

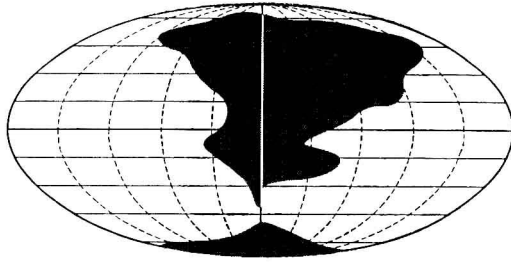


WORLD POPULATION AND
PRODUCTION

TRENDS AND OUTLOOK

W. S. Woytinsky and E. S. Woytinsky

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TRENDS AND OUTLOOK



W. S. Woytinsky AND *E. S. Woytinsky*

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FOREWORD

THIS BOOK — together with a volume now in progress on world trade, transportation and government to be published in 1955 — represents an effort to put between the covers of two manageable volumes what amounts to a statistical picture of the collective resources, as well as the economic performance and promise of the full array of the nations of the world. The authors, Mr. and Mrs. W. S. Woytinsky, have hoped and planned for many years past to prepare a broad survey such as this. Their joint background and training — years of residence and study in the United States and European countries, a knowledge of several languages and extensive travel in both industrialized and underdeveloped countries — have made them exceptionally able to carry out a study of this tremendous range. They are its sole authors and have prepared it without the help of research contributors or collaborators.

As the project took definite shape, the Rockefeller Foundation became interested in its usefulness and promise and agreed to aid in financing it through a grant administered by the Johns Hopkins University. The Fund joined with the Foundation in underwriting the preparation of the study and agreed, also, to take responsibility for its publication. An advisory committee, composed of Dr. Robert Crane and Dr. Fritz Machlup of the Johns Hopkins University and Dr. J. Frederic Dewhurst of the Twentieth Century Fund, aided materially in the administration of the project.

The Fund was led to undertake the publication of the study partly because of the wide usefulness of a similarly conceived stocktaking of the American economy which the Fund published in 1947 under the title *America's Needs and Resources*. This report, which is now being completely revised and brought up to date, is a record of past production in each of the major areas of the American economy, the resources, both human and material, available to meet the needs and demands of the people, and the probable course of future developments. Mr. and Mrs. Woytinsky's study is, in effect, a "Needs and Resources" of the entire world.

The present volume is the result of more than five years of intensive work by the authors. They bear joint responsibility for the outline of the study and every detail in carrying it into effect. Mrs. Woytinsky is primarily responsible for the sections in the present volume on agriculture (Chapters 14–20), mining (Chapters 22–24) and manufacturing (Chapters 27–31); Mr. Woytinsky, for the sections on population (Chapters 1–7), world needs and resources (Chapters 8–13) and a few chapters in other sections (Chapters 21, 25 and 26).

In a period when, more than ever before in history, all parts of the world are the direct and vital concern of every other part, this and the forthcoming volume should give the public the detailed factual basis for dealing with the multitude of problems with which the world is now beset. The Fund hopes that the panorama of the world's economy as a whole — its achievements, but even more its potentials — which these books unfold may give the reader confidence and courage to face the dangerous years ahead.

The Fund has been glad to cooperate with the Rockefeller Foundation and the Johns Hopkins University in carrying this important project through to its completion. Our appreciation also goes in full measure to the indefatigable authors, who have mastered an immense and intractable mass of factual material and made it useful and understandable to the general public which needs it so much.

EVANS CLARK, *Executive Director*
The Twentieth Century Fund

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While the authors had no contributors or collaborators in their work, they had the generous aid of many experts. We fully appreciate how much we are indebted to them for their criticisms and suggestions.

We also acknowledge with deep gratitude the assistance of various governmental and international agencies, particularly the United States Departments of Agriculture and the Interior, the Economic Cooperation Administration's missions abroad and the Secretariat of the United Nations. During our study trip in Europe, covering the United Kingdom, France, Scandinavia, the Low Countries, Switzerland, Western Germany and Italy, we received the generous cooperation of many individuals and agencies — too numerous to mention here by name.

