

王巧平 方 彬 赵国柱 / 主编

诺贝尔奖



获奖演说精选集 (英文版)

【经济学卷·自然科学卷】

南开大学出版社

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前 言

随着我国经济社会的发展，近年来英语学习的热潮不断高涨，出版物市场更是争奇斗艳，涌现出了大批英语学习的书籍和刊物，这对于推动英语学习者水平的提高起到了很大的作用。在林林总总、蔚为大观的众多英语学习书籍中，仍有很多值得思考的空间。如何使读者在提高英语水平，增强对英语的理解能力，丰富语言修养的同时，更能获得心灵上的感召、思想上的升华，这无疑是很多人更加迫切需要的。有鉴于此，我们选编了这本《诺贝尔奖获奖演说精选集》，希望在这一方面做一些工作，同时也是对英语学习的热潮尽自己的一点绵薄之力。

诺贝尔奖作为每年一度的重要奖项，其获奖者都是在各个领域内作出突出贡献的人物。他们不仅在各自的专业领域内造诣非凡，而且其睿智的思想、伟大的心灵以及求真务实的态度、永不言败的精神，在这个浮躁的社会里更显得弥足珍贵。仔细阅读他们的演讲辞，倾听伟人的声音，可以帮助我们去纵览世界的发展和变化，去了解经济领域的波谲云诡，去追寻科学发展的脉络。我们相信，在华灯初上时，读者在书桌旁拿起这本《精选集》细细读来，除了获得英语水平的提高以外，更能获得知识的拓展、心灵上的陶冶以及人格上的升华。

本书的编写也主要遵循这一原则。全书包括两部分：经济学卷和自然科学卷。诺贝尔奖获奖者也均来自这两个领域，其中自然科学卷又涵盖几个领域，包括物理学、化学和生理学/医学。考虑到本书使用者的背景，我们对部分获奖者的演说辞作了节选，对一些句子作了注释，并对获奖者作了简单的介绍。对于有一定英语基础或具有中等英语水平以上的读者，我们相信这本《精选集》是一个不错的选择。

本书的编写得到了很多同事和朋友的热情关心、帮助和指导，我们也参考了很多的相关材料，南开大学出版社在本书的策划、编写、版式设计等方面做了大量的工作，在此一并表示感谢。对于其中的不当和疏漏之处，敬请读者批评指正。

编 者

2006年10月

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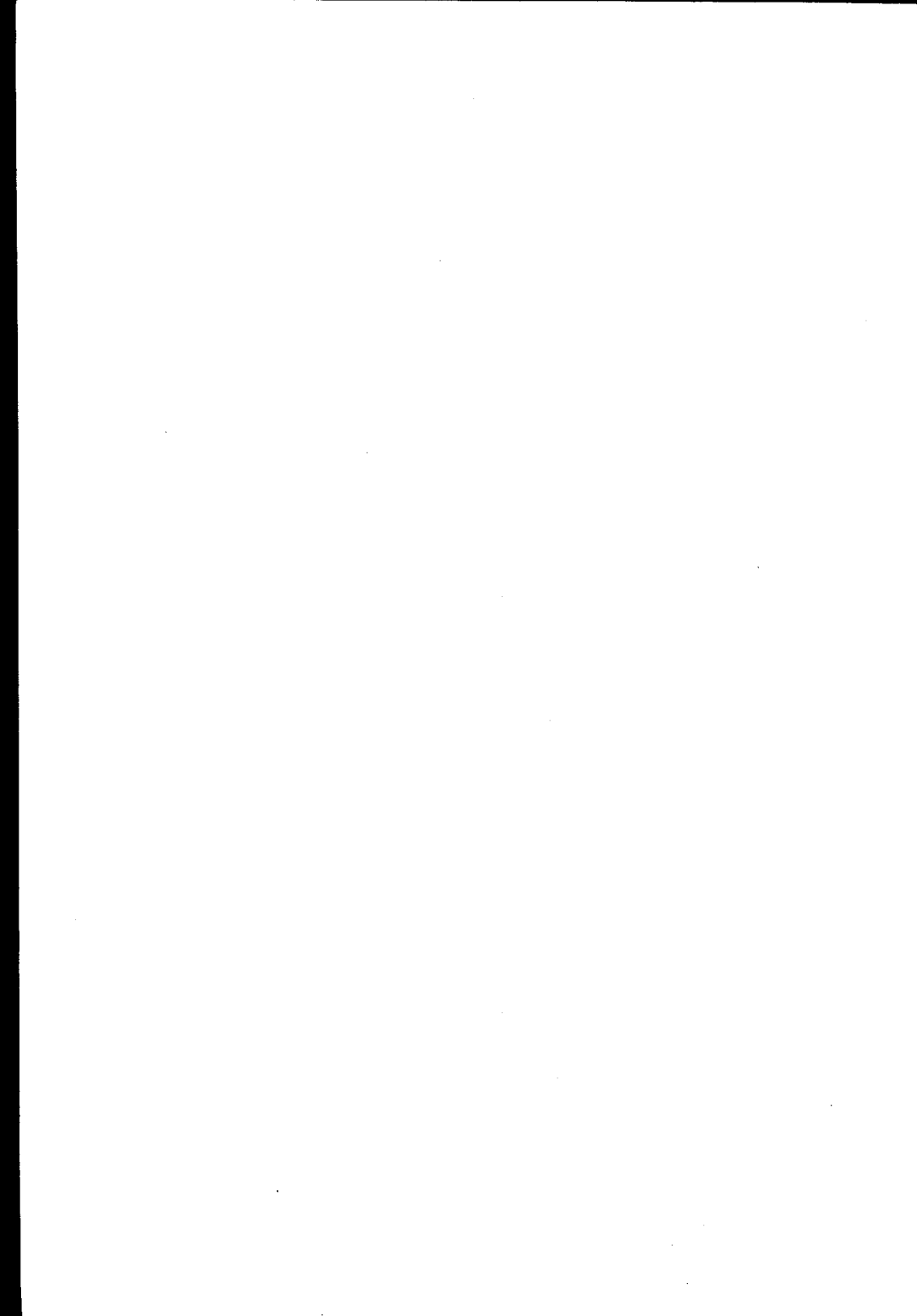
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Part One Nobel Lectures in Economics





