International Differences in Income Levels: Reflections on Their Causes

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INTERNATIONAL DIFFERENCES IN INCOME LEVELS: REFLECTIONS ON THEIR CAUSES*

I. INTRODUCTION

Recent changes in the world scene have produced a feeling of greater involvement of all countries with each other, a keener interest in their diverse economic and social structures and functions. When events in a remote corner of the globe affect the lives and destinies of people thousands of miles away, we cannot easily retain the feelings of separateness and independence that may have characterized our thinking half a century ago. Concurrently, the closer linking of the world, in peace and in war, in international organization and in military conflict, has resulted in more information and in a greater effort to reduce the apparent qualitative differences in life around the globe to some comparable, measurable basis. The marked recent increase in quantitative data on population, health, food supply, industrial production, and income is in response to a natural urge to measure the similarities and differences in the social and economic structures of various nations; and to provide for national and international policy a more reliable basis than can be supplied by impressions of travelers, qualitative accounts of historians, or appraisals of geographers.

The increasing number of countries for which national income is estimated and the attention in recent years to international comparisons of income levels, are thus only one strand in the whole fabric of the study of the world framework of human society. This particular way of learning about mankind is still in its early stages. True, several international compilations and comparisons were made in the 19th century; and even, though on a much cruder basis, in the late 17th. But by current standards, the earlier compilations and comparisons have at most only suggestive value and are often misleading as indications of orders of magnitude. Even today, a critical examination reveals unreliability and inadequacy in a goodly portion of the current measures, which are so misleading in the impression of quantitative precision that any figure suggests. Unless civilization suffers a serious relapse, the comparisons we draw today may look as crude to scholars fifty or a hundred years from now as the 19th century comparisons look to us. We should bear this qualification in mind and not attribute too much significance to minor quantitative differences or draw unwarranted conclusions from the estimates. Even if we accept the qualifications, our interpretations may well prove superficial in the long run, chiefly because our accumulation of information concerning the various parts of world society is still in almost embryonic stage.

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Nevertheless, the data on income levels in various countries are already sufficient for at least a rough picture of the differences and of the associated social and economic characteristics. And there has been enough speculation and assertion about the causes of these differences to merit a review. The notes that follow are, as indicated by the subtitle, reflections on the theme--not results of a thorough analysis. But they may serve the useful purpose of stimulating further thinking on this important subject; and, possibly, of suggesting directions of further data collection and analysis that may prove fruitful.

II. A BRIEF STATISTICAL PICTURE

We begin our discussion with a brief statistical picture of international differences in income levels. More as a matter of convenience than because of the greater accuracy of the figures, I use here the compilation made by United States Department of State in laying the foundation for its Point Four Program. These figures have several advantages: they refer to a pre-war year (1939) relatively free of the disturbances and havoc of World War II; cover 53 countries which together account for about 85 per cent of the world's population; and provide data not only on income but also on various other characteristics. I have used the figures in the State Department report as given, supplementing them only by approximations to the shares of non-agricultural sectors.

The income figures are in US dollars, without correction for differences in purchasing power and minor conceptual dissimilarities. Since for many of the 53 countries the statistical basis for estimates is exceedingly thin, minor differences can be attributed little significance and the specific ranking of the countries is also to be disregarded. Only the major contrasts among the groups of countries are important for the present purposes. They can be summarized as follows:

(a) There are marked differences in per capital income levels among broad groups of countries. Even if the differences are exaggerated by peculiarities of income measurement (1) and we should reduce the income ratio from over 10 to 1 (groups I to III) to perhaps 6 to 1, the range of differences is still substantial. These differences are not just a matter of a single year or two, but characterize the long term income levels of the various countries.

(b) The figures for the 53 countries in the table relate to only 85 per cent of the world's population. The remainder (except the population of such countries as Spain, Portugal and Turkey which might fall in group II) would probably fall in group III, since it is for the economically less developed countries of the world that statistics are lacking. The exceptional position of group I, with about one-sixth of the world's population and over six-tenths of the world's income, would be even more conspicuous were it possible to include the rest of the world. The position of group III, with almost seven-tenths

(1) See the author's National Income and Industrial Structure, presented at the International Statistical Conferences at Washington, U.S.A., in September, 1947.

INTERNATIONAL DIFFERENCES IN PER CAPITA INCOME AND RELATED MEASURES, 53 COUNTRIES, 1939

	Groups of Countries by Per Capita Income				
	I	II	IIIa	IIIb	III
1. Per Capita Income (U.S.A.$)	461	154	86	31.5	41
2. Per cent of Total Population	20	16	11	53	64
3. Per cent of Total Income	64	18	6	12	18
4. Per Capita Income, Index	100	33	19	7	9
5. Average Population Type	1.1	1.5	2.8	3.0	2.9
6. Expectation of Life at Birth (Index)	100	82	..	..	63
7. Physicians per 1,000 Population (Index)	100	73	..	..	16
8. Per cent Literate (Index)	100	77	..	..	20
9. Per cent of Total Income from Non-Agricultural Industries	84	71	68	46	59
10. Average Income of Population Dependent on Agriculture (Index)	100	39	..	..	8
11. Investment in Industry per Worker (Index)	100	39	..	..	11
12. Energy Consumed per Day (Horsepower Hours per Capita, Index)	100	24	..	..	5
13. Miles of Railroads (Per 1,000 Square Miles of Area, Index)	100	72	..	..	32
14. Annual Freight Carried (Ton Miles per Capita, Index)	100	60	..	..	4
15. Daily Per Capita Food Supply (Indexes)					
All Foods (Calories)	100	92	..	..	72
Animal Proteins (oz.)	100	56	..	..	18
Fats (oz.)	100	57	..	..	32
16. Net Annual Consumption of Textiles (lbs. per capita, Index)	100	40	..	..	26

Notes to Table

All entries, except for line 9, from Point Four (U.S.Department of State, publication 3719, released January 1950, Appendix C, pp. 103-124).

Groups of countries distinguished in the columns of the table are by size of per capita income. The following countries, arranged in declining order of per capita income, are included in each group:

I (per capita income over $200): United States, Germany, United Kingdom, Switzerland, Sweden, Australia, New Zealand, Canada, Netherlands, Denmark, France, Norway, Belgium, Eire, Argentina.

II (per capita income from $101 through $200): Union of South Africa, Finland, Chile, Austria, U.S.S.R., Italy, Greece, Czechoslovakia, Hungary, Bulgaria.

IIIa (per capita income from $22 through $50): Haiti, Nicaragua, Guatemala, Bolivia, Honduras, El Salvador, Brazil, Ecuador, Paraguay, India, Phillipines, China, Indonesia.

All averages used in the table are, unless otherwise indicated, weighted arithmetic means. For entries other than income and population type data may be for fewer countries, especially in group III, then listed above.

Population types are identified as follows:

Type 1. Low growth potential. Birth rates below 25 per thousand. Low death rates. Small natural increase with prospect of relatively stationary population in the future.

