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THE STAGES OF ECONOMIC GROWTH

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THIS article summarizes a way of generalizing the sweep of modern economic history. The form of this generalization is a set of stages of growth, which can be designated as follows: the traditional society; the preconditions for take-off; the take-off; the drive to maturity; the age of high mass consumption. Beyond the age of high mass consumption lie the problems which are beginning to arise in a few societies, and which may arise generally when diminishing relative marginal utility sets in for real income itself.

These descriptive categories are rooted in certain dynamic propositions about supply, demand, and the pattern of production; and before indicating the historical content of the categories I shall briefly state the underlying propositions.

A Dynamic Theory of Production

The classical theory of production is formulated under essentially static assumptions which freeze —or permit only onceover change—in the variables most relevant to the process of economic growth. As modern economists have sought to merge classical production theory with Keynesian income analysis they have introduced the dynamic variables: population, technology, entrepreneurship, etc. But they have tended to do so in forms so rigid and general that their models cannot grip the essential phenomena of growth, as they appear to an economic historian. We require a dynamic theory of production which isolates not only the distribution of income between consumption, saving, and investment (and the balance of production between consumers and capital goods) but which focuses directly and in some detail on the composition of investment and on developments within particular sectors of the economy. The argument that follows is based on such a flexible, disaggregated theory of production.

When the conventional limits on the theory of production are widened, it is possible to define theoretical equilibrium positions not only for output, investment, and consumption as a whole, but for each sector of the economy.[1] Within the framework set by forces determining the total level of output,

[1] W. W. Rostow, *The Process of Economic Growth* (Oxford, 1953), especially Chapter IV. Also 'Trends in the Allocation of Resources in Secular Growth', Chapter 15, *Economic Progress*, ed. Leon H. Dupriez, with the assistance of Douglas C. Hague (Louvain, 1955); also, 'The Take-off into Self-Sustained Growth', *Economic Journal* (March 1956).

sectoral optimum positions are determined, on the side of demand, by the levels of income and of population, and by the character of tastes; on the side of supply, by the state of technology and the quality of entrepreneurship, as the latter determines the proportion of technically available and potentially profitable innovations actually incorporated in the capital stock.[1] In addition, one must introduce an extremely significant empirical hypothesis; namely, that deceleration is the normal optimum path of a sector, due to a variety of factors operating on it, from the side of both supply and demand.[2] The equilibria which emerge from the application of these criteria are a set of sectoral paths, from which flows, as first derivatives, a sequence of optimum patterns of investment.

Historical patterns of investment did not, of course, exactly follow these optimum patterns. They were distorted by imperfections in the private investment process; by the policies of governments; and by the impact of wars. Wars temporarily altered the profitable directions of investment by setting up arbitrary demands and by changing the conditions of supply; they destroyed capital; and, occasionally, they accelerated the development of new technology relevant to the peacetime economy and shifted the political and social framework in ways conducive to peacetime growth.[3] The historical sequence of business cycles and trend periods results from these deviations of actual from optimal patterns; and such fluctuations, along with the impact of wars, yield historical paths of growth which differ from those which the optima, calculated before the event, would have yielded. Nevertheless, the economic history of growing societies takes a part of its rude shape from the effort of societies to approximate the optimum sectoral paths.

At any period of time, the rate of growth in the sectors will vary greatly; and it is possible to isolate empirically certain leadings sectors, at early stages of their evolution, whose rapid rate of expansion plays an essential direct and indirect role in maintaining the overall momentum of the economy.[4] For some purposes it is useful to characterize an economy in terms of its leading sectors; and a part of the technical basis for the stages of growth lies in the changing sequence of leading sectors. In essence it is the fact that sectors tend to have a rapid growth phase, early in their life, that makes it possible and useful to regard economic history as a sequence of stages rather than merely as a continuum, within which nature never makes a jump.

The stages of growth also require, however, that elasticities of demand be taken into account, and that this familiar concept be widened; for these rapid growth phases in the sectors derive not merely from the discontinuity of production functions but also from high price or income elasticities of demand. Leading sectors are determined not merely by the changing flow of technology and the changing willingness of entrepreneurs to accept available innovations: they are also partially determined by those types of demand which have exhibited high elasticity with respect to price, income, or both.

The demand for resources has resulted, however, not merely from demands set up by private taste and choice, but also from social decisions and from the

[1] In a closed model, a dynamic theory of production must account for changing stocks of basic and applied science, as sectoral aspects of investment, which is done in *The Process of Economic Growth*, especially pp. 22–25.

[2] *Ibid.* pp. 96–103.

[3] *Ibid.* Chapter VII, especially pp. 164–167.

[4] For a discussion of the leading sectors, their direct and indirect consequences, and the diverse routes of their impact, see 'Trends in the Allocation of Resources in Secular Growth', *op. cit.*

policies of governments—whether democratically responsive or not. It is necessary, therefore, to look at the choices made by societies in the disposition of their resources in terms which transcend conventional market processes. It is necessary to look at their welfare functions, in the widest sense, including the non-economic processes which determined them.

The course of birth rates, for example, represents one form of welfare choice made by societies, as income has changed; and population curves reflect (in addition to changing death rates) how the calculus about family size was made in the various stages; from the usual (but not universal) decline in birth rates, during or soon after the take off, as urbanization took hold and progress became a palpable possibility, to the recent rise, as Americans (and others in societies marked by high mass consumption) have appeared to seek in larger families, values beyond those afforded by economic security and by an ample supply of durable consumers goods and services.

