DEMOGRAPHIC DESTINIES

Interviews with Presidents of the Population Association of America

Interviews Referencing Harold F. Dorn
PAA President in 1957-58

This series of interviews with Past PAA Presidents was initiated by Anders Lunde (PAA Historian, 1973 to 1982)
And continued by Jean van der Tak (PAA Historian, 1982 to 1994)
And then by John R. Weeks (PAA Historian, 1994 to present)
With the collaboration of the following members of the PAA History Committee: David Heer (2004 to 2007), Paul Demeny (2004 to 2012), Dennis Hodgson (2004 to present), Deborah McFarlane (2004 to 2018), Karen Hardee (2010 to present), Emily Merchant (2016 to present), and Win Brown (2018 to present)

HAROLD F. DORN

We do not have an interview with Harold Dorn, who was the 21st PAA President (1957-58). However, as Andy Lunde and Jean van der Tak (VDT) were interviewing other past presidents, they regularly asked questions about those early presidents whom they had been unable to interview. Below are the excerpted comments about Harold Dorn.

CAREER HIGHLIGHTS

Harold Fred Dorn was born in upstate New York in 1906. He earned a B.S. degree at Cornell University in 1929, and his Ph.D. at the University of Wisconsin in 1933. He spent a year working at the Scripps Foundation for Research in Population Problems at Miami University in Ohio (where he met his future wife), and a year as a Social Science Research Council Fellow at University College, London, where he was introduced to demography. He worked for the Works Progress Administration in the Franklin Roosevelt administration in the mid-1930s, and in 1936 began working for the Public Health Service. He remained there, working at the National Institutes of Health, until his untimely death from bone cancer in 1963.

From Andy Lunde's interview with Frank Notestein in 1973:

LUNDE: What was the Census Bureau like in those days [1930s]? Didn't they have a professional group that might be called population experts?

NOTESTEIN: Well, they had two PhDs. One was Elbert Edwards who did the economics at the time, occupational class variations. The other was Joseph Hill, who was a very considerable scholar. Later Leon Truesdell [PAA President 1939-40] came in. He took his Ph.D. in Brookings; he'd been in the Census before then. Stewart, the director of the Census, started as an office boy. I remember vividly some of us worrying about accuracy when he gave a long speech, something to the effect that you simply had to take everything people reported as true and one could never raise questions about [what was reported]. But he was a pretty good director of the Census.

LUNDE: When did Dr. Harold Dorn [PAA President 1957-58] come into the picture?

NOTESTEIN: Much later. I remember because I found out afterward, much to my surprise, that I'd been a candidate for that job. The committee decided to offer it to him and they couldn't have been more correct. Hal was a very good director of Vital Statistics and my interests were in quite a different direction.

From Andy Lunde's interview with Conrad Teauber in 1973:

LUNDE: What do you recall of the major figures in PAA during the early years?

TAEUBER: Louis Dublin [President, 1935-36] was a fascinating figure. I read his autobiography a few years ago. He arrived in New York penniless. From the ship, his father brought the family to a boarding house where he had rented space and they walked there from the ship, carrying the luggage. Louis took full advantage of the educational opportunities that were available to immigrant groups in New York City. Louis was a short person, very earnest, very friendly, very human. He was deeply devoted to the work he was doing and very competent. He was devoted to the improvement of public health and improvement of living conditions, especially of the poor. He worked very closely with Alfred J. Lotka.

Lotka [PAA President, 1938-39] was also a short person. He seemed very much more reserved. He worked closely with P.K. Whelpton [President, 1941-42] in the development of methods of measuring deaths and births and the "true" rate of natural increase, recognizing that current birth and death rates were not necessarily good measures of the long-run trends.

During the planning phase of the 1970 census, we conducted a series of meetings in various parts of the country to learn what users felt they needed from that census. One meeting was in Florida. When we found that the meeting was to be held not far from the retirement community where Dublin was living we invited him to join us and he did. He spoke to the group, with special attention to his services on advisory committees for earlier censuses and placed the whole development of census content and techniques into historical perspective, which was a very useful contribution to the meeting. It was another illustration of his devotion to the cause of federal statistics.

Another person who played a major role in the early days was Halbert Dunn, who was the first chief of what was then known as the Office of Vital Statistics, now the National Center for Health Statistics. Harold Dorn [PAA President, 1957-58] of the National Institutes of Health was very active in the Association, a very effective member.

results of the mail ballot for the election of officers of the Association and other members of the Board of Directors were announced.