Type 2. Transitional growth. Birth rates 25-35 per thousand. Both birth and death rates generally falling. Rapid population growth.

Type 3. High growth potential. Birth rates over 35 per thousand. Death rates (but not birth rates) generally declining. Rapid growth in absence of civil disturbance, famine, and epidemic.

The entries in line 5 are unweighted arithmetic means of entries for each country, given separately in the source.

Line 9 is based on data in National Income Statistics, 1938-47 and National Income Statistics, 1938-48, both published by the Statistical Office of the United Nations (in 1948 and 1950 respectively), supplemented for one or two countries by Colin Clark, Conditions of Economic Progress (London 1940). In general, the ratios are for 1939 or the year closest to it, within a decade either way. The entries are unweighted arithmetic means for 13 countries in group I, 8 in group II, 6 in group IIIa, and 5 in group IIIb. Weighting by total income for each country would have produced even more striking differences.

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of the world's population but only about one-fifth to one-quarter of the world's income would be similarly accentuated. (2)

(c) These differences measured by such a comprehensive monetary index as income per capita are corroborated by measures reflecting quantities of goods. The food supply per capita, especially if we deal with the more qualitatively select types, is in group III from one-third to one-fifth of that in group I; and the consumption of textiles per capita shows similar contrasts. Were data available on other consumers goods, more reflective of quality differences, the contrast would be even greater. In short, after allowances for roughness in measurement, real income levels per capita in group I (with one-sixth of the world's population) and in group III (with almost two thirds of the world's population) must still be in the ratio of about 6 to 1.

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(2) Colin Clark's data for 1924-35 in his Conditions of Economic Progress (London 1940) yield similar results.

(d) These differences in real income level are associated with different patterns of population growth. The high income level countries have, on the whole, a low growth potential (low birth and death rates); whereas countries in group III have high growth potentials. An increase in per capita income levels in any country is contingent upon a rate of growth in total output exceeding that of population, unless the latter can be reduced by emigration. It will be thus seen that the problem of raising the low per capita income levels in group III countries is aggravated by its high growth pattern of population. Another correlate is the degree of literacy of population--high in group I and low in group III, with group II in the middle.

(e) Differences in income level are also associated with differences in industrial structure, as revealed by the shares of non-agricultural industries in total income (line 9) and investment in industry per worker (line 11). Clearly the low income levels in countries in group III are connected with preponderance of agriculture in the economic structure, low levels of productivity in agriculture, low rates of industrial investment, low consumption of energy, and an undeveloped transportation system reflected in railroad mileage and freight carried. The opposites of the characteristics typify countries in group I. The list of characteristics of the national economies each viewed as a productive framework could be expanded, but the few given in the table are sufficient to indicate the major differences.

III. ASSOCIATION AND CAUSATION

In considering the factors that determine international differences in income levels of the magnitude just revealed, it is a natural tendency to treat the associated characteristics as at least in part causative. If this tendency is carried to its fullest extent, it can be said that income levels in countries in group III are low <u>because</u> the population follows the pattern of high birth rates and high death rates; or because the population is illiterate; or because agriculture, which tends to be a low income industry, is preponderant, and secondary and tertiary industries (to use Colin Clark's terminology) are unimportant; or because industrial investment per worker is low; etc. It also follows from these statements that the way to get a higher level of income per capita is to change the population pattern; or shift working population from agriculture into non-agricultural sectors; or increase industrial investment per capita. Indeed, much of the discussion of industrialization of underdeveloped countries smacks of such identification of associated characteristics with causal factors. (3)

There is undoubtedly some truth in this interpretation. A population with high birth and death rates is handicapped as a

(3) This is certainly the impression given by Colin Clark in <u>The Economics of 1960</u> (London 1944) and by Louis Bean in "International Industrialization and Per Capita Income," <u>Income and Wealth Studies, Vol. VIII</u> (National Bureau of Economic Research, New York 1946)--to mention but two authors.

body of economic producers, if only because high mortality, particularly concentrated in the infant ages, means an exceedingly wasteful pattern of life--with energies of parents devoted to raising children of whom only a few reach productive ages. It is equally obvious that an illiterate population is more handicapped than a literate one in developing productive skills. Likewise a larger stock of productive capital is a prerequisite of high productivity. Somewhat less obvious is the relevance of industrial structure, i.e., the preponderance of non-agricultural industries. That agricultural industries *per se* are no less productive than non-agricultural ones is, of course, evident from a comparison of agricultural productivity in the United States or in New Zealand with say, the productivity of labor in manufacturing in India or China. But one can argue that greater industrial *diversification*, which implies a smaller share in the national economy of any single group of industries such as agriculture, is a factor making for higher over-all productivity since it permits a more balanced use of technical advances in a variety of industrial sectors.

But even if the above arguments are granted, the significance of these factors as *causes* of international income differentials are still to be considered. Taken in and of themselves, out of the full context of all aspects of social and economic life, differences in birth- and death-rates would scarcely have much effect on per capita productivity; and this may also be true of literacy, especially when one considers how superficial its level is even in the economically advanced countries of the world. And one certainly can ask whether the approach to industrial structure suggested above and implicit in many writings on industrialization of underdeveloped countries does not put the cart before the horse; income is not high *because* a smaller share of the nation's economy is accounted for by agriculture and is not low because of the preponderance of agriculture, but in certain countries agriculture accounts for a smaller share *because* income is high and in other countries agriculture predominates because over-all productivity is low. The reduction in the share of agriculture accompanying a rise in over-all productivity is due partly to the permissive factor of a higher level of productivity in agriculture itself; and partly to the inducive factor that when the standard of living rises, human tastes are such that the proportion of agricultural products wanted declines and that of products of other industries rises. Quantitative proof of the former statement is supplied by the table where the contrast in productivity of population dependent on agriculture between countries in groups I and III is even greater than their contrast in per capita total income (compare lines 10 and 4). The second proposition, decline in the proportion of agricultural products wanted with rise in per capita income above a certain level, is demonstrated in any cross-section analysis of consumer budgets at a given point of time, where the proportion of income spent on food and clothing (the former particularly being an agricultural product) declines sharply as we pass from the low to the upper income groups.

What was just said of the industrial structure of the economy as a *consequence* of reaching certain over-all productivity levels, is also applicable to other characteristics. Literacy is perhaps as much, if not more, a consequence as it is a cause of high income levels; and the same is true of capital accumulation, industrial and otherwise. Population patterns with low

birth rates and low death rates, too, are just as much consequences of a higher standard of living and higher income levels as their cause. Certainly in the historical development of countries during the last 150-200 years the rise in over-all productivity came first, followed by reduced death and then with a substantial delay, birth rates, increased literacy, capital accumulation, etc.