And there are other decisions as well that societies have made as the choices open to them have been altered by the unfolding process of economic growth; and these broad collective decisions, determined by many factors—deep in history, culture, and the active political process—outside the market place, have interplayed with the dynamics of market demand, risk-taking, technology and entrepreneurship, to determine the specific content of the stages of growth for each society.

How, for example, should the traditional society react to the intrusion of a more advanced power: with cohesion, promptness, and vigour, like the Japanese; by making a virtue of fecklessness, like the oppressed Irish of the eighteenth century; by slowly and reluctantly altering the traditional society like the Chinese? When independent modern nationhood was achieved, how should the national energies be disposed: in external aggression, to right old wrongs or to exploit newly created or perceived possibilities for enlarged national power; in completing and refining the political victory of the new national government over old regional interests; or in modernizing the economy?

Once growth is under way, with the take-off, to what extent should the requirements of diffusing modern technology and maximizing the rate of growth be moderated by the desire to increase consumption *per capita* and to increase welfare?

When technological maturity is reached, and the nation has at its command a modernized and differentiated industrial machine, to what ends should it be put, and in what proportions: to increase social security, through the welfare state; to expand mass consumption into the range of durable consumers goods and services; to increase the nation's stature and power on the world scene; or to increase leisure? And then the further question, where history offers us only fragments: what to do when the increase in real income itself loses its charm? Babies; boredom; three-day weekends; the moon; or the creation of new inner, human frontiers in substitution for the imperatives of scarcity?

In surveying now the broad contours of each stage of growth, we are examining, then, not merely the sectoral structure of economies, as they transformed themselves for growth, and grew; we are also examining a succession of strategic choices made by various societies concerning the disposition of their resources, which include but transcend the income and price elasticities of demand.

The Traditional Society

The central economic fact about traditional societies is that they evolved within limited production functions. Both in the more distant past and in recent times the story of traditional societies is a story of endless change, reflected in the scale and patterns of trade, the level of agricultural output and productivity, the scale of manufactures, fluctuations in population and real income. But limitations of technology decreed a ceiling beyond which they could not penetrate. They did not lack inventiveness and innovations, some of high productivity. But they did lack a systematic understanding of their physical environment capable of making invention a more or less regular current flow, rather than a stock of *ad hoc* achievements inherited from the past. They lacked, in short, the tools and the outlook towards the physical world of the post-Newtonian era.

It followed from this productivity ceiling that food production absorbed 75 per cent or more of the working force and that a high proportion of income above minimum consumption levels was spent in non-productive or low productivity outlays: religious and other monuments; wars; high living for those who controlled land rents; and for poorer folk, there was a beggar-thy-neighbour struggle for land or the dissipation of the occasional surplus in an expensive wedding or funeral. Social values were geared to the limited horizons which men could perceive to be open to them; and social structures tended to hierarchy, although the traditional societies never wholly lacked paths for vertical mobility. The centre of gravity of political power tended to reside in the regions, with the landowners, despite a fluctuating tension with those who—along with their soldiers and civil servants—exercised a degree of central authority.

The Preconditions for Take-off

The initial preconditions for take-off were created in Western Europe out of two characteristics of the post-medieval world which interacted and reinforced each other: the gradual evolution of modern science and the modern scientific attitude; and the lateral innovation that came with the discovery of new lands and the rediscovery of old, converging with the impulse to create new technology at certain strategic points. The widening of the market—both within Europe and overseas—brought not only trade, but increased specialization of production, increased inter-regional and international dependence, enlarged institutions of finance, and increased market incentives to create new production functions. The whole process was heightened by the extension to trade and colonies of the old dynastic competition for control over European territories, inherited from the world of traditional societies.[1]

Britain was the first of the European nations to move from the stage of preconditions into take-off, a fact capable of various explanations but certainly influenced by these circumstances: its achievement of a political and religious settlement by 1688; the area of social latitude and the limited but powerful incentives offered to nonconformists, who played a remarkable role in the process of industrial innovation; its naval and, thus, trading advantages,

[1] This analysis shares with Schumpeter's the view that the ultimate causes of war were inherited from traditional societies, and were not a consequence of the more or less rational pursuit of direct economic interests. But, whereas Schumpeter tends to emphasize the persistence of irrational and romantic nationalist attitudes, this analysis would underline the structural fact that, once national sovereignty was accepted as a rule of the world arena, nations found themselves gripped in an almost inescapable oligopolistic struggle for power, which did have elements of non-economic rationality.

partly determined by a greater freedom from commitments to land warfare than the French; an endowment in industrial raw materials superior to the Dutch.

The existence of the British take-off from, say, 1783, set in motion a series of positive and negative demonstration effects which progressively unhinged other traditional societies or accelerated the creation of the preconditions for take-off, where the preconditions process was already under way.[1] Before examining the manner in which these demonstration effects were communicated, however, the structural characteristics of the preconditions period should be defined.