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The members of the Nominating Committee elected by the Board for the coming year are: Irene B. Taeuber, Chairman, and Gertrude Bancroft and Everett S. Lee.

FUTURE MEETINGS OF THE POPULATION ASSOCIATION

The 1964 Annual Meeting is scheduled to take place June 11-13 at the Sheraton Palace Hotel, San Francisco, at the invitation of the University of California. The Board of Directors has accepted invitations to meet at Princeton in 1965 and at the University of Chicago in 1966.

HAROLD F. DORN
1906-1963

Knowledge about the conditions affecting human birth, death and population movements has been enlarged, the interest of other persons in vital problems and their capacity to deal with them effectively has been fortified, and cooperative national and international action in this field has been clarified by the life and work of Harold Dorn. These gains accrued from the work of a rigorous and creative scientist characterized by singleness of purpose and equanimity.

Dorn was born in Tompkins County, New York, in 1906. He completed studies leading to the degrees of Bachelor of Science at Cornell University in 1929 and Doctor of Philosophy at Wisconsin University in 1933. His formative experience included work at the Scripps Foundation for Research in Population Problems, 1931-32, and study as Social Science Research Council Fellow at University College, London. At London he

entered a seminar offered by R. A. Fisher along with other eager students; the others gradually faded out, leaving Harold as the sole survivor. In the course of these studies he acquired a mastery of the principles and methods of demographic, epidemiological and social research, and a philosophical conception of the evolution and ecology of the human species. While working at the Scripps Foundation he met Celia Carmine who became his wife and the mother of their two daughters, both of whom are now married.

Dorn joined the cohorts of social scientists recruited for national service during the administration of Franklin D. Roosevelt. After initial service with F.E.R.A.-W.P.A., he participated in the study of the nation's human resources sponsored by the National Resources Committee. He was a major contributor to its report: The Problems of a Changing Population. He entered the Public Health Service in 1936, and continued this association through his life. He became the principal mentor in biometrics of the National Health Institutes.

He had a penchant for tackling obscure and critical problems such as the relation of longevity to fertility and the relation of migration to physical and mental health. He was engaged at the time of his death in planning an investigation of the mortality of English and Norwegian immigrants in the United States and their non-migrating sibs, with special reference to mortality from chronic respiratory diseases (higher in the countries of origin) and cardiac diseases (higher in the United States).

Though eschewing irresponsible speculation, Dorn had the courage to state clearly the implications of the evidence at his disposal. Research that he planned and evidence that he assembled provided the most convincing demonstration of a relationship between smoking and cancer in the United States. He was equally forthright in the treatment of demographic issues. He presented a definitive exposition in 1950 of pitfalls in the construction and interpretation of population perspectives. His recognition that "to control his numbers man will soon be forced to choose between high mortality and low fertility" was set forth in an article in Science, January, 1962, and in a background paper to The Twenty-Third American Assembly, convened at Arden House shortly before his death. He did not need to be, and never was, unduly concerned about personal status or reputation. He recognized that probabilistic sampling was impossible in the research conducted by Alfred Kinsey and his associates, and he accepted an invitation to serve as a Consulting Editor in the preparation of Sexual Behavior in the Human Female.

He was, at the same time, a good "organization man." He played an active role in numerous associations and committees concerned with medical and social research, including the Technical Advisory Committee for the 1950 Census of Population, the National Committee on Vital and Health Statistics, the Council of Scientific Advisors of the American Cancer Society, the Population Association of America, and the Social Statistics Section of the American Sociological Society. He was awarded the Legion of Merit for his work as Chief of the Medical Statistics Division of the Surgeon General's Office during World War II. He was largely responsible for the development of the National Institute of Health's broad program for the training of epidemiologists and biostatisticians.

His activities extended far beyond the national scene. In 1953 he became Secretary-General of the International Union against Cancer, and served in this capacity until his death. He represented the United States in conferences on revision of the International List of Diseases, Injuries and Causes of Death where he vigorously supported a multiple-cause classification of the causes of death, and was a member of the WHO Expert Committee on Health Statistics. He ignored the Iron Curtain in the advancement of science. Shortly before his death he made an extended tour in the Soviet Union and Yugoslavia in connection with plans for cooperative investigations of coronary heart diseases and, incidentally, returned with a series of splendid photographic slides that reflected a lively interest in persons, as well as in scenery and art. He was one of the early American members of the International Union for the Scientific Study of Population.