Because of this interaction of income level and other characteristics, the statistical association between them is no basis for assuming that these characteristics are causative factors. The increasing emphasis on quantitative measurement in international comparisons naturally makes it easy to translate close statistical association into significant causal relationships. In view of the continuous interplay of income levels and these associated characteristics, in which the former rather than the latter is often the determining variable, this simple translation is a logical trap that should be avoided lest it lead to intellectual sterility and to a dangerously mechanistic approach to policy implications.

Two conclusions can, I believe, be safely drawn from the discussion so far. (i) Factors such as population growth pattern, literacy, industrial structure, and capital investment are of some importance in determining international differences in levels of income. But their importance, per se, is much more limited than their close statistical association with per capita suggests. Their net effect, if it could be measured, might account for but a small part of existing differences, and therefore leave much room for further search and explanation. (ii) These characteristics are associated with income levels, both as causes and consequences, and together, with many others not specifically indicated in the table, form an interrelated complex. All policy measures to raise per capita income levels are implicitly steps in producing the whole complex into being, and should be so viewed. They must, therefore, be conceived as measures designed to raise income levels, and to change population patterns, and to increase levels of literacy, and to permit a different industrial structure of the economy, etc. The realization of the extent to which per capita income level is only a symbol of a whole socio-economic complex of conditions is important for any intelligent policy approach, as well as for analysis of causes.

IV. 'NATURAL' FACTORS

Since mankind is part and parcel of a physical world, a biological species living in conditions provided by nature, it seems reasonable to ask whether economic differences among human societies are not reducible to differences in either natural environment or biological characteristics. The temptation to look for such 'natural' factors is great: if it were found that such factors beyond human control determine international differences in say income levels, the difficulty of disentangling the interrelated complex of economic and other social phenomena could be avoided. The finding of such 'natural' factors would also provide solace to minds and hearts of men who are perturbed by many aspects of human society but are reluctant to face or despair of the painful task of amelioration: if these troubles could be charged to inexorable nature (as they used to be charged to inscrutable ways of Divine Providence),

man could only bow to fate in the spirit of sadness and resignation.

Whatever the reasons, and some of them are warranted in the light of empirical observations, natural factors such as climate, topography, presumptive biological characteristics of particular groups of mankind (races, etc.) have appeared recurrently in attempts to explain international differences in political, social, and economic structures. On the surface, they also seem relevant to international differences in income levels. Without presuming to treat them adequately, we discuss them under two heads: (a) location-race factors; (b) irreproducible economic resources.

a) By location-race we mean factors represented by climatic-land aspects of the location of human societies, or by the presumptive biological characteristics of one human group as distinct from another. While differences in climatic and land conditions of various human societies are obvious and the so-called racial characteristics are subject to dispute and doubt, for purposes of discussion here, we take both for granted, and inquire whether they can be of significance in determining international differences in income levels.

The answer would seem to me largely in the negative, for two obvious but often neglected reasons. The first is the striking disparity in time between the location-race factors and their presumed consequences--international differences in economic performance. Climatic and land conditions at a given spot of the globe change exceedingly slow, on the scale of history of human society. Few significant changes in climate or state of the land have occurred within the five thousand years covered by the known historical stretch of human society (except those caused by man himself, in which case they are hardly 'natural' factors). Yet economic performance in many parts of the globe has changed rapidly. Indeed, only a few portions of the globe have not been, at some time, at least quite high on the relative scale of economic performance, if not in the vanguard. Certainly, China and India, now classified among the lower of the countries in group III, were in this category; and the same is true of some of the predecessors of the present Latin American republics. As historical knowledge increases, we find more examples of outstanding economic and social performance in the past in places far outside the present orbit of economic leadership. Of course, there may be areas on the globe where climatic and land conditions are forbiddingly difficult, e.g. in the Arctic Circle. But the contribution of these factors to the explanation of current, or even of past, international differences in income levels is obviously small.

Exactly the same argument applies to presumptive racial characteristics and differences. Even if we accept for purposes of discussion the dubious proposition that innate, biological differences exist among various sectors of mankind, the time span of these differences--because they are assumed to be innate and biological--is exceedingly long on the scale of human history. Yet no matter what racial, etc. groups have been identified during the known historical stretch of human society, each has at some time or other been among the economically advanced societies: the Mongol race during China's leadership; the American Indians during the Mayan and Incan civili-

zations; the Negro races in some of the Ethiopian, Egyptian, and Berber kingdoms; the Semitic races through much of human history. I do not feel competent to pursue this subject in detail, nor is such detail needed here. The time spans between the location-race factors and inter-spatial or inter-group differences in economic and social performance are obviously too great for the former to play a significant part as a determinant of the latter.

But granted this disparity, one may still contend that the location-race factors may be significant in that they effect genuine differences in natural conditions, thus limiting the adoption of methods by which high income are currently attained. To illustrate, assume that high levels are achieved only with the kind of exertion that is possible in temperate climates alone; or only by scientific endeavor, the capacity for which is claimed by some to be limited to the white races.

The speciousness of this argument is revealed by the second broad consideration that should lead us to deny much significance to location-race factors. Any historical distinctiveness in recent methods of attaining high income levels lies in the enormously increased power of man, developed by a diversified system of empirical science. Climatic and land conditions, as obstacles to human effort, are much less forbidding today than in the past; and the very growth of human technology means that location factors are less important today than they may have been in periods of more primitive technology. Likewise, the varieties of mental effort and capacity that go into the technology today are much greater than they may have been in the past, so that it is even more doubtful today than it was, that some presumptive differences in innate, biological characteristics of different groups of mankind significantly affect the acceptance and use of the diversified corpus of modern economic practices.

Dismissing the race factor as an empirically unestablished element and confining our attention to the obvious location differences in climatic and other conditions, we reach two conclusions. (i) Location factors, in the current and recent past state of technology and human knowledge, could not, in and of themselves, have contributed materially to international differences in income levels. Whatever difficulties natural conditions presented could, for the most part, presumably have been overcome by concentration upon the problem of human ingenuity and science. (ii) The natural conditions of many countries in group III are no more unfavorable to high income levels than those of many countries in group I. It would be difficult, for example, to demonstrate that nature *per se* is much less favorable in China than in Sweden or Australia; or that it is so much more favorable in England than in Mexico. At any rate, the burden of proof is upon the proponents of such theories; and no proof has been provided that takes full cognizance of the potentialities of human technology in dealing with even the most unfavorable aspects of land or climate.

b) The discussion above touched only implicitly upon a natural factor that is important in many analyses of international differences in economic performance--the supply of such irreproducible productive factors as cultivable land and minerals. Economic technology always, and modern economic technology is no exception, leans heavily upon extraction of certain

irreproducible resources from the earth; and it has been claimed that a poor supply of such resources, relative to existing population, is a major factor in explaining low per capita income levels, and a rich supply relative to existing population, high income levels.