Technically, the preconditions for sustained industrialization have generally required radical change in three non-industrial sectors. First, a build-up of social overhead capital, notably in transport. This build-up was necessary not merely to permit an economical national market to be created and to allow natural resources to be productively exploited, but also to permit the national government effectively to rule. Second, a technological revolution in agriculture. The processes at work during the preconditions generally yielded both a general rise in population and a disproportionate rise in urban populations. Increased productivity in agriculture has been generally a necessary condition for preventing the process of modernization from being throttled. Third, an expansion in imports financed by the more efficient production and marketing of some natural resources plus, where possible, capital imports. Such increased access to foreign exchange was required to permit the less advanced region or nation to increase the supply of the equipment and industrial raw materials it could not then itself supply, as well as to preserve the level of real income while social overhead capital of long gestation period was being created. Framed by these three forms of sectoral development, yielding both new markets and new inputs for industry, the initially small enclaves of modern industrial activity could begin to expand, and then sustain expansion, mainly by the plough-back of profits.

These technical developments required, in turn, prior or concurrent changes in the non-economic dimensions of the traditional society: a willingness of the agricultural community to accept new techniques and to respond to the possibilities of the widened commercial markets; the existence and freedom to operate of a new group of industrial entrepreneurs; and, above all, a national government capable not only of providing a setting of peaceful order which encouraged the new modernizing activities but also capable and willing to take a degree of direct responsibility for the build-up of social overhead capital (including its finance); for an appropriate trade policy; and often, as well, for the diffusion of new agricultural and industrial techniques.

The political dimension of the preconditions deserves a further word, due to the peculiar mixture of positive and negative ways the demonstration effects of industrialization were transmitted from more advanced societies. In part the transmission consisted in making men in less advanced societies perceive that new positive choices were open to them: longer life for themselves and their children; new ranges of consumption; new devices of productivity; higher levels of welfare. At least equally powerful, however, was the negative demonstration that more advanced societies could impose their will on the less

[1] This article will not examine the preconditions process in the nations which, in Louis Hartz's phrase were 'born free' of traditional societies, mainly deriving from a British society already well advanced in the preconditions process or in regular growth. I refer to the United States, Canada, New Zealand, Australia, etc.

advanced, through the exercise of military force. A reactive nationalist sentiment—rooted in a perception of the link between industrialization and effective power in the world arena—came to be an extremely important factor in leading men to take the steps necessary to unhinge and transform the traditional society in such ways as to permit growth to become its normal condition. Without the affront to human and national dignity caused by the intrusion of more advanced powers, the rate of modernization of traditional societies over the past century-and-a-half would have been much slower than, in fact, it has been.

Thus, it was not merely the German merchants but the German nationalists that led the way after 1848; not merely the Japanese merchants but the samurai after 1868; not merely the Russian middle class but a political, military, and civil service élite, smarting from the harsh lesson of the Crimean War and from a widening perception of the national costs of Russian backwardness; not merely the Chinese merchants, but the intellectuals and the younger soldiers who sought effective modernization, by various routes in the whole long, turbulent sweep from the Opium War and the Taiping Rebellion forward.[1] Ataturk's role in Turkey—and his motivation—constitute a more typical case of the preconditions process than, let us say, the role and motivation of the innovating British nonconformists of the eighteenth century. The evolution of colonial areas is also a version of the general case. There the positive and negative demonstration effects intermingled, under colonial rule; but they yielded, in the end, a local élite which accorded to political independence an over-riding and urgent priority.

While a reactive nationalism has been a powerful engine of modernization it also posed problems for economic development; for it did not immediately and directly prepare men to face and handle the homely economic tasks of the preconditions and the take-off. On the contrary, when a new national government was achieved—in the face of the colonial power, the traditional society, or both in combination—its leaders were tempted to go on with the familiar game of politics and power rather than to turn promptly to the domestic tasks of modernization. There were real or believed external wrongs and humiliations to be righted; there were still rear-guard actions from elements in the traditional society to be dealt with; and much energy and resource could be allocated to the political—and sometimes military—problem of consolidating the power of the centre over the old regional forces.

In short, some time often had to pass before men emerged in authority willing to accept the fact that the larger objectives of resurgent nationalism could not be achieved without turning wholeheartedly to the technical tasks

[1] An element of reactive nationalism is not wholly lacking from earlier cases as well, apparently more purely economic in their motivation. The more rapid evolution in Britain than on the Continent of the preconditions for take-off can be viewed, in part, as the product of a series of nationalist reactions to intrusion from more powerful or advanced neighbours: the Spanish in the sixteenth century; the Dutch in the seventeenth; the French in the eighteenth. These threats and national struggles may have yielded a sentiment which softened the rigidities of the traditional society, accelerated a new national settlement and permitted Britain to get on with the tasks of economic growth more effectively than others in the eighteenth century. And in the United States, too, the acceptance of the Constitution—reluctant at best—may have been made possible by a convergence of the desire of men of property to avoid the anarchy of a fragmented market and a certain casualness towards property rights, with the widespread perception in the mid-1780's that the United States might not be able to cope with more powerful nation states, intruding on the Confederation in one way or another, unless an effective central government existed. Hamilton's, nationalism, and his conviction that American industrialization was necessary, transcended motives of private economic advantage.

of economic growth.[1] Both in the more distant past and in the contemporary world it is possible and useful to view societies in the stage of preconditions in terms of the changing balances struck among these three possible expressions of reactive nationalism. Until a definitive political transformation occurs—which harnesses national energies, talents, and resources around the concrete tasks of economic growth—the take off is likely to be postponed: negatively, because the thin layer of modern technical and administrative talent in the society (as well as the society's margin of savings) is likely to be dissipated in activities of low or negative productivity; positively, because the government is unlikely to play its role effectively in the three sectoral developments—in social overhead capital, agriculture, and trade—necessary to create the matrix for sustained industrial growth.

