropriate publication and its effective exploitation." If these benefits are missing, the patent loses its justification. The author's analysis implicitly explains a fundamental departure from the principles of the patent law of the United States. In this country, the government grants patents in consid-

41. C. SEPULVEDA, *EL SISTEMA MEXICANO DE PROPIEDAD INDUSTRIAL* 84 (1981).

42. J. SOBERANIS, *supra* note 3, at 46-47.

43. *Id.* at 160.

eration for the inventor's full disclosure of the technology. He has no obligation to work the invention. In Mexico, the inventor satisfies society's demands only if he discloses and exploits the device or process.

B. *The Patent Law of 1976*

The new patent legislation of 1976 implemented a number of significant changes. Its aggregate effect was to diminish further the right of an inventor to exclude others from his creation. The rationale was to encourage innovation. The new Law on Inventions and Trademarks reduced the number of fields in which patents were available, created new provisions on compulsory licenses, reduced the duration of patent grants, and introduced Soviet style certificates of invention.

The Act declares that "the granting of a patent implies the obligation to exploit it on national territory."⁴⁴ An owner's use of the invention must be more than symbolic. It must be an "effective industrial exploitation." If the owner has not begun to work the patent himself or licensed it to another firm within three years, the invention enters the public domain. Thereafter, any person may apply to the Secretary of Commerce and Industry for a compulsory license. An application must allege that the owner is not exploiting the invention or that his use of the invention is inadequate to satisfy the national market. The Act provides that the Director General of Patents and Trademarks may grant such a license, in consultation with the National Registry of Technology Transfer, determining its duration, field of use, and amount of royalties.⁴⁵ If no one applies for a compulsory license within one year of the date on which they become available, the patent lapses and the owner loses the right to exclude others from the invention entirely.

Compulsory licenses were available under prior law but no one sought them. The explanation, said some experts, was the cumbersome procedure and rigid requirement of compensation in the amount of half the licensee's profit. The procedure is now clearer, the requirements for compensation more flexible; however, there still have been no applications for compulsory licenses.

The new law also provides that the government will not issue patents for certain types of inventions. These categories include procedures for obtaining chemical compounds, for making alloys or for preparing pharmaceuticals, medicines, food, beverages, fertilizer, pesticides and for inventions with application to the field of nuclear energy. The creator of such an invention excluded from patentability may obtain a certificate of invention.⁴⁶ This legal device, a transplant from the U.S.S.R., strips the inventor of the right to exclude others from the device or process but permits him to collect compensation from firms which adopt it. In the

44. *Ley de Invenciones y Marcas*, Diario Oficial, art. 41 (Feb. 10, 1976).

45. *Id.* at art. 52.

46. *Id.* at art. 65.

Soviet Union, an invention protected by such a certificate is available for use by all state-owned firms and the inventor's compensation depends upon the savings which the device produces in practice or its utility to society as measured by coefficients such as novelty, and difficulty.⁴⁷ The Mexican patent statute contemplates that the inventor and would-be transferees of technology protected by a certificate will initially attempt to negotiate terms of compensation. Recognizing the futility of negotiations concerning the price of a thing from which one party may not in any case exclude the other, the law also contains procedures for arbitration by various agencies.

An authoritative text on the rights of inventors observes that the Mexican government adopted certificates of invention owing to the low incidence of patent exploitation in the country.⁴⁸ Four thousand certificates were issued between 1976 and 1981. Ninety-five percent of the applicants were foreign firms. These inventors do not elect certificates of invention in preference to patents. They obtain certificates for technology which is not patentable subject matter and which could not be protected by any other form of industrial property. In this respect, the 1976 Law on Patents was unobjectionable to inventors. The treatise writer observes that foreign firms find certificates of invention attractive because "the exploitation of the invention by other parties does not exclude the owner of the invention from working it in competition with the one who obtains the license."⁴⁹

In fact, in Mexico a low fence excludes trespassers from technology equally as well as a high wall. In the first five years after they became available, no one applied to the National Registry of Technology Transfer for permission to use a certificate of invention.⁵⁰ This experience shows that the principal impediment to innovation is not the power to monopolize inventions which the laws on intellectual property confer. Patents are unnecessary to protect inventions from trespassers because other firms manifest no interest in appropriating the technology. Although the law of intellectual property has permitted inventors to exclude others, the dilution of this right by successive legislative reforms has not stimulated innovation. Patent law endowed inventive ideas with the form of commodities, but could not give them the essence of property: value circulating in the market.