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Our warm appreciation also goes to Mary Ross Gannett for her unsparing efforts in editing this study.

We recognize with gratitude the work of the Twentieth Century Fund in handling the difficult task of publishing a volume of this size and scope. Our deep appreciation goes to Evans Clark, the Executive Director, for his many constructive suggestions and to the Fund staff as a group for the tremendous amount of effort entailed in preparing the manuscript for the printer. Acknowledgment is also given to I. J. Starworth for his competent and careful work in drawing and preparing most of the maps and charts included as illustrative material in the book. A further word of credit is due to Minn Radner who prepared the index.

In a study of this scope, with its vast amount of detail, covering world-wide problems and some of the most controversial issues of our time, we are aware that errors are unavoidable. We accept full responsibility for possible mistakes and inconsistencies that may have occurred during the long course of preparing the original draft of the manuscript and revising it in the light of new sources of statistical data that became available before the book was published. We have, however, tried to make use of the most reliable sources of information at our disposal and have employed them to the best of our ability.

W. S. WOYTINSKY
E. S. WOYTINSKY

INTRODUCTION

THE PURPOSE of this study is to outline world economic forces and trends during the fateful era in which mechanized economy, originated on the two coasts of the North Atlantic, is becoming the universal civilization of mankind. A long and winding road has brought the world to this turn, and the turn itself is marked by violent clashes—revolutions, wars, disintegration of old empires and the rise of new.

BACKGROUND: THE TECHNICAL REVOLUTION

As long as the mechanized economy was a monopoly of a few nations, it gave them tremendous advantage over the rest of mankind. The world economy of the nineteenth century was like a pyramid, with a broad foundation and narrow top: at the base, hundreds of millions of poverty-stricken men and women, mostly illiterate, haunted by disease, many condemned in advance to premature death; at the top the industrialized nations with steadily rising standards of life, declining mortality, increasing expectation of life.

The gap between the have and have-not nations was the most characteristic feature of this system. Its transformation began when modern methods of agriculture, mining, manufacturing and transportation began to invade the underdeveloped regions. The spread of industrialism over the world has not brought equality and freedom from want to the awakening nations, but it has given them hope of a better life. They feel—or believe—that improvement is within their reach. Thus to the technological and economic dynamism of the industrial, prosperous nations is added the political dynamism in the traditionally underdeveloped, slumbering areas.

The new economic techniques challenge the patriarchal, semifeudal patterns of life that prevail in these areas. The foundations and landmarks of the primitive subsistence economy, old customs and social institutions inherited from time immemorial are disappearing in fires blazing in all parts of the world. The process is long—even now, more people live under the conditions of a subsistence economy than in the areas dominated by mechanized civilization. One civilization is on its way out; the other is advancing.

The economic transformation of the world implies far-reaching social and political changes. Whether violent or orderly, they are revolutionary in the sense of a complete and irrevocable break with the past. Such are the land reforms—or land revolutions—sweeping the underdeveloped areas of the world.

Some changes are bound to bring disillusionment to the people. Their desires are growing more rapidly than the means at their disposal. Moreover, along with obsolete customs and institutions, the new mechanized civilization is destroying traditions that made life worth living.¹

1. In his genial and lively *Strange Lands and Friendly People*, William O. Douglas describes such customs among the most backward tribes in the Near East. A traveler can readily observe similar patterns among the peoples in the tropical highlands of Central America.

The progress of mechanized civilization is the central topic of this study. We have tried to describe, measure and explain this development but have not attempted to appraise it.

The expansion of mechanized civilization has destroyed the foundation of international relationships that existed in the nineteenth century — the domination by the industrial countries of colonial and semicolonial areas in Middle and South America, Asia, Africa and Oceania. A new pattern of division of labor and international cooperation must be found to assure stability to the world which emerges from the clashes of our time. To be acceptable to the peoples that are entering — or re-entering — the historical scene, the new system of international relations must promise them equality of opportunity with their former masters. They will settle for nothing less. Equal opportunity, however, does not mean equality of wealth and income. The latter will depend on how the awakening peoples utilize the new economic and political tools being placed in their hands. Their first steps along the new road in the new environment are discussed, described and analyzed in the following pages.