The Take-off

As I have suggested in an earlier article,[2] the take-off consists, in essence, of the achievement of rapid growth in a limited group of sectors, where modern industrial techniques are applied. Historically, the leading sectors in take-off have ranged from cotton textiles (Britain and New England); to railroads (The United States, France, Germany, Canada, Russia); to modern timber-cutting and railroads (Sweden). In addition, agricultural processing, oil, import substitution industries, ship-building, and rapid expansions in military output have helped to provide the initial industrial surge.

The take-off is distinguished from earlier industrial surges by the fact that prior and concurrent developments make the application of modern industrial techniques a self-sustained rather than an abortive process. Not only must the momentum in the three key sectors of the preconditions be maintained but the corps of entrepreneurs and technicians must be enlarged, and the sources of capital must be institutionalized in such a way as to permit the economy to suffer structural shocks; to redispose its investment resources; and to resume growth. It is the requirement that the economy exhibit this resilience that justifies defining the take-off as embracing an interval of about two decades.

A result—and one key manifestation—of take-off is the ability of the society to sustain an annual rate of net investment of the order of, at least, ten per cent. This familiar (but essentially tautological) way of defining the take-off should not conceal the full range of transformations required before growth becomes a built-in feature of a society's habits and institutions.

In non-economic terms, the take-off usually witnesses a definitive social, political, and cultural victory of those who would modernize the economy over those who would either cling to the traditional society or seek other goals; but—because nationalism can be a social solvent as well as a diversionary force—the victory can assume forms of mutual accommodation, rather than the destruction of the traditional groups by the more modern; see, for example, the role of the Junkers in nascent industrial Germany; the persistence of much of traditional Japan beyond 1880. By and large, the maintenance of momentum for a generation persuades the society to persist; and to concentrate its efforts on

[1] In his forthcoming study of the preconditions process in Japan, Turkey, and India, Mr. Lawrence Barss of M.I.T. advances the hypothesis that it may be useful to distinguish two political stages, which he designates as the Transition and the Transformation. In the Transition, political life is dominated by men who want for their nations the benefits of modern independent status, but they are inhibited by many factors, including attitudes and ties of interest to the traditional society, from doing what must be done for economic growth. In the Transformation, a political leadership takes hold that, at last, means business.

[2] 'The Take-off into Self-Sustained Growth', *op. cit.*

extending the tricks of modern technology out beyond the sectors modernized during take-off.

The Drive to Maturity

After take-off there follows, then, what might be called the drive to maturity. There are a variety of ways a stage of economic maturity might be defined; but for these purposes it is defined as the period when a society has effectively applied the range of (then) modern technology to the bulk of its resources.

During the drive to maturity the industrial process is differentiated, with new leading sectors gathering momentum to supplant the older leading sectors of the take-off, where deceleration has increasingly slowed the pace of expansion. After the railway take-offs of the third quarter of the nineteenth century—with coal, iron, and heavy engineering at the centre of the growth process—it is steel, the new ships, chemicals, electricity, and the products of the modern machine tool that come to dominate the economy and sustain the over-all rate of growth. This is also, essentially, the case with the later Russian drive to maturity, after 1929. But in Sweden after 1890 it was the evolution from timber to wood-pulp and paper; from ore to high-grade steel and finely machined metal products. The leading sectors in the drive to maturity will be determined, then, not merely by the pool of technology but by the nature of resource endowments; and it may be shaped to a degree, as well, by the policies of governments. Although much further detailed analysis would be required to apply this definition rigorously, I would offer the following sample as rough symbolic dates for technological maturity.[1]

Great Britain	1850
United States	1900
Germany	1910
France	1910
Sweden	1930
Japan	1940
Russia	1950
Canada	1950

The meaning of this technological definition of maturity—and its limits—may be better perceived by considering briefly a few specific problems posed by these particular dates.

Is France, for example, on the eve of the First World War, to be regarded as technologically mature, despite its large, comfortable but technologically backward peasantry and its tendency to export large amounts of capital, despite certain technologically lagging industrial sectors? The case can, of course, be argued either way; but it does dramatize the need to allow, within the present definition, for regions of a nation or sectors of the economy to resist—for whatever reason—the full application of the range of modern technology. And this turns out to be generally true of nations which, by and large, one would judge mature. The United States of 1900 contained, after all, the South, whose take off can only be dated from the 1930's; and contemporary

[1] An oddity is to be noted. These dates, independently derived, come more or less sixty years after the dates established, on quite different criteria, for the beginning of take-off. There is no body of argument or evidence I can now offer to make rational such a uniformity. But it may be that when we explore the implications of some six decades of compound interest applied to the capital stock, in combination with three generations of men living under an environment of growth, elements of rationality will emerge.

mature Canada contains the still lagging province of Quebec. The technological definition of maturity must, then, be an approximation, when applied to a whole national society.

