Finally, the authors suggest reforms. Ultimately, this volume must be judged by its conclusions, and the recommendations of the authors are far-reaching. The book begins with the proposition that the role of the academic medical center is far broader than biomedical research alone, that government cannot acquiesce easily to requests for larger and larger sums for research, and that government, presumably representing the people, and the academic center, presumably dedicated to the public interest, should become allies rather than adversaries. The concerns of public policy remain in the authors' view equitable access, cost containment, physician surplus, runaway technology, and the need for rational regional organization of health services. The academic center is seen in social conflict with each of these concerns.

Four conclusions are offered. First, the academic medical center is a new, critical, and very real force. Second, it must develop a new mission, that of service to the surrounding locale. Third, someone must run it. Finally, it must develop planning and financial resources that will enable it to meet changing priorities over time.

These arguments are strong. There is indeed a major force represented by the academic medical center, and if anyone is in charge his or her identity is certainly not clear to this reviewer, who also sees growth by economic opportunism as dominating any consistent approach toward any defined institutional goals. The technology is indeed runaway, often wasteful, and almost always unevaluated and follows a technological imperative rather than a clinical need. The criticism could have been extended to include a preoccupation with curative rather than preventive approaches, emphasis on disease rather than host, and ignorance of behavioral and social antecedents of disease.

The strengths of its criticisms notwithstanding, there is an annoying political undertone to the book, and it arrives at disturbingly predictable recommendations without any serious discussion of alternative models for citadelian cure. The potential role of health services research in providing feedback about social impact to the originators of new technology is scarcely discussed. It is not clear whether the authors would decrease the biomedical commitment (quite likely this would be a bad idea) or increase the overall mission of an already overgrown institution. The community services required, and the educational structure to support them, could be served by peripheralization of the center as well as by centralization. There is scant discussion of the actual nature of the health burden of chronic disease, and the question of the quality of care, measured against patient outcome, never seems to come up. There are many such legitimate issues, and the ultimate failure of this book is that it is a brief for a particular (though possibly correct) set of solutions without adequate discussion of the alternatives.

The academic medical center requires examination. What is it? What does it do? And what should it do? This book opens a dialogue. Meaningful change in medical paradigms cannot easily occur without changes in the underlying institutional structures. Those interested in health policy, in medical education, in the quality of medical care, and in the national health care cost are well advised to carefully evaluate the arguments presented here.

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Underdevelopment: Test of a Theory

The Pharmaceutical Industry and Dependency in the Third World. GARY GEREFFI. Princeton University Press, Princeton, N.J., 1983. xiv, 292 pp. $25; paper, $9.95.

The persistent poverty of the less-developed countries (LDC's) has of late inspired a new explanation for underdevelopment—dependency. Mainstream social scientists in the United States have long focused on problems indigenous to the Third World as causes of underdevelopment—shortages of skilled labor, absence of entrepreneurship, inadequate pools of capital, illegitimate political institutions, local markets so small as to prevent achievement of economies of scale, and on and on. Dependency theorists reject such explanations. The central cause of underdevelopment from their perspective is none other than the developed nations themselves, especially the United States.

For dependency theorists, development and underdevelopment are "opposite sides of the same coin," namely the world capitalist system. Underdevelopment results when nations are integrated into this system on artificially asymmetrical terms. This asymmetry is imposed by the political and economic power of developed nations (the "center") and maintained in conspiracy with transnational corporations (TNC's) and local political elites. Underdevelopment is self-perpetuating unless LDC's (the "periphery") break away from the world capitalist system, thereby achieving "autonomy." Dependency theorists thus continue the twin socialist traditions of focusing on the distribution of given wealth rather than on the creation of wealth itself and of regarding markets as facades for exploitation rather than as mechanisms for efficient allocation of scarce resources.