Harold Dorn was both "tough-minded" and generous. He tended to view human frailities from which he was eminently free, such as pretentiousness, inefficiency or sentimentality, with amusement rather than with anger. He had a sympathetic interest in his associates, students and friends. At home the Dorns engaged in experiments in gardening, some of which were successful. They enjoyed food, music, and hospitality.

The dread disease which took Harold Dorn's life is one that already has a lessened force due to investigations with which he was associated. Moreover, the further development of such studies can be expected to diminish further its power in the future. In this and in many other ways his elan vital is still a force in human affairs.—Frank Lorimer.

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ERRATA

In the Statistics Section in Population Index, Vol. 29, No. 3, April 1963, p. 198, the intrinsic rates (per 1000 females) for U. S. Continental, non-whites, for 1960 should read as follows:

Natural Increase	26.7
Birth	33.2
Death	6.6

Harold Dorn's PAA Presidential Address, given at the 1958 annual meeting in Chicago, was published later that year in Eugenics Quarterly

Darwin revisited

Harold F. Dorn

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DARWIN REVISITED*

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Editor's Note: Charles Darwin's first public statement about the origin of species was published just one hundred years ago. The centenary of this epoch-making event is being celebrated all over the world.

MORE THAN ONE MILLION known and described species of animals and plants live on the earth. This is not a complete inventory of all living species since new types continually are being identified. They vary in size from the ultra-microscopic viruses to the giant sequoia and the huge blue whale; in complexity from the single cell amoeba to animals with billions of cells; some manufacture their own food while others can exist only by devouring another species. They live in all kinds of environments—in deserts and arctic wastes; in the darkness of the ocean depths; in the air, water, and soil; in forests and grasslands. Although diverse, this multitude has one thing in common—every species is governed by the same biological laws.

Of these species of organisms, only man can in part control and modify his environment. As a result of this ability man now occupies and dominates the earth to an extent probably never before approached by any other species. This dominance is very recent and constitutes a situation to which man still is far from adjusted.

It does not free him, however, from the inexorable working of the biological laws that govern all living organisms. The multitude of microorganisms over which man is temporarily dominant have not been banished from the earth. They are still striving to regain their former status. How long man will continue to enjoy his newly gained dominance will depend to a large extent upon how wisely he exercises his abilities and knowledge. The struggle for existence still goes on.

The origin of man is concealed in the dim past. The direct ancestors of *Homo sapiens* possibly had become differentiated early in the Pleistocene period which began 600,000 to 1,000,000 years ago. The present subgroups of *Homo sapiens* may have existed for as long as 100,000 years. Skeletons of modern man dating from 50,000 to 80,000 years ago have been found in caves in Europe. These dates are largely conjectural; of the millions of persons who have inhabited the earth, skeletal remains have been found of only a very few who lived prior to relatively recent times and these remains are mainly fragments of skulls.

During all but the most recent years of the centuries of his existence man must have lived, reproduced, and died as other animals. The increase in his numbers was slow and governed by the availability of wild food sources. Like other animals, *Homo sapiens* was subject to the three great regulators of population size—pestilence, privation, and warfare. Among all species except *Homo sapiens* the killing of one animal by another is primarily for food. Only man has developed the practice of killing others solely for the purpose of gaining dominance.

Approximately a century ago Darwin

*Adapted from presidential address before the Population Association of America, May 3, 1958 in Chicago, Illinois.

and Wallace independently proposed the Theory of Natural Selection in explanation of the process by which existing species of plants and animals have been derived from earlier forms. With modifications made necessary by the subsequently developed knowledge of genetics, this theory is accepted today by most scientists.

Among the essential features of the Theory of Natural Selection are: (a) the mass production of offspring resulting in (b) a struggle for existence not only between species but also between members of the same species; (c) the introduction of variation through mutation and gene recombination and (d) the hereditary transmission of characteristics.

The evolutionary process has endowed most species with a reproductive potential that, unchecked, would overpopulate the entire globe within a few generations. The tape worm, Taenia, may lay an estimated 120,000 eggs per day; an adult cod lays possibly four million eggs per year; a frog will produce as many as 10,000 eggs per spawning. Under favorable conditions a pair of English sparrows would have 276 billion descendants in 10 years. The human ovaries are thought to contain approximately 200,000 ova at puberty while a single ejaculation of human semen may contain 200 million spermatazoa.

The almost incomprehensible reproductive potential illustrated by these figures is kept in check by interspecies competition in the struggle for existence, by disease, and by limitation of the available food supply. Not only are large losses of eggs and young characteristic of most species but, perhaps of equal importance for the preservation of a species, few adults survive for more than a small fraction of their potential life span.