The Mechanized Economy

Recent economic changes are characterized by steadily increasing momentum. The mechanized economy born some two centuries ago has been growing ever since at a continuously increasing rate. The beginning was slow, from the timid, not too successful experiments with the steam engine in the second half of the eighteenth century, to the huge but poorly equipped mills and rudimentary railways in the first half of the nineteenth. Even in the most progressive countries, the economic system of the middle of the past century was a clumsy, slowly moving affair without very bright promise for the future — wooden sailing vessels on the oceans, horse and buggy transportation on land, gas and whale-oil lights on the streets and in homes, cities scattered like islands amid borderless expanses of primitive farming.

Contrary to the prophetic vision of Adam Smith, most scholars of that time believed that the capitalistic system of production had only limited possibilities. So slow were the changes that many keen observers failed to notice them. Thus, the capitalism which Karl Marx described was an economy without railroads, practically without iron — a stock exchange with cotton mills clustered around it.

The economic world portrayed at about the same time by Friedrich List was more modern. It was planning railroads and beginning to build them. List brought his dynamic concept of an industrial system to slumbering provincial Germany from the United States, where he had witnessed the revolutionary impact of the new means of transportation on business. Contrary to Marx who, as an economist, never ceased to write about the industrial system as it had existed after the Napoleonic wars, List was fascinated by the new technological trends. But how old fashioned even his world looks to the modern reader!

Technological Progress

Acceleration of technological and economic progress came simultaneously on both sides of the Atlantic in the second half of the nineteenth century, especially the latter part of this period. The quickening came with electricity, steel and petroleum; with

the steamship that linked nations, with railways that crossed the continents and linked towns and villages to the thoroughfares. The last two or three decades of the nineteenth century brought more technological and economic changes to the nations of the West than the preceding hundred and twenty or thirty years. So stupendous was the progress that by the end of the century some students, in America as well as in Europe, believed that the industrial system had reached maturity — that every conceivable machine had been invented and put in action, all necessary railroads had been built, all major projects of urbanization completed. The speed of progress was bound to decrease.

Actually what they had seen was only the prologue to an explosive economic expansion. Unprecedented progress began after the turn of the century with the penetration of applied sciences into all fields of human activity. Inventions and discoveries followed in close succession. Cars and trucks appeared on the roads, calling to life a new system of highways. Airplanes rose in the sky and found their way into areas hitherto inaccessible by highway and railroad. Scientific agriculture came to the aid of the farmer. New, man-made materials invaded the markets. The complete story of the role of chemistry and electronics in the modern economy cannot be told within the compass of this work, but the study outlines the main developments in each field of economic activity.

The "Know-how" Formula

What has happened in the past three decades, since World War I, has been more than acceleration of the former long-range trend. The problems of struggle against hunger and want and of prosperity and economic progress have been reduced to a simple formula: *know-how*. People have discovered that skill and organization rather than accumulated wealth are the clues to economic progress, and this has been the most revolutionary discovery of our time. The tree of knowledge has been shown to the have-not peoples and there are no cherubim with flaming swords to keep them away from it.

The turn in our economic thinking and the growing emphasis on know-how as the basis of prosperity implies recognition of the supremacy of the searching, alert, flexible and free human mind and of the unlimited possibilities beyond the visible horizons of our knowledge of today. Moreover, while accumulated wealth is the possession of a few, economic and technical know-how is widespread in modern society, belonging to all and denied to none.

Indeed, the facility with which it can be transferred characterizes modern mechanized civilization. Air transportation epitomizes this. A plane can land almost anywhere and in a short time it can bring all the accessories of an efficient airfield to a selected site at a crossing of caravan trails, on a tiny island or in an oasis surrounded by bare desert. A country too rugged and too poor to build railroads and highways can have a network of airfields. The radio penetrates the wilderness ahead of the telephone and telegraph, indeed ahead of the elementary school. A hydroelectric station can be built in a region too remote from modern civilization to use a steam engine fed by coal. Modern technology spreads as widely as gaseous matter released from a container.