This claimed dependence of international differences in economic performance upon the relative supply of irreproducible resources cannot be examined in great detail here. The reflections that follow lead to a somewhat more critical view of this dependence than usually prevails, and suggest the limitations of the hypothesis adopted.

i) 'Economic resource' is a concept relative to a given state of technology. Until man learned to use coal for heating a steam engine or smelting iron ore, it was a domestic consumer good but hardly an important industrial fuel. When man learns to grow his food in trays of synthetic chemicals, the importance of land as a resource for the production of food will dwindle. Examples abound of many hitherto important economic resources that have lost almost all importance, and of many formerly unimportant or valueless parts of the earth that have recently become exceedingly valuable. Even more telling are cases of relative scarcity in the past of some irreproducible resource, strategic within the framework of an older technology, that have been overcome not by finding more of the scarce resource but by a change in technology and substitution of a new resource, more plentiful and usually more effective. The conspicuous case, which in a sense laid the basis for modern economic technology, was the way the Industrial Revolution overcame the shortage of wood, as both fuel and industrial material, and of animal and wind power. More recent cases are the substitution of fixed nitrogen for natural guano and of synthetic for natural rubber. Hence, any emphasis on relative scarcity of irreproducible resources, as a factor in determining low levels of economic performance extending over a long period, must be countered with the question why no successful effort has been made by the victim of such scarcity to overcome it by changes in technology. To be retained, the hypothesis must, therefore, be rephrased: the have-not societies are poor because they have not succeeded in overcoming scarcity of natural resources by appropriate changes in technology, not because the scarcity of resources is an inexorable factor for which there is no remedy. And obviously human societies with low levels of economic performance are least able to overcome any scarcities of irreproducible resources by changes in technology; but this is a matter of social organization and not of bountiness or niggardliness of nature.

ii) Our knowledge of the supply of irreproducible economic resources is inadequate. This is true even of resources that, because of their strategic importance, have been investigated and explored most intensively--as the continuous upward revisions of world supply of petroleum clearly indicate. It is even more true of minerals that have not been as intensively explored; and may also be true of the oldest resource available, viz. cultivable land, the knowledge of whose chemical and other properties is a recent addition to the stock of scientific information. This limitation of data on irreproducible resources, data that can be amassed only by considerable effort and by application of technical skill and knowledge--all scarce in the underdeveloped countries--is, unfortunately, greater for these countries, so that shortage biases are likely to be greatest for just the

countries with low income levels. It follows that all our current estimates of the supply of irreproducible economic resources are slanted to minimize the supply in countries in groups II and III compared with the estimates for the developed countries in group I.

iii) The irreproducible economic resources that do exist in the countries with low income levels are not used as effectively as those in countries with higher income levels. Statistical support for this statement is readily available, ranging from measures of yield per acre of land for agricultural crops to comparisons of the rate of extraction of mineral resources with their estimated deposits. We cite one illustration, of interest because of its broad coverage. Recently, Professor A. P. Usher prepared estimates of world resources of mechanical energy (represented by reserves of oil, coal, and water power) as well as world output of such energy (extraction for minerals and production for water power). (4) From these estimates, largely for 1939, the proportionate shares of countries in groups I, II, and III were calculated, after allocating roughly the countries not included in our table but covered by Professor Usher to group III (except for Turkey, Spain, Portugal, and Rhodesia which were placed in group II). Countries in group I accounted for 44 per cent of total world stock of mechanical energy resources; in group II for 19 per cent; and in group III for 37 per cent. The index of per capita stock of energy resources was, therefore, measured by about 2.5 in group I; 1.25 in group II; and 0.5 in group III. The contrast in relative supply between groups I and III is thus measured by a ratio of 5 to 1.

But the range in energy consumed per day per capita between groups I and III is much wider than that--about 20 to 1 (see table above, line 12). Moreover, Professor Usher's data indicate that in terms of production of mechanical energy resources (extraction, not use) group I accounts for 73 per cent of the world total, group II for 12, and group III for only 15 per cent. That production by countries in group I of 73 per cent of the current supply, with a resources share of only 44 per cent, indicates that their rate of extraction relative to stock is much greater than in the world at large. It would, of course, be theoretically just as possible for countries in group III to extract their irreproducible resources at a greater rate than the world at large, i.e., they could compensate for a smaller supply by drawing upon it at a faster rate. Yet their extraction rate is much lower--an indication that under existing circumstances and for some time to come an absolute shortage of irreproducible resources is not a limiting factor. (5)

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(4) See his summary in "The Resource Requirements of an Industrial Economy," The Tasks of Economic History, 1947 Supplement to the Journal of Economic History, N.Y. 1948, pp.35-46.

(5) It is somewhat misleading to deal with all countries in group III (or groups II and I) as a unit, since within each group, energy resources are unevenly distributed among the individual countries. But the general tenor of the argument would remain the same were we to deal with individual countries (e.g., China and India); and so long as the statements made in the text are not literally translated as ap-

iv) Finally, many industries and economic activities do not need irreproducible natural resources; and if they are needed, a country with a scarce supply can presumably secure them in trade, given a minimum network of international economic relations. England developed a flourishing cotton textile industry, without possessing the basic natural conditions for producing the raw material; and the same is true of the rubber product industries of the economically advanced countries of the world. To claim strategic significance for the relative supply of irreproducible resources is unwarranted, so long as many industries do not need them; and so long as international trading relations permit one country to compensate for shortage in irreproducible resources by specialization in other sectors of economic production.

All these arguments should not be interpreted as denying that under given conditions of technology, the possession of a large stock of natural resources by a country is an economic advantage; and the complete absence of such resources a disadvantage. They are intended to suggest only that, in explaining a long term international differences in levels of income, the relative supply of irreproducible resources is not a dominating factor; that our data on the presumptive relative scarcity of such resources in the underdeveloped countries are faulty to the point of being misleading; that in fact countries in group III fail, by a wide margin, to utilize the stock of resources which they do possess; and that, after full allowance for this factor is made, there is still a wide range of international differences in income levels to be explained. (6)

V. THE FACTOR OF SIZE

International comparisons are almost always in terms of the existing nation-states that differ widely in size, whether size is in terms of area, population, or some economic magnitude. Thus the list of 53 states distinguished in the data underlying the table, includes huge units like India and China, each with over 350 million of population; and relatively small units like New Zealand and El Salvador, with less than 2 million each. Is the mere factor of size important in determining levels of economic performance per capita?

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plying to every single country in group III (or in the other groups), no harm is done.

(6) Specific figures in Professor Usher's tables suggest that the supply of irreproducible resources in many smaller countries in group III accounts for an income level higher than it would otherwise have been. In many the fortunate existence of deposits of strategic raw materials (particularly petroleum) results in an active interest of firms from industrially advanced countries and in a higher level of national income than would otherwise be the case. Most common references to shortages of natural resources are to those of coal and iron. But a fairly high level of income can be attained without them, if only peaceful economic life is considered; and as a general rule, most of the large countries in group III have such resources but fail to utilize them at sufficiently high rates.