The prerequisites for commodification of a value are two. The first is diffusion of market exchange in a society, creating an ideology which progressively justifies alienation of more personal and community attributes, in other words a materialist philosophy of egoism and autonomy. The second prerequisite is an appreciation of the commercial utility of the partic-

47. Armstrong, *Legal Restraints on Innovation in the U.S.S.R.*, 9 REV. SOCIALIST L. 243 (1983).

48. Sepulveda, *supra* note 41, at 99.

49. *Id.* at 102.

50. *Id.* at 103.

ular value by those segments of society which might employ it. Mexico has never developed an ideology of egoism and autonomy. The principal philosophical currents of the 1910 revolution were communitarian, a reaction to privatization of land and proletarianization of rural labor. Contemporary limitations on freedom of contract are lineal descendants of medieval Spanish paternalism. The first prerequisite of commodification of values is absent. The remaining pages are devoted to the second, the role of science.

FINAL OBSERVATIONS

Dependencia theory, which influenced public policy inordinately in the 1970s, maintained that the dominant role of foreign capital impeded domestic research and development. The principal consumers of advanced technology are allied or subservient to transnational corporations. These firms exercise their power as stockholders or contractors to require Mexican firms to purchase foreign know-how in preference to native technology.

No observer of Mexican industry denies that the economy relies heavily on technology of foreign origin; however, many analysts part company with dependencia theorists on the issue of causation. Some respected scholars confess that reliance upon foreign know-how is the effect, not the cause of inadequate domestic research and development. Those analysts who seek an explanation for the plight of science at home generally locate the cause in either a failure of governmental policy or their country's traditions. These are not mutually exclusive schools of thought, and the most perceptive analysts attribute part of the blame for the absence of domestic technology to political and cultural factors, and assign some responsibility to foreign ownership of Mexican firms.

Two studies published in the early 1970s indicate the scope of the problem. One report stated that in all of Mexico only 600 scientists devoted their time fully to research in problems associated with industrial production.⁵¹ At about the same time, *Excelsior* disclosed that in the United States and USSR, one-half of one percent of the population was engaged in scientific activity. The corresponding figure in Mexico was reported to be 0.007 percent.⁵²

Analysts who attribute the deficit of scientific research to governmental policy often criticize the country's educational system. Occasionally they also call for more national planning. Michael Wionczek has written of the need for a "profound reform of national education, whose deficient functioning during recent decades has affected very seriously both the capacity to adopt imported technology and the development of indigenous technology."⁵³ Inadequacies in the educational system not

51. Garcia, *supra* note 20 at 750.

52. *Excelsior*, Jan. 11, 1972.

53. M. WIONCZEK, *COMERCIO DE TECNOLOGIA Y SUBDESARROLLO ECONOMICO* 270 (1973).

only prevent the training of scientists, they impede the implementation of any sensible policy. The bureaucrats who order equipment for laboratories "haven't the slightest idea of what they are doing."⁵⁴

Other writers refer to the need for "a national system for the production of scientific and technical knowledge" without which "autonomous innovation" is impossible.⁵⁵ Such a program might include fellowships and incentives to pursue investigation in areas of critical importance. These writers maintain that a governmental policy which financed research in food production, public health and other social sectors would encourage indigenous research and respond to the nation's need.

On the one hand, analysts lament "the absence of a concerted political will to support" public expenditures on science,⁵⁶ yet the same writers complain that bureaucracy is "the number one enemy of science in Mexico."⁵⁷ Government funding is not easily divorced from red tape, bureaucracy and patronage. Those who supply the resources are unwilling to relinquish control. One writer says the National Council of Science and Technology's "assignment is long-term and has only just begun."⁵⁸ Another criticizes the agency for having "all of the characteristics of a bureaucratically burdened machine."⁵⁹ A self-examination published by one leading research center complained that scientific investigations in its faculty "have unfolded without adequate coordination and with almost no support and comprehension."⁶⁰ Prescribing more government funding for science, the report hastened to add that planning "should not be centrally imposed." Members of research institutions should be permitted "to adopt their objectives freely."