Japan as of 1940 poses a somewhat different problem. Can one rate as mature an economy with so labour-intensive an agricultural sector? The answer is affirmative only if one is prepared to take as a given—outside the definition of maturity—a society's decision about its population size. Within the Japanese population resource balance, its agriculture, with extraordinary refinement in the use of both water and chemical fertilizers, does indeed reflect a high form of modern technological achievement, even if modern farm machinery, designed to save labour, is capable of only limited use.

What about contemporary Russia, with more than 40 per cent of the working force still in agriculture and much modern technology still unapplied in consumers goods industries? Here again, the present definition of maturity would not predetermine how a society chooses to allocate its technological capabilities. By and large contemporary Russia is to be judged a mature economy despite the fact that its leaders have chosen for political reasons to bear the costs of a low productivity agriculture and have chosen to concentrate capital and technology in sectors other than manufactured consumption goods. Put another way, the obstacles to full modernization of the Russian economic structure do not lie in the supply of capital, entrepreneurial administrators, or technicians.

Finally, there is the case of Britain, mature on this definition as early, say, as the Crystal Palace Exhibition. How is one to deal with the long interval between the stage of its maturity, in terms of the effective application of mid-nineteenth century technology, and the next stage of growth: the age of high mass consumption, when the radical improvements in housing and durable consumers goods and services become the economy's leading sectors? The reasons for the gap in the British sequence lie in the nature of this next stage. The age of high mass consumption represents a direction of development a society may choose when it has achieved both technological maturity and a certain level of real income per head. Although income per head—and usually consumption per head—will rise in the drive to maturity, it is evident that there is no fixed connexion between technological maturity and any particular level of real consumption per head. The course of these variables after take-off will depend primarily on the society's population-resource balance and on its income distribution policy. The process of growth, by definition, raises income per head, but it does not necessarily lead to uniformity of *per capita* income among nations or, even, among regions within nations. There are—and there are likely to be—technologically mature societies that are, so to speak, both rich and poor. When historical data on national income are developed to permit systematic comparison, we are likely to find that incomes per head, at maturity, vary over a considerable range. Mid-century Britain would, presumably, stand low in that range. The improvements in real income and consumption per head that occurred in the second half of the nineteenth century took the form of improvements in diet, housing, and urban overhead capital which, while substantial, did not create within Britain new leading industrial sectors—at least down to the bicycle boom of the 1890's.[1]

[1] In a different perspective, it is possible to dismiss the gap between mid-nineteenth-century British technological maturity and twentieth-century high mass consumption as a simple product of technological history; that is, the technology of modern transportation, suburban

And so Britain, after Crystal Palace, moved onward in growth at a modest pace, using its capital and entrepreneurship substantially to help acquire resources with which it was not sufficiently endowed, and to help build the preconditions and assist the take-offs of other societies, suffering along the way some of the costs of having led in the process of industrialization, to enter the new century with most of its initial lead gone.[1] Put another way, the achievement of maturity by Western Europe and the United States early in the twentieth century, at the then existing level of technology, found Britain in a roughly equivalent position: while the newer nations had moved from take-off to maturity in the sixty years before the First World War, Britain had moved, in terms of income levels, from being a relatively poor mature society to being a relatively rich, mature society.

As societies move to technological maturity, the structure and quality of the working force change. The proportion of the population in agriculture and rural life decreases; and within the urban population the proportion of semi-skilled and white-collar workers increases.[2] This emergent working force is not only likely to organize itself with increasing effectiveness in the labour markets, but also to perceive that the industrial civilization of which it is a part can offer levels and types of consumption, not previously regarded as a realistic possibility on a mass basis. And the rise in real income per head is likely to make these new tastes effective. Further, the new working force, increasingly born to the city rather than transferred from the lower margins of rural life, is likely to perceive that it can bring its weight to bear on the political process in such ways as to make the government increasingly provide measures of social and economic security. Moreover, the character of leadership in industry begins to change as well. The take-off is usually managed by relatively modest, creative men with an insight as to how output in their sector can be radically expanded: the Boultons' and Lowells'. In the drive to maturity men take over with more grandiose visions, with a more acute sense of scale and of power:

housing, and household gadgetry did not exist in, say, the third quarter of the nineteenth century. And for many purposes that is a quite satisfactory way tol ook at the matter.

On the other hand, three considerations argue that it is worth regarding the British sequence in the second half of the nineteenth century as involving a gap. First, technology itself is, in its widest sense, not an independent variable (*Process of Economic Growth*, especially pp. 83–86). If the level of British incomes and consumption had been high enough, incentives might have existed which would have yielded a quite different evolution of technology. Second, the phenomenon of a gap in time between the attainment of technological maturity and the age of high mass consumption—the existence of relatively poor as well as rich mature societies—is more general than the British case. And a view of Britain in the second half of the nineteenth century as in the process of closing the gap may, for certain purposes, be linked suggestively to similar transitions in other societies. Third, much in British social, political, (and, even, entrepreneurial) history in the second half of the nineteenth century is typical of transformations in attitude and policy which have occurred in other societies after technological maturity has been attained: the beginnings of serious welfare legislation, with the Ten Hours Bill; the pressures and reflections which lead the society to accept the Second and Third Reform Bills; the emergence of political coalitions which damped the power of industrial interests; the mounting intellectual attention and public sentiment focused on problems of social reform, laying the bases for the pre-1914 Liberal measures and the emergence of the Labour Party. In short, even narrowly examined, much in British history in the period 1850–1900 is illuminated by the notion that this was a society which took its technological virtuosity as a given and, at a decorous rate, proceeded to seek, at the margin, welfare objectives beyond.