The question implies that even with international trade and other flows across boundaries, the existence of a separate state organization means at least partial isolation of the economic complex, barriers to an easy flow of goods and resources. Even if we assumed a world of free trade and free movement of capital and people, the several states, with their different languages and historical and cultural traditions are societies that think of themselves as different and separate from each other; and economic flows among them, even in the absence of legal restrictions, would not be easy because of these barriers of language and different historical antecedents. If we add the realistic consideration of barriers to migration either of men or of capital and the various impediments in the way of a free flow of goods that are in fact created by a separatist state organization, we must conclude that the state structure does result in separate units, whose existence, because of the obstacles to free economic flow that they impose, may be an important factor in determining differences in overall economic productivity.

This inference as to the possible importance of size of state in producing inter-state differences in levels of economic performance is reenforced by somewhat more specific arguments. First, some industries associated with modern technology require a minimum size of market to warrant the application of efficient methods of mass production. In such industries, e.g., iron and steel, aluminum, automobiles, shipbuilding, etc., the scale of units is quite large. For a country with a small population and a correspondingly small domestic market, such industries are feasible only if they can count, in the long run, on relatively free access to markets outside their country's boundaries. Under existing and even past conditions of the world, such access is precarious. It follows that countries below a certain minimum size cannot develop such industries (except sometimes at extra cost), and take advantage of some of the more advanced methods of economic production.

Second, some industries must locate within a country's boundaries, since no substitution for their products by imports is feasible. This is obviously true of the industry represented by the state itself, and of industries rooted in the country's area and population (e.g., educational and other services, the construction industry, and the like). If we add the need for other domestically located industries induced by a desire to be independent of unreliable sources outside (particularly in case of disruption of normal channels of international intercourse), it is clear that a minimum complex of industries must be maintained within the state, and will be maintained regardless of size (excluding splinter units like Monaco or Luxemburg). But if the state has a small population, the need for a diverse industrial structure may well lead to uneconomic scale of operation in many industries--even when the latter, unlike the giants of the type discussed in the preceding paragraph, have an absolutely low optimum scale of operation.

On the other hand, a small state may enjoy some advantages. It is easier for a small than for a large state to find a favorable position in the interstices of international economy. It is easier for a Norway, a Denmark, or a Switzerland, by taking advantage of some of its resources, to attain a high level of income per capita than it would be for a bigger state unit, say

of the population dimensions of Italy, let alone a huge one like China. Also, it may be easier for a small state to achieve the degree of internal unity and cohesion of the population which so facilitates economic progress and prevents sharp internal conflicts from developing. On general grounds, one cannot assert that, given a relatively peaceful state of international relations, the balance of advantages is definitely against the small and in favor of the larger state unit. Such a negative conclusion would certainly be safe if we excluded the extreme ranges in size--the tiny units in which the basis for economic independence is almost completely absent, and the huge units in which the problem of economic and social organization is of grave magnitude indeed.

In the light of this discussion, we can look at the figures and see what they suggest. For the 53 countries covered in the table the level of per capita income can be correlated with the size of the country as measured by its population. The coefficient of rank correlation (used to avoid the assumption of normality in the distribution of units by size or by per capita income),(7) calculated for all 53 countries is +0.18, indicating some positive association between level of per capita income and population size; but not large enough to be significant. However, if we exclude India and China, where huge population masses are associated with very low per capita incomes, the coefficient rises to +0.30, a value which for the 51 countries is statistically significant. If we could include more state units, the positive correlation might be even closer, because most of the additional units would be both small and characterized by low levels of per capita income.

There is thus some statistical evidence for states below the line of huge population units of a positive association between per capita income levels and size. In general, the larger the state, the higher its per capita income. But the association is far from close. Even as a purely statistical result, it may be shaky: there are altogether too many notable exceptions. While the factor of size in and of itself may contribute to international differences in income levels, at the present stage of our knowledge and analysis, no great weight can be attributed to it.

However, the importance of size as a factor may well be increasing. For the growing cleavage among states in the world today may mean that the disadvantages of small size may be sharply and catastrophically increasing. Indeed, within the orbit of the USSR these disadvantages are so great that small states as separate entities are fast disappearing. Where they remain, the restrictions on normal international economic intercourse may mean a serious deterioration in the relative position of small states, which may be only partially counteracted by already observable efforts to merge them--for some purposes--into larger units.

VI. A HISTORICAL VIEW

The limitations of the analysis developed so far, and the meagerness of its contribution to the explanation of interna-

(7) The formula used is $1-6(\text{Sum of } d^2)/n(n^2-1)$, where d is the difference in ranks, and n the number of pairs of items in the comparison.

tional differences in income levels, may well be due to the author's ignorance or prejudice. But it may also result from the restriction of the analysis to cross-section association of income levels with other variables; and hence to its neglect of the historical antecedents of these levels. All the units whose economic performance we are comparing for a given year or decade are results of a long process of historical development; and our comparison is thus a cross-section in the stream of historical change, with divergent trends and different levels at whatever point we start tracing these trends. The question to which we seek the answer might be illuminated if we view the broad trends in historical development of which the current income levels are the outcome. Such a view, while necessarily superficial, may lead to certain broad conclusions that would provide at least a framework for a potentially more fruitful inquiry into the problem.

The suggestions yielded by such a broad historical view are stated seriatim without any effort at detailed documentation.

a) First, the range of international differences in income levels must be much wider today than it was say 150 to 200 years ago. This impression cannot be corroborated statistically, since our measures do not reach that far back; but its plausibility follows from the current figures. In countries in group III per capita income levels are close to minimum subsistence and it is clear that it would have been physically impossible for past income levels to be a fraction of the current levels in any country in group III. By contrast, per capita levels in countries in group I are far and above any minimum subsistence and the more developed countries in the past (not necessarily those that are now in group I) could well have had income levels that are fractions of those now prevailing in group I. We know, in fact, that in the countries in group I the past century to a century and a half were marked by rapid growth in income per capita. And it is plausible to assume that the low per capita incomes in countries in group III are not due to an absolute decline of income levels during the last century or two; or that whatever secular decline in real per capita income occurred was relatively small. We can thus infer that the range in per capita income levels was much narrower about two centuries ago than it is today. To illustrate: if in countries in group III (allowing for the shift in identity) per capita levels two centuries ago were at the lowest say 50 per cent of the present, about $20, and if in countries in group I (again allowing for shift in identity) per capita levels were say one-seventh of the present, $65, the range narrows from over 10 to 1 to about 3 to 1. The narrowing of range in fact may well have been greater than in this illustration.