Natural Resources

The technological progress initiated in the modern industrialized countries and now spreading to the remotest corners of the world is the answer to questions on the carrying capacity of our planet, the depletion of its natural resources and the pressure of overpopulation. In some limited areas, scarcity of land and other natural resources, combined with a rapidly growing density of population, have doubtless produced a Malthusian situation — poverty due largely to overpopulation. Such a situation is particularly disturbing on some islands in each hemisphere — for example, in Puerto Rico, Japan and Indonesia. This is a local phenomenon, however, similar to another source of poverty — technological unemployment in certain professions in particular areas.

But overpopulation is no more responsible for poverty in a large part of the world than technological progress is to blame for mass unemployment during a depression. This question is examined in detail in the following pages. No evidence has been found of a general tendency of mankind to outgrow available resources. There is evidence, however, that the short-sighted destructive exploitation of land, forests and other resources characteristic of the ruthless nineteenth century, is being brought under control in recent times. The present phase of economic history is characterized by reclamation of the soil, irrigation of deserts, drainage of swamps, flood control, conquest of malaria and other environmental diseases, protection of cattle and plants against parasites and diseases.

Long-Range Economic Trends

This description of the present phase of our civilization may impress the reader as too optimistic. The authors are aware of the other side of the picture: of the contradictions within the modern industrial system; of the gap between technological progress and other aspects of civilization; of international tensions and the imminent danger of a new world war. These issues are not within the scope of this study. Its purpose is to outline long-range and recent trends in the world's economic structure — a broad but still limited task that provides a background for the discussion of other problems.

The trends in world economy are presented by topic rather than by country. The elucidation of particular subjects, however, is not the final aim of the study but mainly a medium for giving an over-all picture of the world. This objective has determined the selection of single topics: the space given to each depends not on its importance alone but on its relation to the whole picture.

A study of economic trends in the world requires a broad historical approach to each topic. Our economic civilization is both older and younger than most people believe. Its roots penetrate deep into the past, but most of our machines and technical methods and many of our raw materials were unknown to the generations just before us.

Modern technology is heavily concentrated in the two North Atlantic regions. The United States leads in many fields; never before has a single nation controlled so large a percentage of the world's industrial capacity. The incomparable industrial plant of the country, however, has been built on the foundation of a rich inheritance from the

Old World. The United States itself is an emanation of European culture, and its superlative techniques in agriculture, mining, manufacturing and transportation rest largely on ingenious practical adaptations of theoretical ideas originated in a dozen old countries. Although the immediate concern of this study is the present and the future rather than the past, it stresses the international genealogy of many modern inventions and occasionally refers to times as remote as those of the Bible and ancient Greece. Apart from tracing the historical roots of modern economy, such references are designed to emphasize the dynamism of the modern economy in contrast to the slowness of economic progress in the preceding millenniums.

A historical approach is particularly necessary in considering the unique position of the United States in world economics and politics. So rapid and so radical have been the changes that the present generation has been unexpectedly catapulted into the center of unfamiliar events and problems. How did the country reach this position? What are the foundations of its economic power? What are its responsibilities? A survey of historical development will aid the reader in his search for answers to these and related questions.

SCOPE OF THE STUDY

Volume One

Because of the broad scope of this survey, it is advisable to publish it in two volumes. The present volume, consisting of five parts, covers matters related to population, patterns of economic civilization and production. Some indication of the topics included in each part is given in the summary that follows.

Part I. Man and His Environment. Population problems, in a broad sense of the term, are dealt with in this section. Geographical statistics are given; a survey of the distribution of the people of the world includes data on trends in growth of population, prevalence of races, languages and religions. Migration, and the development and role of cities are considered next. The changing patterns of natality and mortality are outlined; health patterns, and the progress in the struggle against disease are described. Part I concludes with a venture in forecasting future world population.