Simon Kuznets

西蒙·库兹涅茨，美国著名经济学家，1901年4月30日出生在乌克兰哈尔科夫市的一个皮毛商人的家庭里，父亲亚伯拉罕·库兹涅茨和母亲波琳·弗里德曼都是犹太人。在西蒙·库兹涅茨6岁的时候，他的父亲移居美国。西蒙·库兹涅茨本人说，他从那时候起已经对经济学产生了浓厚的兴趣，相信经济学是研究一切社会问题的基础。

1922年，西蒙·库兹涅茨也移居美国，进入哥伦比亚大学攻读经济学。他于1923年获得文学学士学位，1924年获得文科硕士学位，1926年获得博士学位。1927年，西蒙·库兹涅茨进入米契尔（W. C. Mitchell）教授主持的国民经济研究局（NBER），并在那里一直工作到1961年。在这个期间，他曾在大学和政府部门任职：1936年至1954年担任宾夕法尼亚大学经济学和统计学助理教授、教授，1942年至1944年担任哥伦比亚特区华盛顿战时生产部计划统计局副局长和计划委员会研究主任，1946年担任中国国家资源委员会顾问，1950年至1951年担任印度国民收入委员会顾问，1953年至1963年担任以色列法尔克经济研究计划主席，1954年至1960年担任约翰·霍布金斯大学政治经济学教授。1960年，他到哈佛大学担任经济学教授，最后于1971年退休。在这个期间，他于1963年担任以色列毛立斯·法尔克经济研究所理事会理事及名誉主席，1961年至1970年任美国社会科学研究会中国经济委员会主席。

西蒙·库兹涅茨在西方经济学界十分活跃。他是美国经济学会、美国统计学会、美国哲学学会、美国科学促进协会、国际统计学会的会员，美国经济史学会、英国皇家统计学会的名誉会员，瑞典皇家科学院院士，英国科学院通讯院士，担任过美国经济学会会长和美国统计学会会长等职。他还曾获得普林斯顿大学、宾夕法尼亚大学、哈佛

大学、耶路撒冷希伯来大学名誉博士学位。

自 20 世纪 20 年代以来，西蒙·库兹涅茨在经济周期、国民收入核算、经济增长等研究领域中都作出了杰出的贡献，并提出了许多深刻的见解。他在经济周期研究中所提出的为期 20 年的经济周期，被西方经济学界称为“库兹涅茨周期”。他因在国民收入核算研究中提出国民收入及其组成部分的定义和计算方法而被经济学家们誉为“美国的 G.N.P. 之父”。他对经济增长的分析，被西方经济学界认为揭示了各发达国家一个多世纪的经济增长过程。西蒙·库兹涅茨的研究成果被引用的次数，在西方经济学界的经济学家和统计学家中无人能比。正因为这样，在 1971 年诺贝尔经济学奖的评选过程中，瑞典皇家科学院从一百多个提名所选出的十个候选人中，最后确定了西蒙·库兹涅茨。

Modern Economic Growth: Findings and Reflections¹

1. Definitions

A country's economic growth may be defined as a long-term rise in capacity to supply increasingly diverse economic goods to its population, this growing capacity based on advancing technology and the institutional and ideological adjustments that it demands. All three components of the definition are important. The sustained rise in the supply of goods is the result of economic growth, by which it is identified. Some small countries can provide increasing income to their populations because they happen to possess a resource (minerals, location, etc.) exploitable by more developed nations that yields a large and increasing rent. Despite intriguing analytical problems that these few fortunate countries raise, we are interested here only in the nations that derive abundance by using advanced contemporary technology — not by selling fortuitous² gifts of nature to others.