This may be illustrated by counts of survivors of a squirrel population in a game refuge. In captivity, squirrels may live at least 15 years. Of 100 squirrels born in the wild, 53 survived 6 months, 29 survived one year, and 8 survived two years; only one per thousand lived to see its sixth year.

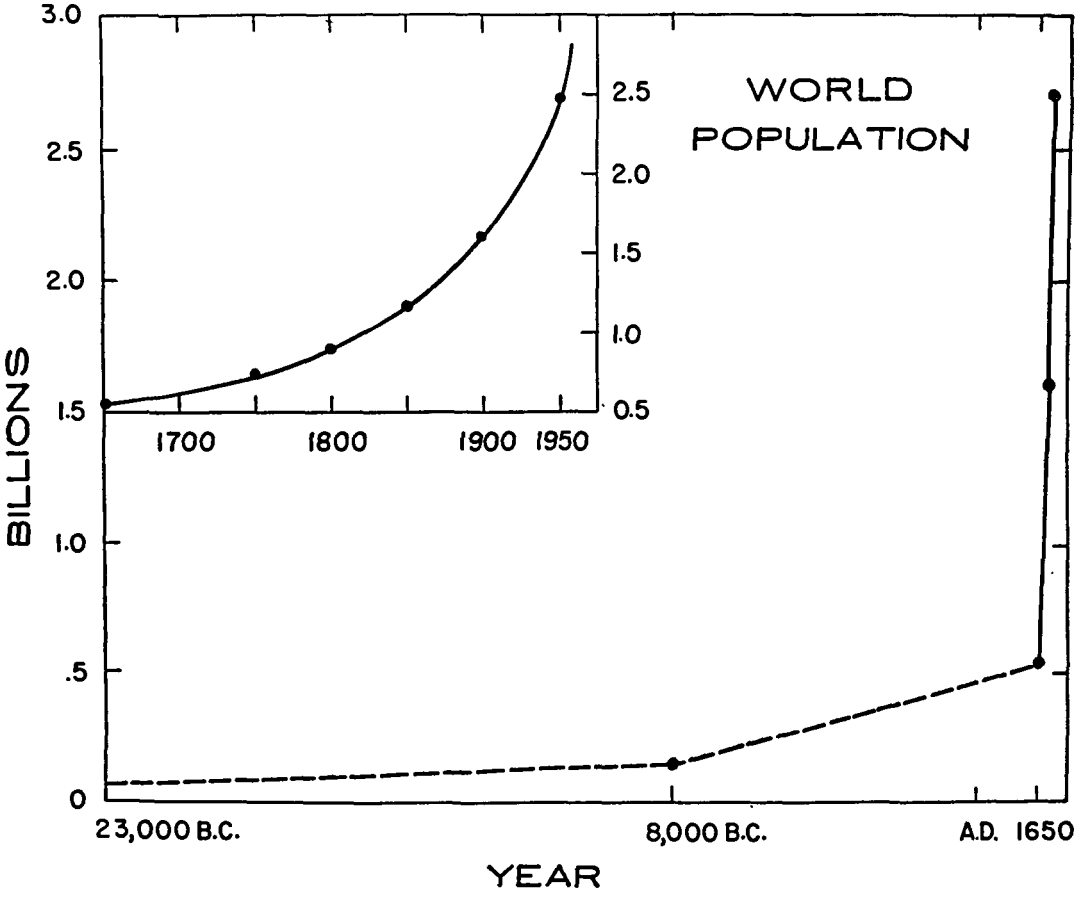
Homo sapiens has lived and died in much the same way until a few decades ago. We often forget how recently man has gained control over pestilence and famine. In 1832, 1849, and 1854 epidemics of cholera raised the general death rate in New York City to a level of more than 45 per 1,000 per year. It was not until the 1870's that the crude death rate in New York City permanently fell below 30 per 1,000. The people of western Europe have been free from the specter of famine for only slightly more than a century. The last great famine was that of 1846-47 in Ireland. The total mortality from all causes during the five years ending in 1851 is estimated at nearly 1,000,000 persons, or one-eighth of the population of Ireland just before the famine.

The increasing control over the forces of high mortality has removed part of the controls on the high reproductive potential of man with a consequent absolute increase in population size unparalleled during his long history. (Figure 1) There is ample evidence to demonstrate that the recent spurt in population growth is due to a decrease in mortality and has occurred in spite of a general decline in fertility.