[1] The forces which relatively damped the rate of increase in British income and permitted its technological lead to be dissipated are, evidently, more complex than this sentence can suggest; but it would be inappropriate to this exposition to examine them at greater length here.

[2] Although Colin Clark's categories—of primary, secondary and tertiary activity—do not fit precisely this analysis, his pioneer compilations suggest that considerable uniformities in the structure of the working force of mature economies exist.

although there are vast differences between post-Civil War United States and Stalin's Russia, there is, nevertheless, a distant family resemblance between some of the great entrepreneurs of the American drive to maturity and the men who administered the Five Year Plans between, say, 1929 and 1953. At maturity, however, the professional managers become more important: the nameless comfortable, cautious committee-men who inherit and manage large sectors of the economy, while the society begins to seek objectives which include but transcend the application of modern technology to resources.

These sea-changes in the outlook and objectives of the working force and industrial management are likely to be accompanied by wider shifts in the society's mood, which the intellectuals and politicians articulate. They react against the harshness and social costs of the drive to maturity. The extension of industrialization ceases to be acceptable as an over-riding goal: in an extension of the law of diminishing relative marginal utility, men appear to place a lowered valuation on further increments to what they have in abundance, and, at the margin, to seek new satisfactions. In the pre-1914 drive to maturity of Western Europe and the United States one can find, in each nation, reflections of this mood gradually gathering strength, centred about the question: how shall the mature industrial machine, with compound interest built firmly into its structure, be used? In the 1930's it was faced by Japan; and in the 1950's it confronts Russia.

The Age of High Mass Consumption

There have been, essentially, three directions in which the mature economy could be turned once the society ceased to accept the extension of modern technology as a primary, if not over-riding objective: to offer, by public measures, increased security, welfare, and, perhaps, leisure to the working force; to provide enlarged private consumption—including single family homes and durable consumers goods and services—on a mass basis; to seek enlarged power for the mature nation on the world scene. A good deal of the history of the first half of the twentieth century can be told in terms of the pattern and succession of choices made by various mature societies as among these three alternatives.

After a brief and superficial flirtation with the attractions of world power at the turn of the century and after imposing a set of mild measures of social reform, during the Progressive period, the United States opted whole-heartedly in the 1920's for the second choice.[1] The boom of that decade was built squarely on the migration to suburbia, the mass extension of the automobile, and the household gadgetry which modern industry could provide. And these decisions to relocate the population and provide it with mobility, brought in their train not only new leading sectors—housing, automobiles, petroleum, rubber, electric-powered household devices, etc.—but also vast commitments to build new social overhead capital and commercial centres.

Down to 1914 Britain and Western Europe opted more substantially for public measures of social security, influenced perhaps by the higher proportions of urban population and by the greater power of socialist thought and political

[1] The time lag in the United States between the achievement of technological maturity in, say, 1900, and the high mass consumption boom of the 1920's is to be accounted for in part by the relative stagnation of industrial real wages in the pre-1914 trend period, due to rising living costs (*Process of Economic Growth*, Chapter VI). The more protracted lag of Western Europe is partly a consequence of the economic impact of the First World War and of the public policies and dominant social attitudes of the inter-war years.

influence than in the United States. In addition, Germany was more seriously tempted than the United States to translate industrial maturity into enlarged world power; and in the inherently oligopolistic circumstances of the European arena of power, this decision led to a greater relative enlargement of military expenditures in Europe as a whole than in pre-1914 United States.

During the 1920's Britain, in effect, took its favourable terms of trade in the form of chronic unemployment in the export industries. Only in the 1930's did a pervasive recovery occur. This phase did begin to exhibit a shift into the age of high mass consumption: suburban housing, automobiles, and durable consumers goods began to assert themselves more strongly as leading sectors. But rearmament and war postponed the immediate fruition of this trend.

Although the post-1920 terms of trade problem struck the Continent with less force than Britain, there too the return to relative prosperity, of 1925–29, did not move the economies far beyond pre-1914 patterns. France, on the whole, continued to stagnate down to the Second World War; and German recovery, while reflecting certain symptoms of the new phase, was dominated by rearmament.

Svennilson presents calculations of motor vehicle production (private and commercial) which suggest the relative movements of the United States and Western Europe between the wars. In 1929 the four major European nations (Great Britain, Germany, France, and Italy) produced 702,000 vehicles; the United States, 5.4 million. After a decade of protracted depression in the United States (marked by a compensatory turn to the welfare state), and a considerably greater degree of European recovery, the European figure was 1.1 million in 1938; the American, 2.5 million.[1]

In the decade 1946–56 the United States resumed a pattern of recovery and growth markedly similar to that of the 1920's: the migration to suburbia; and the extension of the automobile and the standard mix of durable consumers household gadgets to 75 per cent or more of American families. And, after an interval of post-war reconstruction, Western Europe resumed with force the similar but more laggard development of the 1930's. By the late 1950's Western European growth was based on the fact that this region had at last fully entered the age of durable consumers goods and services, experiencing a version of the American 1920's. The patterns of consumption, as among the various European countries, emerge as largely explicable in terms of income and price elasticities of demand.[2] And in Russia, as well, the inexorable attraction of the sewing machine, washing machine, refrigerator, and television was beginning to assert itself; and the first satellite town was under construction.[3] It was evident,