To put it differently, much of the current international spread in income levels is due to diversities among countries in the rate of growth of per capita income during the last 150 to 200 years: in some countries per capita income grew quite rapidly, in others very slowly if at all. Therefore, from a starting point of more equal levels, marked inequalities in per capita income have developed. Hence, current international differences in per capita income may be due in large part to diversities in the rate of growth of per capita income during the past two centuries. What factors induced and permitted some

countries to attain a high rate of growth in per capita income, and why where the same or similar factors not operative in other countries?

b) The use of a span of one and a half to two centuries in the preceding section is not an accident: history suggests that the factors that operated in some countries and not in others are those associated with the 'industrial system'--a concept used to designate a wide application of knowledge, based on empirical science, to the problem of economic and social technology. It is the adoption of the industrial system, combined with certain social and political concomitants, that is at the basis of the rapid growth of per capita income in some countries. And the industrial system dates from one and a half to two centuries ago.

It is important to emphasize here that, given an organization of the world into separate and competing states, there is bound to be inequality in the rate of spread of any new type of economic and social mode of life; and, consequently, inequality in levels of economic performance among countries. If a new economic system is ushered in, it certainly will not be 'invented' and adopted simultaneously in all the countries of the world: such simultaneity could be attained only by some planned imposition of the change by a single world authority. The new type of economy, the secular innovation, will necessarily arise first in one or two countries in which historical antecedents and pressures combine to break through the crust of the existing economic and social habits toward a new and more productive mode of operation. Given this limitation of the origin of a secular innovation to one or a few countries, and its slow spread to others; given the significance of the secular innovation as a basis for a higher per capita income, it follows that its gradual spread across the face of the globe means at any given time differences in income levels among various countries--associated with the degree to which these countries have adopted the new and more productive mode of operation.

Economic history of the longer lived human societies provides several examples of this process of initial limited impact and then gradual, uneven spread of secular innovations. The successive effects of the discovery of the new world, as they filtered through first the pioneer explorer countries of Western Europe and then the others, is one conspicuous example. The spread of the system associated with the medieval town economy is another. In this sense, the originally limited impact of the industrial system (marked by 'Industrial Revolution' in England) and its gradual and uneven spread to other countries, is only another example of the introduction of a secular innovation in a world organized in competing states.

c) To repeat, the industrial system is the application of empirical science to basic and ever increasing areas of economic and social technology. That it is the basis of high levels of economic performance in countries in group I can be seen easily by comparing their industrial structure and mode of operation with those in countries in group III. In countries in group I many industries have developed whose basis is some recent scientific discovery (ranging from steam and steel to electricity, internal combustion engines, electronic communications, and atomic power as the most recent example), whereas in coun-

tries in group III they are, on the whole, either completely absent or present in minuscule amounts. Furthermore, the technical procedures used in the oldest industries, e.g. agriculture and construction, in the more advanced industrial countries utilize, to a much greater extent than in the countries in group III, the contributions of the empirical and rational approach that is the hallmark of modern science.

The feasibility of using the results of modern science and empirical knowledge in economic production is not merely a matter of availability of a stock of discoveries contributed by original workers or practically minded adapters. Let us disregard for the moment the importance of social and economic organization as a precondition for adoption on a wide scale of the contributions of science to economic technology. A minimum of cultural adaptation is still required, regardless of the economic and political organization of society. Widespread use of scientific technology is impossible without a literate population, and a society whose general outlook has not been sufficiently secularized to place a high value on rational calculation and material welfare. The very development of science, and the effective application of its results, requires a cultural milieu in which existing values do not impede an open-minded view on nature, a dispassionate consideration of empirical findings, and a strong desire to enhance the material welfare of man. It is hardly accidental that the growth and spread of science in the modern world was accompanied by and closely tied to broad secularization of those societies that led in the development; and that widespread application of science required and was accompanied by a shift in the general outlook of ever growing proportions of the population toward an acceptance of rational calculation, toward greater habituation to a life governed by the conventions of scientific measurement. Clearly, the development of science and widespread application of its results would have been impossible in the early Middle Ages in Western Europe, with an illiterate population, dominated by religious tenets and emphasis on the hereafter, completely unaccustomed to living by the clock and by rule, and reconciled to a status view of life where traditional patterns of economic procedure and behavior seemed hallowed by inviolable precepts of religious origin.

Whether under a system of private enterprise of communistic organization of the economy, of political democracy or authoritarian state, the adoption of an industrial system is thus not merely a matter of having a stock of scientific knowledge embodied in books or pamphlets; or even of the physical embodiment of such knowledge in machines and plants. Its effective use involves as a minimum an adaptation of the culture and mores of the population. Part of this adaptation we have already observed in discussing the relation between high income levels, literacy, and population type 1 (the latter reflecting a more rational approach to family life). But it has many more ramifications, most of which cannot be put into quantitative terms. Obviously, a change in cultural milieu, when needed for an effective adoption of the industrial system, may well be a slower and more painful process than the accumulation of savings and capital, or other material prerequisites of a higher level of economic performance.

d) The successful adoption of the industrial system, re-

sulting in high levels of per capita income, has been limited, in fact, to countries that combined with it private enterprise as the main unit of economic organization and the democratic state as the dominating form of political organization. In all 15 countries in group I (except possibly Argentina, which is the lowest on the list, and even there the greatest development was under the aegis of private enterprise and political democracy), private enterprise was the main engine in introducing changes associated with the industrial system; and during the periods of rapid growth that brought them to high income levels, the state was a democratic organization. In fact, all of them are deep in the long standing tradition of Western European development, part and parcel of the historical milieu out of which science and rational thinking, freedom of economic enterprise, and political democracy, grew. It is dangerous to assume that this association of rapid growth in income levels with free enterprise and political democracy was an historical accident.

Of course, the association is not hard and fast. Some countries in the same tradition and with the same antecedents, like Italy, Austria, and Czechoslovakia, failed to reach the levels of group I. And, more important, because such an association existed in the past, it does not necessarily follow that an effective adoption of the industrial system as a base of economic organization requires free enterprise and political democracy. At any rate, the communist states of today proceed on a different premise: they assume that a more effective adoption of the industrial system is possible in combination with enterprise controlled by the state and an authoritarian structure of that state (I am disregarding the misuse of the term 'democracy' in its application to states that have no free press, no free political parties, and none of the other basic characteristics of democracy). But history, while naturally subject to bias, leaves one with the distinct impression that a heavy burden of proof lies on those who think that an effective adoption of the industrial system is possible without free private enterprise and political democracy, granted the possible initial role of the state as aider and abettor. Certainly, the experience of those countries in the past that did introduce the industrial system with but an inadequate provision for freedom of enterprise and political democracy (Japan, and somewhat less so, Germany) is not encouraging. Their record, when viewed in the large, necessarily including the results of wars that could not be avoided precisely because of the failure to eradicate authoritarian and feudal elements from the past, is hardly indicative of a successful attainment of high income levels in the long run. However, we are on highly problematical grounds, and should perhaps only stress the connection in the past between effective adoption of the industrial system and freedom of private enterprise and political democracy; and ask whether this connection is indispensable, i.e. whether without it the use of the industrial system to raise the long term levels of per capita income would be much less effective. (8)