As an attempted demonstration of the predictive power of dependency theory, Gary Gereffi has conducted a fascinating analysis of a startling and almost unique phenomenon—LDC (in this case Mexican) dominance of a high-technology industry. Steroid hormones are an especially important class of pharmaceuticals, including the corticoids (such as cortisone) and the sex hormones (such as birth control pills). In 1955, more than 80 percent of the world supply of steroid hormones came from Mexico, a Mexican firm (Syntex) was foremost in the world industry in terms of technology, and the domestic Mexican industry was almost exclusively locally owned. Gereffi argues that this singular instance of LDC preeminence provides a "least-likely crucial-case" test for dependency theory. In plain English, the argument is that the mid-1950's Mexican steroid hormone industry was an extremely improbable candidate for dependent status vis-à-vis the developed nations; if "dependency" emerges even under these propitious circumstances, then exploitation must be regarded as the norm of world capitalism and direct LDC government intervention toward disengagement from the center becomes the only viable strategy for peripheral development.

Turning Gereffi's jargon on himself, it can be argued that the book under review provides a "most-likely crucial-case" test for dependency theory. The text is excellently written; the material is fascinating and extremely salient; and Gereffi himself is an obviously humane and competent scholar whose common sense and commitment to truth far outweigh any ideological objectives. If a convincing case cannot be made for dependency theory even under these circumstances, then the general prospects for the *dependistas* are bleak indeed.

The facts of the case under study are as follows. Prior to World War II, synthetic steroid hormones were manufactured by several European firms from animal materials such as cholesterol. These processes were extremely expensive and produced quite limited quantities. During the 1940's, émigré scientists working in Mexico discovered new techniques of synthesis based on plants growing wild in the Mexican jungle (especially the barbasco root). These scientists along with several émigré entrepreneurs founded Syntex in Mexico City in 1944, and by 1955 Syntex (and Mexico) accounted for the preponderance of world trade in steroid hormones. The basis of this competitive achievement was the sharply lower cost of barbasco-derived hormones—prices for progesterone fell from \$80 a gram in 1943 to 50¢ a gram in 1952 owing to Syntex products. Alongside Syntex, four other local firms (also founded by émigrés) and one state-owned firm (based on expropriated Axis holdings) produced and distributed steroid hormones. Yet by 1960 this "thriving domestic industry" had largely disappeared—Syntex relocated to Palo Alto in the United States, the remaining local firms became subsidiaries of foreign TNC's, and the state-owned firm became effectively defunct.

The reasons for Syntex's relocation are lucidly presented by Gereffi: a bureaucratic and corrupt Mexican government delayed visas for Syntex personnel and permits for essential pharmaceutical imports; pharmaceutical research is significantly more effective when performed directly in major markets; and, most important, corporate research staffs need access to and are more easily attracted from an existing biomedical research infrastructure, and that infrastructure was vastly inferior in Mexico as compared to the United States.

The transfer of ownership for Syntex's competition was also an entirely natural response to market forces. High-technology industries are characterized by extensive vertical integration. For the most part, this structural arrangement is due to the need of high-technology firms to earn significant markups over manufacturing costs to cover the expenses of developing new products and inducing consumers to adopt them. Licensing of these products to competition erodes the ability of the innovator to recoup development and introduction costs and is, unsurprisingly, avoided if possible. Thus Ford's Escort automobile, IBM's PC computer, and Smith Kline's Tagamet medicine are all manufactured and distributed (except at the retail level) directly by the innovator. Syntex's Mexican competitors, having failed to develop their own new drug products, were worth more as marketing arms for innovative TNC's than as independent generic firms, and as a consequence were sold.

Virtually the sole Mexican policy response to these developments was aborted OPEC-style attempts to monopolize barbasco, in 1955 and again in 1975. The first of these efforts (with Syntex as monopolist) was broken by direct U.S. government legal action against the firm, and the second (with a state-owned firm as monopolist) collapsed after foreign TNC's mounted a successful boycott of barbasco products.

For a mainstream social scientist reading Gereffi's balanced account of these events, several conclusions are immediate.

1) Research is the foundation of competitive position in the modern pharmaceutical industry. Yet Mexico did nothing to create a research infrastructure, to make state investments in pharmaceutical research, or to provide sufficient profit incentives for relocation of TNC laboratories to Mexico. Consequently, little or no pharmaceutical research is performed in Mexico and Mexican firms are competitively irrelevant on a world scale.