The size of the world's population 25,000 years ago, the approximate end of the last glaciation, is unknown but probably did not exceed more than a few million in number. The subsequent increase in size undoubtedly was very slow and was interrupted by periods of actual decrease. Following the discovery of agriculture and the domestication of food-supplying animals about 8,000 B.C. to 5,000 B.C., man gradually became less dependent upon wild sources of food. A more stable and abundant food supply undoubtedly speeded up the absolute increase in the total population.

All of this is largely conjecture and the dotted line from 23,000 B.C. to 1650 A.D. in Figure 1 should be regarded as nothing

FIGURE 1. Estimated population of the world 1650-1956 and schematic representation of the net increase in population from 23,000 B.C. to 1650 A.D.

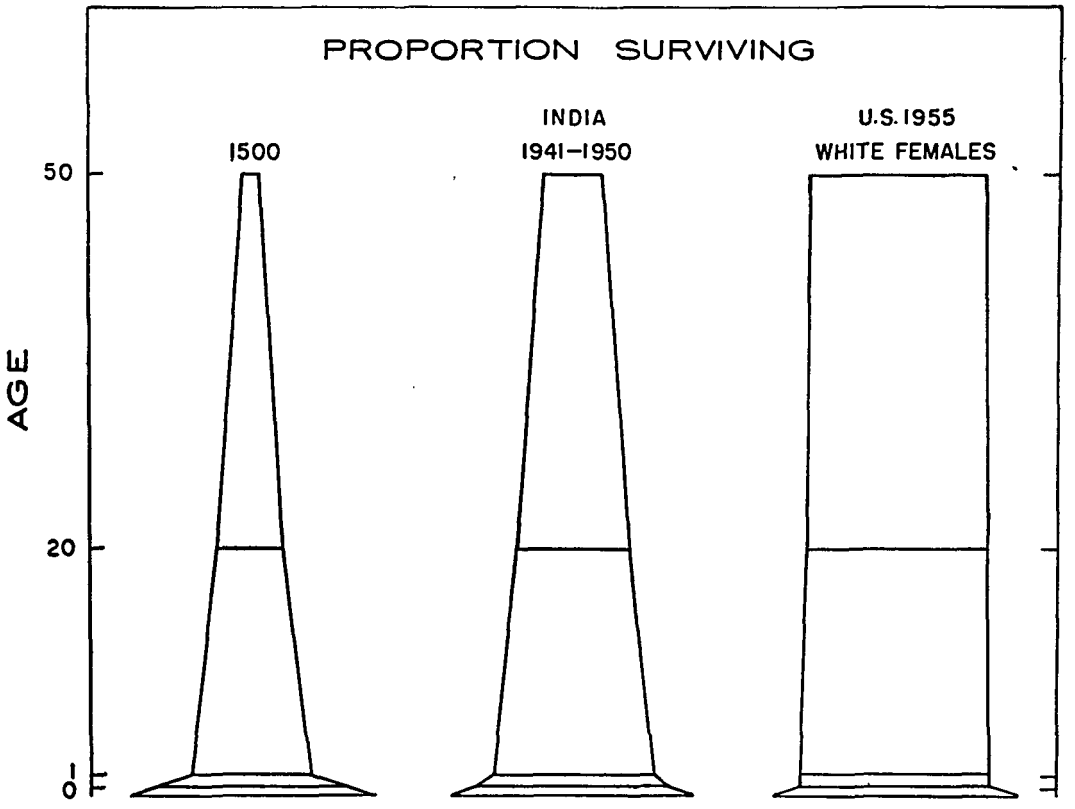


more than a rough representation of the change in population during this period. The actual change almost certainly was not linear; the trend line is designed to suggest that the growth of population during this period was very slow.

The first reasonably accurate estimate of the world's population is a figure, due to Carr-Saunders, of about 500 million around 1650. Three centuries later, 1955, the United Nations Demographic Yearbook gave the world's population as 2.7 billion. During the past century alone, the net increase in the population of the world has exceeded the total number of persons accumulated during the preceding millenia of human existence.