Part II. World Needs and Resources. Human desires and the means of their satisfaction are analyzed in the chapters on consumer needs, and consumption and standards of living. Resources at the disposal of mankind are examined under two headings: natural resources and human resources. The two following chapters survey the distribution of economic activities and wealth in the world.

Part III. Agriculture. Agriculture's role in the world economy is here considered; such fundamental agricultural problems as soil depletion, reclamation and conservation; patterns of farming and land ownership; the struggle for land; and the main aspects of modern agricultural technology are then explored. In the chapters that follow, agricultural production is studied in detail: food crops, technical crops, and livestock and animal products. The survey of agriculture proper is supplemented by additional chapters on forests and forest products, and on fisheries.

Part IV. Energy and Mining. The introductory chapter, mining in the world economy, indicates the value of world mineral output and distribution. Subsequent chapters

examine production in metallic and nonmetallic minerals, coal, and petroleum and natural gas. A concluding chapter discusses the economics of energy and power.

Part V. Manufactures. The final section presents an over-all survey of manufactures in the world economy, and contains detailed descriptions of five leading industrial divisions: (1) food, drink and tobacco industries; (2) textiles; (3) iron and steel; (4) machinery and transportation equipment; and (5) the chemical industry.

Volume Two

The second volume of the study, to be completed in 1953, will deal with international trade and investments; land, water and air transportation; political organization of the world; colonialism; public finance; and international cooperation.

Each volume is planned for continuous reading or for reference use — each part, and each chapter, separately. Repetition, unavoidable in such a plan, has been reduced so far as possible by cross references.

STATISTICAL AND TABULAR METHODS

World economic trends do not all incline in the same direction, nor do they move at the same pace. Some are waning as others are becoming increasingly important. The component trends that make up the over-all pattern of development must be weighted, and this is a task for statistics. This consideration has determined the character of the study; synthetic and interpretative in purpose, it is largely statistical in form. It not only makes extensive use of statistics but is also intended to serve as an introduction to the realm of international statistics.

Statistical tables on the following pages are designed for laymen. They are accompanied by methodological explanations that would be omitted in a more technical publication, but the technician will miss the customary array of footnotes.

This omission is intentional. In a ten-column table that covers some fifty countries, only a few figures are strictly comparable and each line, each column and almost each figure calls for a footnote.² Such paraphernalia, however, would appear as unbearable pedantry to the general reader. Moreover, after having read — or skipped — all the footnotes the reader would learn not much more than that the figures differ from one another in concept, method of computation and the exact date to which they refer and are to be used with caution. Since this warning applies to almost all international tables, it can be given directly, here and now, without repetitious footnotes.

This study makes a point of presenting statistics in the simplest possible form, with illustrative charts and brief analytical summaries in the text but with a minimum of technical detail. The reader interested in omitted details is referred to the original sources.

World Totals and Averages

The pages that follow contain frequent references to world totals and national and regional averages — for population; births and deaths; acreage and harvest; output of

2. The United Nations *Demographic Yearbook, 1951* contains tables with more than one hundred footnotes and one requires a hundred and fifty-six, although footnotes are used with discrimination and restraint.

mineral fuels and metals; consumption of food; raw materials and energy; national income and so on. Most of these data are presented in the conventional form: population with precision to the nearest thousand or million; birth and death rates to one tenth of one per cent per 1,000 inhabitants; output of metals to one thousand tons; per capita consumption to one tenth of a pound; per capita national income to the dollar. These precise figures should not be taken too seriously, however, for most of the data have a considerable margin of error.

In fact, more or less reliable and detailed current population statistics are available for only two dozen countries, with an aggregate population of less than 600 million, about a fourth of mankind. Even these data are not strictly comparable because of significant differences in methods of enumeration and classification. For an area embracing another fourth of the world's population, including India and large parts of South America, statistics are less abundant. For the rest of the world — notably China, the Near and Far East, the USSR and a large part of Africa — statistical information is extremely meager.