2) Monopoly is a problematic strategy for LDC's, in part because it can be successfully resisted by countervailing consumer organization, in part because it greatly speeds consumer acceptance of substitutes, but most of all because it does not create value and thus does not provide any long-run basis for competitive advantage.

3) The U.S. government and U.S. firms acted properly to defend against Mexican efforts at monopoly and technology piracy. Failure to undertake such defenses would constitute a betrayal of legitimate U.S. interests, and the defenses are in no way "exploitative" of LDC interests.

Gereffi's evaluation of these events, however, is distinctly different. In his judgment, the absence of a viable Mexican industry manufacturing finished steroid products and discovering new ones is due entirely to the "multifaceted dependency relations in which the country was enmeshed." These dependency relations led to a pronounced "inequitable distribution of benefits favoring the central capitalistic economies and the TNCs more than Mexico." Finally, Gereffi argues that U.S. and TNC economic imperialism prevented Mexico from reversing this situation. What is the basis for this remarkable leap into leftist euphoria? Several factors contribute:

1) *Semantic inconsistency*. The terms "competitive" and "monopolistic" change meaning for Gereffi with the identity of the seller. When Mexicans sell to competitive markets, as is the case with peasant barbasco collectors or Mexican steroid exporters, then these markets are "exploitative." When Mexicans attempt to monopolize sales of barbasco, this is a legitimate exercise of state authority. In contrast, when TNC's exercise monopoly powers, they are "exploitative," and competition among TNC's is seen as desirable. Further, Gereffi uses the term "pharmaceutical firm" to mean both generic drug house and innovative drug firm. Many of his comments on the viability of LDC drug firms make sense only in reference to generic firms, yet generic firms are inherently and severely limited in their abilities to compete with innovative firms, especially in world markets. With this tactic, both alleged "inequities" and the viability of local "drug firms" are significantly misrepresented.

2) *Wishful analysis*. Gereffi persists in regarding wholesale segments of modern technological reality as artifacts of monopoly exploitation created exclusively to exclude and oppress competition. Among these evils are the average \$70-million expense for discovery and testing of new drugs; the comparable expense of marketing new drugs to physicians; economies of scale in research and manufacture that lead to centralization of facilities in major markets; and the patent system. Though reforms of regulation, distribution, and patenting would somewhat reduce the costs of entry for LDC drug firms, Gereffi radically overstates the extent to which LDC firms can be competitively viable in innovative segments of this industry; it is virtually certain that such viability cannot be achieved without enormous investments.

3) *Causal confusion*. Gereffi identifies a series of significant problems LDC's experience with the pharmaceutical industry—tax evasion from TNC's, product hazards, inadequate provision of medicines to the poor, and limited generic competition—as manifestations of dependency and its "inequities." There are two immediate objections to this argument. First, though these problems are exacerbated by LDC poverty, they are quite prevalent in developed nations.

There is absolutely no reason for regarding dependency as cause or autonomy as cure for them. Second, by blurring objectives Gereffi fails to acknowledge that significant trade-offs exist among them; for example, low drug prices enable greater access to medicines by the poor but restrict the flow of funds available for development of local industry. This causal confusion is ultimately the most objectionable feature of dependency analysis. By obfuscating the true causes of legitimate and often pressing LDC problems, dependency theorists hamper rather than promote effective and just resolutions.

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The Agricultural Sector in China

Agriculture in China's Modern Economic Development. NICHOLAS R. LARDY. Cambridge University Press, New York, 1983. xiv, 285 pp. $37.50.

Unlike many recent writers on China, the author of this study of Chinese agriculture avoids taking a "position" of either censure or apology. Rather, Lardy casts the tone of the book by refusing to say that the first 35 years of socialism contained monumental errors. Instead, he invites the reader to consider three paradoxes:

1) That periods of great technological improvement saw stagnation in total output growth. (During the five chapters of the book, Lardy explains this paradox by showing that periods of excessive quantitative controls and cadre intervention in decision-making happened to coincide with times of technical change.)