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(8) Many aspects of the interrelation between an effective adoption of the industrial system and private enterprise-political democracy, argue for its indissolubility. The drive for profit and personal gain that animates economy under private enterprise; the supremacy of the consumer

VII. OBSTACLES TO THE SPREAD OF THE INDUSTRIAL SYSTEM

In so far as high income levels result from a rapid rate of growth in income per capita associated with the adoption of the industrial system, the range in current international differences is partly a function of the slowness with which the industrial system spread over the face of the globe. A rapid spread, say, in a decade or two, would bring a generally high level of income per capita and a much narrower range of differences in income level among countries. Because over some two centuries, the spread of the industrial system was limited to a small portion of mankind and because so many countries have as yet failed to take full advantage of it, the low income levels for most of the world and the high levels in countries in group I are in marked contrast. What are the obstacles to the adoption of the industrial system that may account for its slow spread, and thus partly account for the existing differences in per capita income levels among various countries?

a) One is tempted to think of the stock of technical knowledge as a free resource, fully available to all countries; of the contribution of science and empirical study as a universal possession of mankind. In a sense it is: most of it is overt and open to study and adoption by anyone. But this impression of universal availability of technical knowledge is partly an illusion. Scientific discoveries, and particularly their practical counterparts in inventions and technical improvements, are often the solution to a specific problem in a specific country adapted to the resources it possesses. The major technical changes at the core of the Industrial Revolution in England were partly colored by conditions in that country. The agricultural revolution of the 18th century, with its introduction of continuous crop rotation, scientific livestock breeding, and another wave of enclosures represented adaptations of already known advanced practices to conditions of British agriculture. It is not clear that these technical changes would have been as valuable, or as relevant, to the type of intensive agriculture followed in China in the 18th and 19th centuries. The adaptation of coal in the Industrial Revolution in England to serve as the major fuel in iron smelting was a technical change eminently suited to British needs, with the country's abundant supply of coal. But it could not be directly useful to a country in which the main supply of energy is water power. And passing to less basic types of technical change, the series of inventions and improvements that went into organizing the United States methods of mass production (standardi-

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in a political democracy; the fostering of the spirit of inquiry and critical examination of evidence--are all powerful means of breaking resistance to change; encouraging extensive application of knowledge; and building industrial society on the lasting and solid base of a high standard of living of ultimate consumers. In contrast, the recent experiments in grafting the industrial system to a society deprived of personal freedom and with the ultimate consumers' needs forcefully subordinated to state imposed goals, seem much less effective--particularly as bases for peaceful economic growth for the long run.

zation, analysis of work tasks, continuous conveyor and assembly belts, plant organization, etc.) were obviously geared to large scale plants well adapted to the huge domestic market--and not as easily adapted to smaller countries, even of the size of Great Britain.

Since inventions and technical changes bear the specific stamp of the originating country, their use by other countries is not a matter of taking over by direct imitation but of modification and adaptation. The magnitude of this modification may vary widely, from one type of technical change to another and from one country to another. But where it is required, sufficient will and talent are needed in the follower country--whenever such capacity and talent cannot be imported--and it cannot always be imported--from the originating, leader country. The slow spread of the industrial system is thus, in part, due to difficulties involved in modifying the original technical change to fit different conditions.

The important implication of this observation is that the spread of modern industrial technology outward from its originating country most easily reaches such other countries as have either similar material conditions, or are closely associated by social and cultural antecedents. It is hardly an accident that so many of the countries in group I have close ties, blood or culture, with England, the leader of the industrial system. Australia, New Zealand, Eire and Canada are certainly in this category; the United States bears a strong imprint of its original association with England; and a fair number of the European countries in group I are within the orbit of British economic influence (Denmark, and less so, other Scandinavian, countries). In all these cases, connection with the originators of the industrial system was sufficient to provide, often on the spot, the talent necessary for the technical modification of the English industrial system.

b) Another reason for the slow spread of the industrial system may be the fact that in this competitive world, the pioneer countries use their economic superiority to impede growth elsewhere. The dynamics of economic and social growth in a world organized in competing states are such that success within a country often results in attempts to extend influence and domination elsewhere. The aggressiveness of Western Europe through the centuries of its growth is an old story, and need not be rehashed. It is clear that the advance of the industrial pioneering countries was accompanied by impacts upon the rest of the world that partly corroded and distorted the then current economic and social organization; and frequently resulted in political subjugation, hardly a favorable condition in the politically inferior countries for a rapid adoption of the industrial system. The story of imperialistic domination over countries in Asia, Africa, and Latin America is all in point. While such domination had some economic advantages, it certainly served to block the way to a concerted effort on the part of the dominated countries toward adoption of the industrial system. This is not to say that, free of foreign control, they would have seriously attempted to or succeeded in adopting the industrial system and laying the foundation for higher levels of economic performance. All that is meant here that even if there were forces in these countries bent upon such attempts, necessary political independence had first to be acquired. And,

in some cases, the very effort to secure political independence in turn strengthened forces in the country that in the long run were inimical to the effective adoption of the industrial system (vide the case of Japan).

c) But the most serious obstacle to the rapid spread of the industrial system is one that it shares with many major innovations: it means a marked break in established patterns of social and economic life; it destroys established interests; it requires a system of social values and a cultural milieu quite different from those that are the heritage of a long historical past in many countries. In short, it is a thoroughgoing revolution, in the full sense of the word. And revolutions are neither easily made, nor successful without long preparation.

Industrialization and economic change in the major countries that went through it successfully engendered painful dislocations, and the long preparation of the cultural and social milieu (as well as some happy historical accidents) accounted in large part for a relatively successful solution of the difficulties. Especially in countries with a rich historical heritage, this impression of industrialization as a process of destruction, as well as of creation, is particularly strong. In England, in Germany, in other European countries adoption of the industrial system meant dislocation of the peasant off the land; the destruction of the artisan; the reduction in importance of the landed nobility; and a change in social values that was painful to many groups who lived by the old traditions. Only in the new, relatively 'empty' areas to which European immigrants brought their training and skills, but not the full force of historical tradition and the rigidities of class structure, was the process less painful. But even here it meant the destruction of the aborigines; and in the United States, a civil war had to be fought before agreement was reached on the adoption of the industrial system with all its social and other concomitants.

The slowness of the spread of the industrial system is then the slowness with which, in old human societies with established traditions and social values, and entrenched class interests, a new class is formed which views the industrial system as its ideal; which is willing to exercise pressure for the social changes requisite for the introduction of the system; and which becomes powerful enough to impose its interests, considered by it identical with the interests of society at large, upon the country. That this is far from an easy task, and that conditions favorable for the formation of such a class are not common, is evident after only a brief glance at the social structure and history of many of the countries now in groups III and II.