More than one observer has argued that regulation of transnational technology licenses and patents, the only tangible fruits of the government's science policy, does nothing to enhance the domestic base of research and development. At best, these controls only remove the control of foreign owners from know-how which crosses the border. They do not insure that Mexico will assimilate the new technology or that the country's scientists will use the information as a basis for further research. Foreign technology can only stimulate domestic research if the regulatory measures already in place "have the support of a well defined industrial policy . . . closely integrated with a national development policy."⁶¹

54. Excelsior, Interview (Jan. 17, 1972).

55. E. Leff, *Dependencia Científico-Tecnológica y Desarrollo Económico*, in MEXICO Hov, at 279 (P. Casanova and E. Florescano eds., 1979).

56. Wionczek, *Obstáculos Para la Aplicación de la Ciencia y la Tecnología al Desarrollo Económico y Social de los Países Menos Desarrollados*, 50 EL TRIMESTRE ECONOMICO 523 (1983).

57. Wionczek, *supra* note 55.

58. SOBERANIS, *supra* note 3 at 228.

59. Wionczek, *supra* note 55.

60. Excelsior (Mar. 10, 1975).

61. Wionczek, *El Mundo Subdesarrollado y las Corporaciones Transnacionales*, 48 EL TRIMESTRE ECONOMICO 84 (1981).

Neither controls on foreign transactions nor funding for local research are effective to create a technological society unless the potential consumers of science appreciate its utility. At present, the cultural elements which influence both the supply and the demand for technology are weak. An editorial in the foreign trade journal, *Comercio Exterior*, referred to the country's "lack of general scientific and technical culture." Removal of the barriers to access to knowledge and funding for local research "are hardly solutions in themselves," because scientific activities are "conditioned by society."⁶²

The writer is referring to the feebleness of the urge to innovate among the business community of Mexico. Industrialists do not generally seek labor saving, cost cutting or product enhancing practices through research and development. A survey conducted by the Organization of Economic Cooperation and Development disclosed that only ten of the 137 industrialists who responded believed that absence of research and development was an obstacle to their business.⁶³ Another survey of the attitudes of business representatives toward science reveals "the great ignorance which exists among Mexican industrialists not only of the advantages which scientific and technological investigation would bring, but also, of what these activities entail."⁶⁴

Business owners have not sought innovation because the government has traditionally protected them from competition. The climate has not compelled them to improve to survive. In addition, regulations determine the retail price of commodities on the basis of their cost. The regulations permit manufacturers a profit which is a percentage of the cost of inputs. Paradoxically, innovation diminishes profitability in regulated industries if it reduces costs. The growth in the share of the industrial sector which the government owns has also stifled the necessity for innovation. Profitability is a tertiary concern of the managers of quasi-state enterprises who are untroubled by competition. National economic planning also diminishes the scope of local, flexible managerial decision. To the extent that government ministries determine the mission and the factors of production for firms, the opportunities for innovation diminish.

The respected author of a treatise on the law of inventions writes that Mexico is plagued by "the absence of a tradition of technical and scientific investigation."⁶⁵ He then refers to a second cause for the dearth of research which appears to be distinct from the first, saying, "[w]e also have been lacking in an industrial system of our own in which a climate favorable to technical advances exists." These causes are not separate, they are dialectical, as the author himself recognizes. "There does not exist then an imperative necessity for innovation here." The absence of de-

62. *Comercio Exterior*, at 77 (Mar. 1977).

63. WIONCZEK, *supra* note 11, at 50.

64. *Id.*

65. Sepulveda, *supra* note 41, at 107.

mand for the fruits of research has aggravated the social status and funding of the scientific community, encouraging talented people to enter other professions or to emigrate. There is a shortage of domestic invention because there is a poverty of industrial innovation.

CONCLUSION

The solution to this crisis is not merely "to learn that we need to know," as one editorialist writes.⁶⁶ The social impediments to innovation are profound. They are objective, not a result of misperception. Their roots are buried in the colonial past. Mexico's government cannot dismantle this tradition or reconstruct the temperament and beliefs of its people. Neither can it create a market economy by a revolution from above. The country's administered economic system is not the flower of caprice. It has developed in response to the confluence of custom and political power. Mexico's challenge is to turn inward, to examine its own experience and to reform the economy without prejudice to its fundamental values so that regulation and planning may nurture autonomy and egoism.

66. *Excelsior* (Jan. 11, 1972).