When the precise number of inhabitants in an area is unknown, its other statistics become doubtful. When a country with rudimentary school and public health services reports a death rate lower than that of the most progressive countries, this rate reflects the inadequacy of the country's statistics rather than the enviable health of its inhabitants. Such death rates, however, belong in the picture of world health statistics and cannot be denied a place in international surveys.

The reader is cautioned that international surveys covering a large number of countries are not selective and contain figures of unequal reliability; inclusion of a figure in the survey does not mean its endorsement by the authors.

This observation applies also to economic statistics. Official data on the acreage and yield of various grains and livestock, on mineral and industrial production, on national income, consumption and so on are based largely on estimates and extrapolation of small samples. They always contain an appreciable margin of error, and these errors are not always distributed at random; there may be a definite tendency toward understatement or overstatement in certain series.

Despite these limitations in international statistics, they are the only available tool for quantitative appraisal of the divergent trends in world affairs, indeed, the cornerstone of any exploration in the field of world economy. Their indisputable service is to give the reader a sense of magnitude and relative values.

Life Behind the Iron Curtain

The United Nations and its specialized agencies have made serious attempts to develop modern statistical reporting throughout the world and to increase the comparability of national statistics. The Kremlin has met these efforts with a resolute veto and a statistical blackout in the areas under its control. Besides boycotting the inquiries of the United Nations, the Kremlin is flooding the world with reports of its own which contravene all principles of modern statistics. These reports are usually indexes of production computed in an unknown way and related to an unknown base.

There is no way to segregate truth from falsehood in these communications, but

their purpose is obvious. Some of them have scarcely more than accidental similarity to the statistics used by the Soviet authorities in the economic planning and operation of their industrial plant and are concocted as instruments of propaganda at home and abroad. Moreover, most of the Soviet statistics are presented in such a form as to be effective as propaganda without revealing the facts of life behind the Iron Curtain.

Apart from the lack of more or less trustworthy statistics, it is difficult to discuss the economy of the USSR in an economic survey of the world because of the basic differences between totalitarian and free economies.

The incentive in the free economy is profit, but the producer cannot make a profit unless he sells his product and cannot sell the product unless it incites or satisfies demand and meets the needs of consumers. Thus, the enterprise system is ultimately oriented toward satisfaction of people's needs. In a totalitarian state, on the contrary, all economic activities are subordinated to the interests of the party or clique that controls the government. The perpetuation and expansion of its power become the ultimate goals of the national economy and determine production plans. The remaining surpluses are used for private consumption and are distributed among various groups of the population according to political expediency.

This economic system, although perfectly logical when observed according to the scale of values of the totalitarian state, seems full of contradictions from the Western viewpoint. It combines an extremely low level of living and real wages with a formidable heavy industry. In contrast to the free economy, it permits only insignificant improvement—or no improvement at all—in civilian consumption while its munitions industries are among the most dynamic and efficient in the world.

It is noteworthy that the repercussions of World War II on the economic system of the USSR have conformed to its militaristic nature. The vast conquests in the west have brought little improvement to the working population in the USSR but have put at the disposal of the Soviet the arsenals of Skoda, the munitions factories of Eastern Germany and an army of Czech and German technicians who were the brains of the war industry under Hitler. The duality of the Soviet economy is clearly revealed by the ranking of the USSR among other nations: close to the bottom in per capita consumption and close to the top in capacity of iron and steel mills.

Estimates and Projections

Despite the limitations of international statistics, they permit certain generalizations and projections. The writer must judge how far he should go in this direction. The only rigid rule is that he must warn the reader when he shifts from the thin ice of official statistics to the still thinner ice of extrapolation. In the pages that follow the reader will find warning signs wherever they seem appropriate.

This study includes numerous estimates of the distribution of world population by language and religion; the size of the world's labor force and its distribution by continent and industry; the value of world output and so on.

All these estimates are, of course, open to criticism and are presented as rough approximations. They cannot be more precise than the statistics on which they are based. The projections ventured here and there require an additional reservation: they