So rapidly has this change taken place that toward the end of the nineteenth century, representatives of the entire range of cultures since the middle Pleistocene, 300,000 to 400,000 years ago, could still be found. When Great Britain took possession of Tasmania in 1803, it was inhabited by a dark, wooly-haired people who lived by hunting and food-gathering and who had no domesticated animals, not even dogs. Their only weapons were clubs, stones, and pointed sticks similar to early Stone Age spears. Their chipped stone tools were as crude as those of the Neanderthal man. The Tasmanians would have been regarded as savages by people of the latter part of the Stone Age who already

FIGURE 2. Estimated proportion of female conceptions surviving to the end of the reproductive ages.



had specialized bone and flint tools and cave paintings. The last Tasmanian died in 1876.

The recent spectacular spurt in the growth of the world's population has been the direct result of a rapid decline in mortality rates which has lead to a sharp increase in the average length of life. Although accurate statistics do not exist, the expectation of life at birth in Greece, Rome, and Egypt during a period of approximately 500 years around the birth of Christ probably did not exceed 30 years. By 1900, it had increased to about 45-50 years in North America and most western European countries. A figure of 68-70 years has now been attained by the population of many of these countries. Thus the increase in expectation of life at birth during the past half century has been as great as or greater than that during the previous two thousand years.

An important effect of the decline in mortality rates often is overlooked, namely the increase in effective fertility. Figure 2 portrays the change that has taken place in the proportion of female conceptions that survive to the beginning and to the end of the childbearing period. Although the left diagram is labeled 1500 A.D., it could just as appropriately represent any date near that period.

The percentage of conceptions that are live-born is assumed to be the same for all three diagrams—80 per cent. Around 1500, only about one-quarter of conceptions sur-

vived to age 20; in the United States in 1955, the corresponding per cent was 78. From 5 to 8 of each 100 female conceptions during the earlier period lived to the end of the childbearing period, age 50 years, as compared to 74 of each 100 in the United States according to the mortality rates of 1955. The proportion of female conceptions living to the beginning of the childbearing period now is four times greater than in 1500; the proportion surviving to the end of the childbearing period is 10 to 15 times greater. A corresponding decline in the per capita fertility rate would be required to prevent this increase in survivorship from resulting in a rapid increase in population.

By 1950, only a small minority of the world's population had achieved an expectation of life at birth comparable to that of the population of the United States. Large numbers could anticipate mortality conditions no more favorable than those shown for India in Figure 2, a level reached by western Europeans during the eighteenth century.

During the past decade, the possibility of achieving a twentieth-century death rate within five to ten years has been opened to the masses of the world's population that still had an eighteenth-century death rate in 1940. The decline in mortality of the Moslem population of Algeria shown in Figure 3 illustrates what can be achieved by the application of existing knowledge.

In 1946-47, the death rate of the Moslem population of Algeria exceeded that of the population of Sweden in 1771-80, the earliest date for which accurate mortality statistics are available for an entire nation. During the next eight years the drop in the death rate in Algeria exceeded that in Sweden during the century from 1771 to 1871. The world-wide reduction in mortality is the most significant demographic event during the past decade and symbolizes both the extent to which man now can control his environment and the rapidity with which this control has been achieved.