Advancing technology is the permissive source of economic growth, but it is only a potential, a necessary condition, in itself not sufficient. If technology is to be employed efficiently and widely, and, indeed, if its own progress is to be stimulated by such use, institutional and ideological adjustments must be made to effect the proper use of innovations generated by the advancing stock of human knowledge. To cite examples from modern economic growth: steam and electric power and the large-scale plants needed to exploit them are not compatible with family enterprise, illiteracy, or slavery — all of which prevailed in earlier times over much of even the developed world, and had to be replaced by more appropriate institutions and social views. Nor is modern technology compatible with the rural mode of life, the large and extended family pattern, and veneration³ of undisturbed nature.

The source of technological progress, the particular production sectors that it affected most, and the pace at which it and economic growth advanced, differed over centuries and among regions of the world; and so did the institutional and ideological adjustments in their interplay with the technological changes introduced into and diffused through the growing economies. The major breakthroughs in the advance of human knowledge, those that constituted dominant sources of sustained growth over long periods and spread to a substantial part of the world, may be termed epochal innovations⁴. And the changing course of economic history can perhaps be subdivided into economic epochs, each identified by the epochal innovation with the distinctive characteristics of growth that it generated. Without considering the feasibility of identifying and dating such economic epochs, we may proceed on the working assumption that modern economic growth represents such a distinct epoch — growth dating back to the late eighteenth century and limited (except in significant partial effects) to economically developed countries. These countries, so classified because they have managed to take adequate advantage of the

potential of modern technology, include most of Europe, the overseas offshoots⁵ of Western Europe, and Japan — barely one quarter of world population. This paper will focus on modern economic growth, but with obviously needed attention to its worldwide impact.

Limitations of space prevent the presentation of a documented summary of the quantitative characteristics commonly observed in the growth of the presently developed countries, characteristics different from those of economic growth in earlier epochs. However, some of them are listed, because they contribute to our understanding of the distinctive problems of economic life in the world today. While the list is selective and is open to charges of omission⁶, it includes those observed and empirically testable characteristics that lead back to some basic factors and conditions, which can only be glimpsed and conjectured, and forward to some implications that have so far eluded measurement.

2. The six characteristics

Six characteristics of modern economic growth have emerged in the analysis based on conventional measures of national product and its components, population, labor force, and the like. First and most obvious are the high rates of growth of *per capita* product and of population in the developed countries — both large multiples of the previous rates observable in these countries and of those in the rest of the world, at least until the recent decade or two. Second, the rate of rise in productivity, i.e. of output per unit of all inputs, is high, even when we include among inputs other factors in addition to labor, the major productive factor — and here too the rate is a large multiple of the rate in the past. Third, the rate of structural transformation of the economy is high. Major aspects of structural change include the shift away from agriculture to non-agricultural pursuits and, recently, away from industry to services; a change in the scale of productive units, and a related shift from personal enterprise to impersonal organization of economic firms, with a

corresponding change in the occupational status of labor. Shifts in several others aspects of economic structure could be added (in the structure of consumption, in the relative shares of domestic and foreign supplies, etc.). Fourth, the closely related and extremely important structures of society and its ideology have also changed rapidly. Urbanization and secularization⁷ come easily to mind as components of what sociologists term the process of modernization. Fifth, the economically developed countries, by means of the increased power of technology, particularly in transport and communication (both peaceful and warlike), have the propensity⁸ to reach out to the rest of the world — thus making for one world in the sense in which this was not true in any pre-modern epoch. Sixth, the spread of modern economic growth, despite its worldwide partial effects, is limited in that the economic performance in countries accounting for three-quarters of world population still falls far short of the minimum levels feasible with the potential of modern technology.

This brief summary of two quantitative characteristics of modern economic growth that relate to aggregate rates, two that relate to structural transformation, and two that relate to international spread, supports our working assumption that modern economic growth marks a distinct economic epoch. If the rates of aggregate growth and the speed of structural transformation in the economic, institutional, and perhaps even in the ideological, framework are SO much higher than in the past as to represent a revolutionary acceleration, and if the various regions of the world are for the first time in history so closely interrelated as to be one, some new major growth source, some new epochal innovation, must have generated these radically different patterns. And one may argue that this source is the emergence of modern science as the basis of advancing technology — a breakthrough in the evolution of science that produced a potential for technology far greater than existed previously.