2) That much of China's population remains malnourished despite a doubling of income per capita since the 1950's. (This paradox is later explained by the lack of intra- and inter-provincial trade to equalize the benefits of economic development.)

3) That Mao accorded to the peasantry a place at the vanguard of the proletariat yet continually subjected rural people to disruption and deprivation. (Lardy explains this paradox by demonstrating that Mao failed to understand the role of markets in squelching the bureaucracy, which he tried to accomplish through political campaigns.)

Having set out these intriguing paradoxes, Lardy further piques the reader's interest by posing six questions:

1) Has rapid industrial growth raised living standards in the rural areas? The answer to this question forms one of the key themes of the book, that balanced models of economic growth include agriculture not just as an exploited sector but as a major contributor to and beneficiary of growth. Because Mao thought a mere reorganization of the agricultural sector was sufficient, as contrasted with a full-scale investment strategy for industry, growth has not been balanced.

2) Why has industrial output grown at a rate of 11.3 percent annually but agricultural output at a rate of only 2.3 percent, just a step ahead of population growth at 2 percent? The answer combines the solution to question 1 above with that to paradox 1: that underinvestment during periods of technological change in agriculture, notably during the mid-1960's, was crippling to both sectoral and national development efforts. There were also "negative interventions" that exploited agriculture without giving it the resources genuinely to contribute to rapid economic growth. These interventions included not just output quotas but also adverse terms of trade for China's agricultural producers, who faced a nitrogen-rice price ratio higher than in any other Asian country (and six times as high as in Taiwan Province) and a relative price for a 28-horsepower tractor twice that in Japan.

3) Have post-1949 policies preserved the dynamism of resource allocation that characterized farms in the 1930's? Lardy shows that inadequate price incentives for labor-intensive cash crops, the futile efforts of central planners to direct production without knowledge of local conditions, the tendency toward gigantism, which reduced the connection between effort and reward, and the overemphasis on regional self-sufficiency (rather than regional specialization and gains from trade) all contributed to a decline in factor productivity.

4) Have investment decisions between agriculture and industry taken into account the marginal productivity of scarce capital? In the absence of data giving absolute magnitudes, Lardy ingeniously compares the rates of investment and output growth for the two sectors. He concludes not only that agriculture has received a much lower share of investment than industry but that investments in agriculture would have had much higher payoffs.

5) Have rural people "caught up" with urban dwellers in terms of standard of living, and have income disparities within the rural areas themselves been reduced? This question is the key to a socialist strategy of development, yet Lardy shows that egalitarian China has left as many poor in the wake of development as the countries of the First World in their early stages: "China is probably the only country in modern times to combine, over twenty years, a doubling of real per capita national income . . . and constant or even slightly declining average food consumption" (p. 159). Given the avowed goals of the government of China, this conclusion is truly paradoxical until one views through Lardy's eyes the inevitable effects of underinvestment, controlled and even reverse migration, inflexible and even regressive tax rates, emphases on quantity (as opposed to price) controls and regional self-sufficiency, and the pro-urban, pro-industrial bias of the leadership. To strengthen his point, Lardy critically summarizes estimates by earlier authors of per capita calorie and protein consumption to show that between 1957 and 1976–78 the levels of both declined in China.

6) What are the prospects for reform in the future? In one of the most interesting chapters of the book, Lardy suggests that the impressive benefits from the Production Responsibility System, widely touted by both Chinese and Western authors, probably reflect the short-term gains that have characterized previous periods of recovery from bad policies. He displays up-to-date evidence from the Chinese press that Chinese leaders, either through ignorance of comparative advantage and the benefits of price stimuli or because of a more fundamental "residual pro-urban bias," are not ready to provide the comprehensive types of economic reform that would allow China to achieve true modernization of the economy by the year 2000. Only with an improved set of marketing and pricing policies complementary to the new policies on the production side can China resolve the other questions and paradoxes to which Lardy points. The reluctance of lower-level cadres to give up their control of local production, the fear on the part of higher-level cadres that an increased role of markets will push China away from producer goods, the poor understanding of the role of trade in specialization and productivity growth, and the simplistic trade-off between grain and nongrain production all augur ill for sustained economic reform and growth in China.