[1] Ingvar Svennilson, *Growth and Stagnation in the European Economy*, (United Nations, Geneva, 1954), pp. 144–52. I am inclined to believe that the length of the American depression and its intractibility in the 1930's stems from the character of leading sectors in the age of high mass consumption. The diffusion of single-family housing, the automobile, etc. requires expanding levels of private income and, in effect, full employment. Moreover, until the diffusion process is actively under way certain major forms of investment are likely to be slack, because of idle capacity. Full employment is needed, in a sense, to maintain full employment when the leading sectors are consumption sectors. This was not true before 1914 when, even with unemployment high and incomes low, it might well pay to press on with railroadization, steel ships, etc. where the high expected rate of return over costs derived primarily from lowered costs. Put another way, in the age of high mass consumption a higher proportion of investment becomes endogenous, rather than exogenous, when the latter term is used to embrace investment stimulated by new technological possibilities.

[2] See, notably, Milton Gilbert and Associates, *Comparative National Products and Price Levels* (OEEC, Paris, 1958).

[3] *Economic Survey of Europe in 1957* (United Nations, Geneva, 1958), pp. 14 and 22n.

however, from the pattern of future plans that the Soviet government was not yet prepared to give the vast hostages to fortune that follow a society's commitment to the mass automobile.

Beyond Consumption

While Western Europe (and to a degree, also, Japan) were entering the era of high mass consumption, and the Soviet Union was dallying on its fringes, an important new element entered the world economic system in the form of a quite unexpected tendency of birth rates to rise in rich societies.[1] Although the tendency can be observed in a number of countries, it is most marked in the United States. During the years of the Second World War the American birth rate rose from 18 to about 22 per 1000. This was judged at the time, and to a large degree it certainly was, a phenomenon of resumed full employment and early wartime marriages. In the post-war years, however, it moved up and has stayed at about 25 per 1000. An official forecast in 1946 estimated that the American population would reach 165 million in 1990; an official forecast of 1958 estimated that the figure might be of the order of 240 million by 1980.

The human motivations and social processes which have yielded this extraordinary result are not yet well understood; but Americans have behaved as if diminishing relative marginal utility set in to the expansion of real income along the old paths. They have opted at the margin for larger families; and this trend may be related to the high rate of expansion in family trips to national parks, motorboats, do-it-yourself implements, and, even, to a widely-noted tendency to turn away from the pursuit of income and authority within the large-scale bureaucratic establishments where a high proportion of the population do their work.[2]

Whatever the motivation, however, an expansion of population on this scale will set up requirements for the lateral extension of the society's resources, including its requirements of social overhead capital. These requirements in any case had been enlarged by the consequences of the previous phase of extension in automobile ownership and suburban housing[3]: there is a vast American backlog of investment to be carried out in roads and in the reconstruction of old depopulated urban centres. Finally, a quite significant change in the dependency ratio is under way. After falling for about a century, the number of persons under 20 and over 65 in the American population supported by each 100 members of the working force had reached 74 in 1935; by 1955 the figure was 81; and if present population patterns persist it is estimated that the figure will rise to 98 by 1975.[4]

The pattern of American economic growth over the next several decades is likely to differ, then, from that of either the 1920's or the 1946–56 decade; and it is likely to be based on somewhat different leading sectors. In any case, it is clear that American society, by its quiet collective decision about birth rates, has postponed the problems of a time of true affluence, when the full utilization of resources would not much matter.

[1] There have also been remarkable declines in birth rates in Japan and Italy in the 1950's, as new horizons of economic progress have opened up for large segments of the population.

[2] See, notably, Clyde Kluckhohn, 'Have There Been Discernible Shifts in American Values in the Past Generation?' in *The American Style*, ed. by E. E. Morison, (New York, 1958).

[3] See, notably, the calculations on social overhead requirements in *The Challenge to America: its Economic and Social Aspects*, Special Studies Project Report IV, Rockefeller Brothers Fund (New York, 1958).

[4] C. and I. B. Taeuber, *The Changing Population of the United States* (New York and London, 1958), p. 325.

The somewhat strenuous choice made by Americans as they pushed high mass consumption to a kind of logical conclusion, in the first decade after the Second World War, need not prove to be universal: the income elasticity of demand for children may vary. It is evident, however, that the march of compound interest is bringing some societies close to the point where the pursuit of food, shelter, clothing, as well as durable consumers goods and public and private services, may no longer dominate their lives. A new and revolutionary set of choices is being confronted, or is a mere generation or so over the horizon.

This is not to say that the richer societies are without challenge. There is the problem of escaping from a treacherous nuclear arms race. And there is the equal problem of organizing the planet, as the whole southern half of the globe and China move through the preconditions, into take-off, and regular growth. But the era when the problem and human agenda imposed by the fact of scarcity is coming towards an end: the day when, in Marx's phrase, labour 'has of itself become the prime necessity of life' is not all that far off, if nuclear destruction and the grosser forms of international disorder can be avoided.