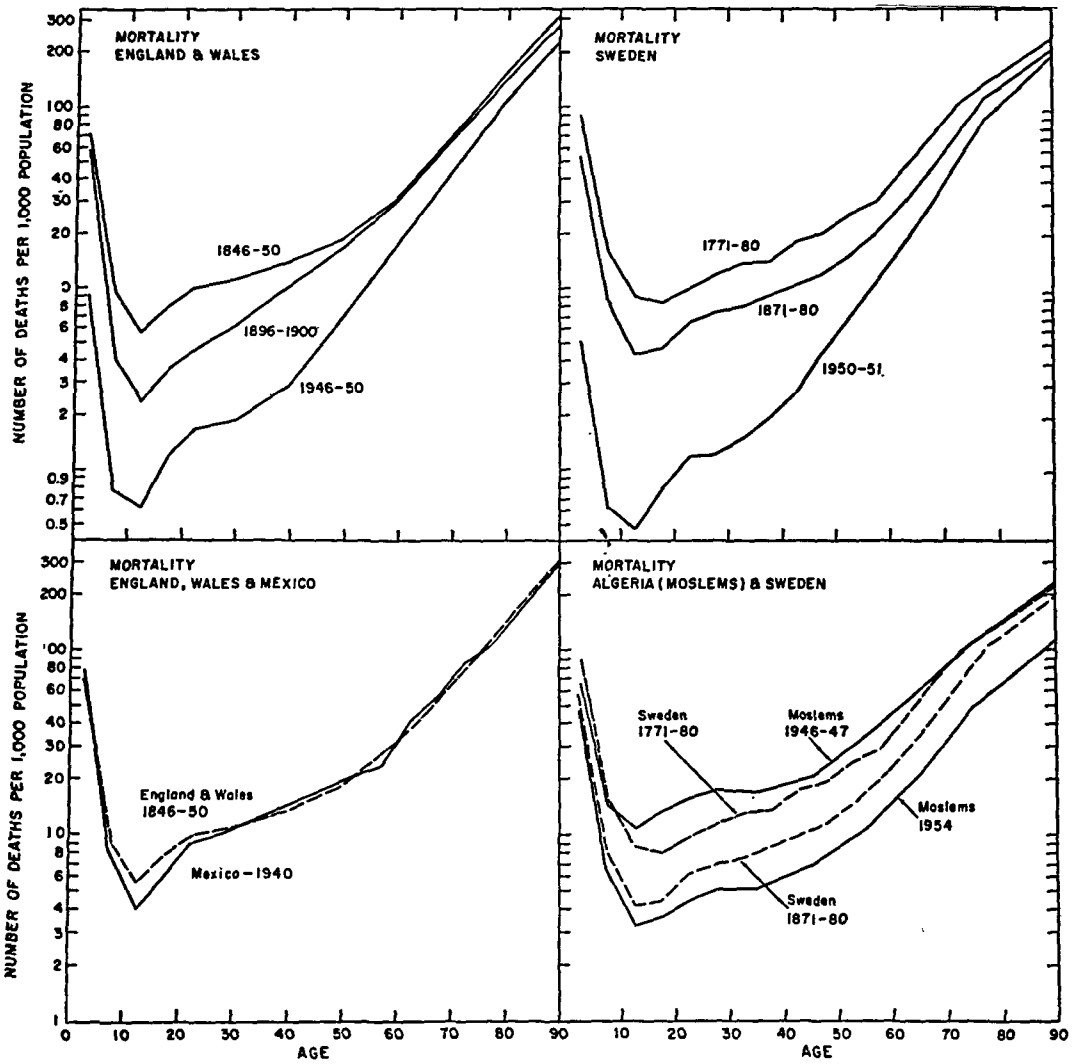
Man is as yet far from adjusted to his newly gained control over his environment. For the first time, a biological organism can consciously influence the direction of its evolution. We cannot foresee today how man will use this ability. We can, however, point out areas where patterns established in the past have been upset and where new adjustments must be worked out. I shall mention only three such areas: (a) the balance between births and deaths, (b) the process of natural selection, and (c) the location of centers of power and influence.

The Balance of Births and Deaths

Man has learned how to control two of the three historic governors of population increase—disease and famine. The third, war, in the past has not been an important direct regulator of population size in contrast to the importance of its analog among all other species of animals, namely the killing of one animal by another for food. As man has gained effective control over disease and famine, he has simultaneously magnified his ability to destroy all forms of animal life including himself by warfare. However, man can choose whether his knowledge of atomic fission shall be used for his benefit or for his destruction.

Nullification of the effect of the historic governors of reproductive potential has resulted in the current spurt in population increase at a rate that cannot long continue. If unchecked, the present rate of increase would generate a population of 60 billion persons in less than 200 years, an insignificant interval in comparison to the past history of man. It seems inevitable that man must consciously reestablish control over his reproductive potential and lower his birth rate to the level of his death rate within the next century and a half. If he does not, he will lose his power to control his future and the former regulators of population growth will once again reign supreme.

Figure 3. Age-specific death rates per 1,000 per year for Sweden, England, and Wales, Mexico, and the Moslem population of Algeria for various time periods, 1771-80 to 1954.



The Process of Natural Selection

Man is now in the fourth main stage of civilization, the scientific, having passed through three previous stages, hunting, agricultural, and industrial. During each stage, he has extended his ability to modify and control his environment until science finally has given him the power to direct the course of his evolution.

The three principal effects of this development that are relevant to this discussion are (a) the separation of sexual gratification from reproduction by means of contraception and telegenesis, (b) the virtual elimination of lethal selection as an important factor in natural selection, and (c) the establishment of culture as a guiding force in the future biological evolution of man.