If, in addition, free enterprise and political democracy are considered to be prerequisites and necessary accompaniment to the successful adoption of the industrial system, the obstacles imposed by historical heritage over the major parts of the globe become only the more obvious. Nor is it surprising that the countries with the oldest historical background, with the highest attainments in the past of economic and social performance within the old framework of technology and cultural values, are the ones in which the difficulties of a revolutionary transition to the new mode of life are the greatest. China

and India are conspicuous illustrations, although other factors contribute to the extreme difficulty of adopting an industrial system evolved by and geared for countries of a size and material conditions so vastly different from these Asiatic agricultural empires.

d) The statements above do not mean that in countries in group III (or group II) avenues toward an increase in per capita income levels are few or completely barred. On the contrary, any country at any time, even the group I countries, can find various feasible ways to raise their income levels. For example, in China the rebuilding and extension of the inadequate railroad network; the reorganization of the property framework of agriculture; the establishment of an honest government administration; the application of relatively small amounts of technical skill and knowledge; and a vigorous campaign for limitation of family size--would go quite a way towards increasing per capita income. Similar observations, perhaps with different specific contents, could be made concerning most countries in group III. All that the arguments suggest is that the attainment by countries in group III of a per capita income level at all approaching those in group I is a process that requires a thoroughgoing revolutionary change in economic and social structure, in the cultural complex, and possibly a series of technological innovations so large as to be neither easily nor promptly securable.

One implication of these obstacles should be stressed. The spread of the industrial system is often assumed to be a process that will take its inexorable course in due time--like a slowly moving glacier whose course cannot be stopped or avoided. In the light of history such a picture is largely an illusion. True, some of the elements in the industrial system are likely to spread to all parts of the globe: e.g. the more important technological artifacts, like railroads, automobiles, electric power stations, etc. will find their way eventually, even if in moderate quantities, wherever there is room for them. But it is quite possible that for centuries to come these and other products of industrial civilization will be available in many countries in amounts far smaller relatively than they are now available in group I countries, and that the elements of the industrial system will constitute but small islands in the sea of a pre-industrial economy in many countries of the world. If by an industrial system we mean the full and effective utilization of the potentialities of empirical knowledge and science in economic production, even of the imperfect type now realized in countries in group I, its spread to all or even most countries of the globe is far from inevitable. For it is quite possible that many countries will not have the spearheading group, with sufficient power to break the crust of historical heritage, and to evolve the forms of adaptation of the industrial system necessary for the relatively effective utilization of its potentials.

History provides several examples of secular innovations which have run their course without penetrating into or significantly affecting all countries, even those close to the origin of the innovation. The feudal system was a well nigh general institution in medieval Europe, and yet the Italian peninsula was not fully dominated by it. The idea of political democracy is over two centuries old at least, and its application in

Western Europe over a century and a half old; but Spain and Portugal never had it to any significant extent, and never shifted to a system of social values free from the domination of religion. Yet these countries were geographically near the locus of the secular innovations in question. True, with the growth in power of transportation and communication, the world has become a smaller unit. But by the same token, the world as a whole is a more greatly diversified complex than just Western Europe, a complex whose parts bear the deep impress of different series of historical experiences and antecedents. That a universal spread of the industrial system, in a relatively efficient form, to all these historically different parts of the globe is an inevitable process, is highly problematical. The assumption that it is, just as the assumption of the inevitability of human progress, may well be a misconception that originated in the rationalistic theory of the 18th century and was reenforced in the 19th by the impressions made upon Western thinkers by the remarkable economic and social progress in countries directly within the field of their vision.

VIII. SOME IMPLICATIONS

The task of inference from the variety of historical experience is difficult at best; and it is particularly difficult and treacherous when attempted without detailed documentation and thorough data. The suggestions advanced here concerning the historical bases of international differences in income levels are but general impressions, which may well be, and probably are, colored by the author's personal judgments. They are, to repeat the warning made at the outset, merely reflections on the problem. But it is hoped that these reflections have some foundation in recorded data and facts; and that they will, therefore, at least provoke serious thought in directions that have heretofore been little emphasized in the statistical literature.

If these reflections are of some validity, they have a variety of implications, for both policy and further research. The implications for policy neither need nor can be discussed here in detail. We mention only the most obvious--that attempts at raising economic levels in countries that have so far failed to take advantage of the potentials of an industrial system are not merely a matter of adding a few plants (which without the necessary background are merely junk piles of brick and steel), and not merely of importing a few technical experts who are more than likely to be ignorant of the history and institutional background of the country. It is more a matter of finding within the country whatever groups among its population are aware of the need for and the ways in which elements of the industrial system can be adopted; and of mobilizing support behind these groups in the difficult effort which they will necessarily face. Above all, considerations of policy action must be made in full cognizance of the social and cultural corollaries of higher levels of economic performance, and of the implicit destruction of long standing and entrenched interests and attitudes which the adoption of these corollaries threatens.

But I am not competent nor in a position to examine the policy implications adequately. My interest lies more in the suggestions for further study--which are, in a sense, the raison d'être of this whole discussion. The suggestion can be

put briefly: instead of confining ourselves to mechanistic, cross-section comparisons of quantitative indexes, let us pay adequate attention to the historical trends which cumulate in the kind of international differences in income levels that we currently observe. All that has been said concerning these trends in explaining existing differences was in the nature of suggestions based on what little one can learn. It is more important as an indication of directions and questions around which further and more thorough inquiry into the processes of economic growth of nations can be built.

This inquiry into economic growth in various countries would utilize quantitative data on secular changes in population, national income and its structure, many of the components ordinarily distinguished in studies of national income and wealth, foreign trade and investment, and a host of other aspects of economic and social structure. But the inquiry cannot, and should not, be limited to quantitative data alone, even apart of the difficulties to be encountered with the scanty supply of such data for most countries. The historical heritage of the several countries as embodied in patterns and values dominating social behavior, their political structure, and their attempts, successful and otherwise, to adopt the elements of the industrial system to conditions of their country, would all have to be examined. Much of the raw material for a systematic inquiry of this type lies in historical monographs and studies; much is still buried in the primary historical materials; and much may be lost beyond recovery. More significant, a proper analysis of data of this kind, in conjunction with quantitative data, would impose upon the scholar problems for which the tools of his particular discipline--whether it be economics, political science, sociology, anthropology, statistics--may not be adequate. And much of the effort spent in this direction may yield primitive and limited results, at least at first.

We cannot be too optimistic that this, or other similar, inquiries will establish some invariant pattern of economic growth of nations; or succeed in clearly distinguishing between the necessary and accidental conditions of the effective adoption of the industrial system. Indeed, one must beware of premature generalizations because of the temptation they create for disregarding much of the variety and mutability of historical experience. But what alternatives are there, except an examination of the only raw material of experience that we have for studying human societies, their structure and activities as revealed in the past? One can hope that a better understanding of the latter, scanty as the resulting tested generalizations may be, would at least prevent us from placing too much confidence in a succession of theories that so often magnify partial and transient conditions into universal and immutable factors.

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