statistical information available about them, but precision will be given to the material on which social scientists are already working.

It is perhaps not possible to look to the results of the 1951 census with that same degree of uncertainty which must have whetted the appetite of the curious in 1801 and 1811, but to all who are interested in the material problems of our society the coming census will clearly have much to offer; and, if a conclusion may be made on a note of paradox, it is interesting to observe that, whereas the Britain of 1801 with its population of 11 millions sought statistical information on what it deemed to be its problems of over-population and an excessive birth rate, to-day, with a population more than four times as numerous, it is a low birth rate and a consequent reduction in population growth that causes most general concern.

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MEDICAL SIGNIFICANCE OF THE CENSUS

BY

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Although Moses, Joshua, Saul, Solomon, and Jehoram each succeeded uneventfully in numbering some or all of the people of Israel, King David was less fortunate, and his Satan-inspired venture in 1017 B.C. provoked Divine wrath and drew on Israel a three-day pestilence, "and there died of the people from Dan even to Beer-sheba seventy thousand men."¹

Credit is claimed by Canada for the first census of modern times, a census of the Colony of New France in 1666.² The first complete census of a European country was held in Iceland in 1703,³ followed by Sweden in 1749.⁴ After a considerable amount of religious opposition had finally been overcome the first census in England was held in 1801. Since then there has been a census in this country every 10 years, with the exception of 1941. Despite the forebodings of our eighteenth-century legislators, no pestilences have resulted that can be attributed to these enumerations. On the contrary, by its contributions towards knowledge of the numbers of people and of the conditions under which they live, the census has played an important part in the prevention of disease.

Death and Sickness Rates

The first contribution that the census makes to workers in the medical field is to provide denominators for the various arithmetic indices—the sanitary indices—that

measure the state of the public health. Often it is not enough to know the number of cases of illness or of deaths occurring in a community unless the number at risk is also known—usually the number of persons living in the community at the given time. This is not all, however; of almost equal importance to knowing the total numbers at risk is to know their sex and age distribution. Sickness and death rates of males differ from those of females, and rates for the young differ from those for the old. To compare the death rates, say in two towns, it is necessary to use some method of standardization to make allowance for sex and age differences in the two populations, and for this to be done it is necessary to know what these sex and age differences are.

Similarly, comparison of death rates between one year and another must involve some form of standardization if fallacious conclusions about the trends of health and sickness are to be avoided. It is well known that the population of this country has been ageing for some time past—that is to say, the proportion of young persons has been becoming less and the proportion of old persons more. This change has been the result partly of a more or less progressive fall in birth rates during the course of this century and partly because people live, on the average, several years longer now than ever before. Since old people, whatever their state of health, are normally more liable to die than young people, it follows that the more old people there are in the population the higher will be the crude—that is, unstandardized—death rate. As a result the crude death rate for England and Wales, which averaged 23.3 per 1,000 per annum in 1846-50 and had fallen to 12.1 by 1921-5, was still 11.8 in 1949. This does not indicate a slowing down of improvement in the nation's health, but just the opposite. When allowance is made for ageing of the population, the death rate in 1949 is found to have fallen by almost 30% compared with 1921-5.

The accompanying Chart shows the proportions of the population at

different ages as revealed by the censuses of 1841, 1901, and 1931, and the estimated proportions in 1950. This year's census will show whether or not the estimates of proportions for 1950 have been good ones.

Since sickness rates as well as death rates tend to increase with advancing age,^{5, 6} it must also be expected that in an ageing population the crude sickness rate may be slow to fall or may even tend to increase despite a real improvement in health.

Proportionate distribution of the population of England and Wales at ages 0-14, 15-44, 45-64, and 65 and over in 1841, 1901, 1931, and 1950. (The percentage of persons at each age is indicated within the Chart.)

Life Tables and Expectation of Life

A further purpose that is served by accurate census information on the sex and age composition of the population is the construction of national life tables, and hence the calculation of the expectation of life. Although there are no longer the vigorous discussions on life-table principles and techniques that were a feature at gatherings of vital statisticians early this century, life tables still have important uses and will continue to be constructed. Early attempts to build up life tables, such as Halley's, could not be fully successful, since details of the population by sex and age were not known, and it has only been since the introduction of the census that life tables have been constructed accurately.

The expectation of life—that is, the average number of years that will be lived by a group of persons of given age subject to given mortality experience—is derived from the life table. The expectation of life in England and Wales has progressively increased according to the successive English Life Tables calculated after each census. Thus expectation of life at birth increased for males from 40 years in 1841 to 59 years in 1931, and for females from 42 to 63 years. *Approximate* expectations of life in 1949 were 66 years for males and 70.6 years for females.

Occupational Mortality

Among the most useful medical statistical studies that have been made in this country are the series of analyses of mortality in relation to occupation and social class, described by Greenwood as "the most valuable single instrument of socio-medical research our national armoury contains."⁷ The twin bases of these occupational mortality analyses are: (1) the occupations of deceased persons as stated at the registration of death; and (2) the occupations of the living as stated on the census schedules. These analyses can be made only in and near the years when census information on the occupations of the living is available to provide denominators for the numbers of deaths. The pioneer work in this field has been done in this country, where occupational mortality analyses have been made in relation to each census from 1851. In the two most recent analyses, dealing with deaths in the periods 1921–3⁸ and 1930–2,⁹ the various occupations were grouped into a number of Social Classes—viz., I, Professional and Managerial; II, Intermediate between I and III; III, Skilled workers; IV, Intermediate between III and V; and V, Unskilled workers. Relative mortality of men in these Social Classes in 1921–3 and 1930–2 is shown in Table I, allowance being made for differences in the age structure of the groups.