As shown by Figure 2, three-fourths of all conceptions or more than 90 per cent of all live female births survive to the end

of the childbearing period in the United States, Canada, Australia, New Zealand, and most of the countries of central and northwest Europe. There is every reason to believe that the proportion of conceptions that survive to reproduce will continue to increase. It is now considered practicable to eradicate diseases such as smallpox, yaws, urban yellow fever, malaria, cholera, plague, and typhus whereas only a few years ago the most that could be hoped for was partial control. Rapid advances are taking place in surgery and in the transplantation of tissues, bones, and arteries. The successful transplantation of entire organs is an imminent possibility. The replacement of diseased vital parts of the body such as arteries and heart valves with synthetic inert substitutes is an accomplished fact.

The genetic effect of the virtual elimination of lethal selection is not clear. Selection exists only if by differential survival and fertility, individuals of one generation are disproportionately represented by progeny in the succeeding generation. What will be the effect of the survival of persons with genetically determined defects, for example juvenile diabetes, to the childbearing ages? Will differential fertility become less marked as the necessity of limiting family size in order to control rapid population growth becomes more apparent?

Society has gradually limited the right of an individual to destroy life by killing another human being until now such action is forbidden. Will the elimination of lethal selection and the restraining effect of mortality upon the high human reproductive potential similarly force society to limit the right of an individual to create life?

Location of Centers of Power and Influence

The place of the origin of *Homo sapiens* is unknown. Now extinct forms of man have been found in Asia, Africa, and Europe. Early in his career, two main groups of *Homo sapiens* became established, one in southeast Asia and the other in the region around the eastern Mediterranean . The history of the world, and in particular that of the western world, is largely a history of the development of the latter group. Until recent times the numerically larger population inhabiting southeastern and eastern Asia and adjacent islands has played a minor role in world history.

Throughout the history of the western world, a succession of relatively small population groups have become dominant due to superior knowledge and technology and have ruled their neighbors. At first, the region of dominance was comparatively small. The empires of Assyria, Babylonia, Persia, and Egypt are characteristic of this period. Each succeeding dominant group has extended its sphere of influence until by the end of the nineteenth century, the entire world was dominated by a small group of people of western European descent.

Alexander the Great extended the power of Greece throughout Asia Minor and to the very heart of India. His empire was more extensive than any before his time. His early death prevented the further extension and consolidation of his empire and it soon broke up. Alexander the Great was followed by the Romans who dominated the entire Mediterranean region, most of Asia Minor, western Europe, and England.

Until about the time of Galileo and Francis Bacon, new discoveries and inventions were largely hit or miss. Following the Renaissance, the systematic search for new knowledge gradually gained increasing support. It now is an essential and integral part of our modern civilization. The search for new knowledge and the subsequent technological development flourished most extensively among the populations of the countries of western Europe and led to their virtual domination of the entire world by the end of the nineteenth century.

Around 1500 the population of Europe probably did not exceed 100,000,000 or perhaps 15 to 20 per cent of the world's population and occupied about 7 per cent of the land area of the earth. Four hundred years later, in 1900, the descendants of these people numbered 550 million or one-third of the population of the world. They occupied or controlled five-sixths of the land area of the earth. They had seized and populated two great continents, North and South America, and one smaller continent, Australia, together with its neighboring island, New Zealand; they controlled a fourth continent, Africa, and dominated Southern Asia and adjacent islands.

The English-, French-, and Spanish-speaking peoples were the leaders in this empire building with lesser roles being played by the Portuguese and Dutch. The Belgians and Germans participated only toward the end of this period of expansion. Of these, the English-speaking peoples profited most.

The population of England around 1500, the start of this period of expansion, is unknown but probably did not exceed four or five million. By 1900, the English-speaking population numbered 129 million and occupied or controlled one-third of the land area of the earth and with the non-English-speaking inhabitants of this territory made up 30 per cent of the world's population. Never before in the history of the world had so few people been able to dominate such a large proportion of the total population and to control so much of the world's resources.

Since World War II the scientific knowledge and technological skill of the Europeans and their descendants have become available to the remainder of the world. In the past, most scientific discoveries have been made by a very small proportion of the world's population. Now the people of the U.S.S.R. and Japan must be included in this group and, in the not far distant future, the teeming millions of China and India. The tempo of discovery and change almost certainly will rapidly increase. It seems inevitable that the breaking up of the world domination by western Europeans and their descendants, which already is well advanced, will continue and that the focus of power and influence will shift toward the demographic center of the world.

The future will be marked by a dramatic increase in man's ability to control his environment provided he rapidly develops cultural substitutes for those harsh but effective governors of his high reproductive potential, pestilence and privation, that he has so recently removed. Whether man can use his scientific knowledge to guide his future evolution more wisely than the blind forces of nature, only the future can reveal. The answer will not be long postponed.