Yet modern growth continues many older trends, if in greatly

accelerated form. This continuity is important particularly when we find that, except for Japan and possibly Russia, all presently developed countries were well in advance of the rest of the world before their modern growth and industrialization began, enjoying a comparative advantage produced by pre-modern trends. It is also important because it emphasizes that distinction among economic epochs is a complicated intellectual choice and that the continuation of past trends and their changing patterns over time are subjects deserving the closest attention. Does the acceleration in growth of product and productivity in many developed countries in the last two decades reflect a major change in the potential provided by science-oriented technology, or a major change in the capacity of societies to catch up with that potential? Is it a way of recouping the loss in standing, relative to such a leader as the United States, that was incurred during the depression of the thirties⁹ and World War II? Or, finally, is it merely a reflection of the temporarily favourable climate of the U.S. international policies? Is the expansion into space a continuation of the old trend of reaching out by the developed countries, or is it a precursor¹⁰ of a new economic epoch? These questions are clearly illustrative, but they hint at broader analytical problems suggested by the observation of modern economic growth as a distinct epoch.

The six characteristics noted are interrelated, and the interrelations among them are most significant. With the rather stable ratio of labor force to total population, a high rate of increase in *per capita* product means a high rate of increase in product per worker; and, with average hours of work declining, it means still higher growth rates in product per man-hour. Even if we allow for the impressive accumulation of capital, in its widest sense, the growth rate of productivity is high, and, indeed, mirrors the great rise in *per capita* product and in *per capita* pure consumption. Since the latter reflects the realized effects of advancing technology, rapid changes in production structure are inevitable — given the differential

impact of technological innovations on the several production sectors, the differing income elasticity of domestic demand for various consumer goods, and the changing comparative advantage in foreign trade. As already indicated, advancing technology changes the scale of production plants and the character of the economic enterprise units. Consequently, effective participation in the modern economic system by the labor force necessitates rapid changes in its location and structure, in the relations among occupational status groups, and even in the relations between labor force and total population (the last, however, within narrow overall limits). Thus, not only are high aggregate growth rates associated with rapid changes in economic structure, but the latter are also associated with rapid changes in other aspects of society — in family formation, in urbanization, in man's views on his role and the measure of his achievement in society. The dynamic drives of modern economic growth, in the countries that entered the process ahead of others, meant a reaching out geographically; and the sequential spread of the process, facilitated by major changes in transport and communication, meant a continuous expansion to the less developed areas. At the same time, the difficulty of making the institutional and ideological transformations needed to convert the new large potential of modern technology into economic growth in the relatively short period since the late eighteenth century limited the spread of the system. Moreover, obstacles to such transformation were, and still are being, imposed on the less developed regions by the policies of the developed countries.

If the characteristics of modern economic growth are interrelated, in that one induces another in a cause and effect sequence or all are concurrent effects¹¹ of a common set of underlying factors, another plausible and significant link should be noted. Mass application of technological innovations, which constitutes much of the distinctive substance of modern economic growth, is closely connected with the

further progress of science, in its turn, the basis for additional advance in technology. While this topic is still to be studied in depth, it seems fairly clear that mass-uses of technical innovations (many based on recent scientific discoveries) provide a positive feedback. Not only do they provide a larger economic surplus for basic and applied research¹² with long time leads and heavy capital demands, but, more specifically, they permit the development of new efficient tools for scientific use and supply new data on the behavior of natural processes under the stress of modification in economic production. In other words, many production plants in developed countries can be viewed as laboratories for the exploration of natural processes and as centers of research on new tools, both of which are of immense service to basic and applied research in science and technology. It is no accident that the last two centuries were also periods of enormous acceleration in the contribution to the stock of useful knowledge by basic and applied research — which provided additional stimuli to new technological innovations. Thus, modern economic growth reflects an interrelation that sustains the high rate of advance through the feedback from mass applications to further knowledge. And unless some obstacles intervene, it provides a mechanism for self-sustaining technological advance, to which, given the wide expanse of the universe (relative to mankind on this planet), there are no obvious proximate limits.

3. Some implications

I turn now to a brief discussion of some social implications¹³, of some effects of modern economic growth on conditions of life of various population groups in the countries affected. Many of these effects are of particular interest, because they are not reflected in the current measures of economic growth; and the increasing realization of this shortcoming of the measures has stimulated lively discussion of the limits and limitations of economic measurement of economic growth.