A Comparison with Marxism

The analysis of stages of growth summarized here invites comparison with Marxism; for Marxism is also a theory of how societies came to build compound interest into their structures and of what then transpired. Marxism also begins with the impact on feudal (traditional) societies of the new discoveries and the expansion of trade; and it ends with communism—the stage beyond high mass consumption—when men need no longer work very hard for the material things they may want.

There are differences between the two systems at every point; but the most consequential difference centres on the assumptions made about human motivation. Marx derived several of his essential analytic tools from classical economics, as he interpreted it: a labour theory of value; an essentially Malthusian law of population and labour supply; and a version of diminishing returns, applied to the capital stock. But his most important derivation was the notion of treating human behaviour as an exercise in profit maximization.

The exact form of the function relating economic interest to non-economic behaviour varies in Marx' writings and in the subsequent Marxist literature. Much in the original texts—and virtually all the operational conclusions derived from them—depends on a view of the function as simple and direct as the dictum in the *Communist Manifesto* that capitalism 'left no other nexus between man and man than naked self-interest, than callous "cash payment" '. Elsewhere the function is developed in a more sophisticated form. Non-economic behaviour is seen as related not immediately and directly to economic self-interest but to the ideology and loyalties of class. Since, however, class interests and ideologies are presented as, essentially, a function of the techniques of production, and the social relationships arising from them, this indirect formulation yields much the same results as the more primitive statement of connexion. In the main stream of Marxist literature, from beginning to end, it is only in seeking, protecting, and enlarging property and income that men are really serious. Finally, there are a few passages in Marx—and more in Engels—which reveal a perception that human behaviour is affected by motives and objectives which need not be related to or converge with economic self-interest. This perception, if systematically elaborated, would have altered radically the whole flow of the Marxist argument and its conclusions.

It is at this point that my own analysis begins; for in the stages of growth human behaviour is seen not as an act of maximization, but as an act of balancing alternative and often conflicting independent human objectives in the face of the changing range of alternatives men perceive to be open to them. Men seek not merely economic advantage, but personal and national power as well; not merely adventure but security and continuity of social and cultural experience; not merely personal expression, but the joys of family, and a bit of fun down at the local.

Applied to societies, this innately paradoxical view of the human condition—a view which regards man as a complex household rather than a maximizing unit—does not yield rigid, inevitable stages of history. It leads to a succession of patterns of choice—varying in their balance—made within the framework permitted by the changing setting of society: a setting itself the product of both objective material conditions and of the prior choices made by men.

It follows directly from this view of how individuals act that the performance of societies is not uniquely determined by the locus of property ownership nor by the nature of production techniques. The sectors of society interact: cultural, social, and political forces, reflecting different facets of human aspiration, have their own authentic impact on the evolution of societies, including their economic evolution. They are not a superstructure derived from the economy. This view alters the specific stages of growth away from the Marxist pattern in quite particular ways.

First, the preconditions period is seen as a searching process of restructuring all dimensions of the traditional society, in which a reactive nationalism plays an important role; and decisions about the direction of national objectives which transcend material interests must be made before the take-off can get under way.

Second, neither in nor out of the market place is the power of the new property owners such as necessarily to deny the working force a share in expanding output once regular growth begins with the take-off; and the fact of progress, combined with urbanization, has generally set in motion a non-Malthusian decline in birth rates, tending to reinforce the rise in real wages.

Third, with the fact of regular progress in income, the income elasticity of demand comes into play as an independent force, altering the range of perceived alternatives, the pattern of effective demand, and the sectoral structure of the economy; whereas in Marxism the income elasticity of demand appears only in the perverse form of rising income from surplus value in the hands of a narrowing band of the bourgeoisie, capable of use which will only further distort the sectoral structure of the economy and hasten its ultimate crisis.

Fourth, in wider terms as well, the choices made by the society are determined by the existence of independently powerful political and social processes where effective influence is not weighted by property ownership; and, notably when maturity is reached, these areas of influence help determine how, and in what sequence, the resources of the mature economy will be used, including the possibility of a welfare state based on progressive taxation.

Fifth, the choices open to men when affluence is achieved appear to include but to transcend Marx's somewhat romantic vision of 'labour as a prime necessity of life'. There are, as suggested earlier, the possibilities of a population surge; outer space; boredom; an elevation of the quality of life; or the devil making work for idle hands.

The basic error in Marxism is, then, not a technical error in his economics; although such errors can be identified. In building on the western intellectual

and moral tradition he failed to perceive that the body of thought about society, of which classical economics was a part, was a spacious, complex, and essentially paradoxical creed. As Myrdal and Robbins have pointed out in this generation,[1] the individualist-utilitarian creed did, indeed, make the case for free competitive markets and for private property; but it also contained within its presuppositions the case for free elections, on a one-man-one-vote basis; for destroying or controlling monopolies; for social legislation which would set considerations of human welfare off against profit incentives; and, above all, for the progressive income tax.

In wrestling loyally with the dilemmas posed by the individualist-utilitarian creed, in finding balances that respected its conflicting imperatives, the societies of the West have thus made their way to the brink of communism without succumbing to Marx's prognosis.

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[1] G. Myrdal, *The Political Element in the Development of Economic Theory* (tr. from the German edition of 1932 by Paul Streeten) (London, 1953); L. Robbins, *The Theory of Economic Policy in English Classical Political Economy* (London, 1952).