TABLE I

	Social Classes					All Males Aged 20–65
	I	II	III	IV	V	
1921–3 ..	82	93	94	99	124	100
1930–2 ..	90	94	97	102	111	100

It will be interesting to see whether the analysis for 1950–2 will show further narrowing of the gap between Social Classes I and V.

In 1930–2 the occupation with the highest mortality of males was that of tin- and copper-mine workers below

ground, with a mortality experience 242% above the average for all males. Medical practitioners had mortality rates 6% and coal-miners (all men engaged in coal-mining) 7% above the general average.

Deaths of males from angina pectoris and coronary disease showed a strong social class gradient in 1930–2 (Table II).

TABLE II

Social Classes					All Males Aged 35–65
I	II	III	IV	V	
237	148	95	66	67	100

Since 1930–2 the recorded mortality from coronary disease has increased tremendously, and when the deaths during 1950–2 can be tabulated it will be of considerable interest to learn whether the excess of mortality in the professional occupations still persists.

Deaths of married women during 1930–2 were analysed by occupation of husband. Since husbands and wives in general share the same socio-economic environment but differ in respect of occupation, it was thus possible to distinguish the adverse effects of socio-economic from occupational factors. It is intended to repeat this type of analysis with deaths during 1950–2.

Attention will also be paid once again to variations in infant mortality in relation to the father's occupation and social class. Previous analyses of this have revealed considerable disparity between the social classes. Table III shows the relative rates of mortality of legitimate infants dying under 1 year of age in 1921–3 and 1930–2.

TABLE III

	Social Class					All Classes
	I	II	III	IV	V	
1921–3 ..	48	70	97	113	123	100
1930–2 ..	53	73	94	108	125	100

Enumeration of Infirmities

At each of the English censuses during 1851–1911 questions were asked for the purpose of ascertaining the number of persons blind or deaf and dumb. In the absence previously of authentic information about their numbers, great disadvantages were said to have resulted "to those afflicted persons on whose behalf the appeals and efforts of philanthropy, unsupported by a reference to facts illustrative of their numbers and condition, have lost much of their intended effect."¹⁰

In 1851 one person in every 979 was returned as blind, and, according to Farr,¹¹ one of the most prolific causes of blindness in England was smallpox, which was responsible for more than one-sixth of the cases. At each census from 1871 to 1911 information was also obtained about the number of persons lunatic, imbecile, or feeble-minded. Questions about infirmities were not asked at the censuses of 1921 and 1931, since it had come to be recognized that the information elicited was unreliable.

Enumeration of the Sick

No attempt has been made at the English censuses to obtain direct information about prevalence of disease, but a notable incursion into this difficult and unexplored field was made at the census of Ireland in 1851. In the words of the Census Commissioners: "In making

arrangements for taking the census the subject of the diseases of the living occupied our attention, and preparations were accordingly made for procuring returns of all those persons who laboured under disease either at their homes or in public institutions upon the night of March 30, 1851."^{12a} The purpose of the inquiry was thus described on the Sick Returns (schedules) that were used: "The alleviation of human suffering arising from bodily infirmity is a work in which every member of the community should naturally feel an interest; and one important step in this direction is to ascertain the extent and character of the evils to be contended with; towards these most desirable objects the Commissioners hope to assist by means of this Return."^{12b}

The results of this pioneer inquiry, published in a volume entitled *Report on the Status of Disease*, might not, by modern standards, be regarded as giving very sound evidence upon the prevalence of disease; nevertheless the inquiry was not without value, and was repeated at each census of Ireland until 1911. Out of a total population of some 6½ million persons, 104,000, or 1 in 62½, were returned as "labouring under disease" on the chosen night; 9,000 of these in hospitals, asylums, and gaols, 47,000 in workhouses, and 48,000 in their own homes. One-third of the sick were returned as suffering from an infectious disease, one-quarter from disease of the nervous system, and one-tenth from respiratory disease including consumption. Circulatory disease was infrequent, afflicting only 0.5% of those sick. Coronary disease, of course, was not mentioned, but the following passage in connexion with the 266 cases of heart disease (out of over 6 million persons) reported by people in their own homes contains matter for pondering upon: "As, however, a diagnosis of cardiac affection could not well be made except by professional persons, and as the peasantry of Ireland popularly term several other affections chiefly of dyspeptic character 'diseases of the heart,' from the distress experienced being, for the most part, referred to the precordial region, we think it likely that the number returned as labouring under disease of the heart at their own homes is somewhat exaggerated."^{12c}

Apart from blindness, deaf-mutism, and mental impairment, no attempt has been made at the censuses of England and Wales to ascertain the prevalence of disease, but, as has been emphasized earlier, the census enumeration of the population has been a necessity in order that the prevalence of disease, as determined by other methods, can be meaningfully related to the numbers at risk. The census, however, is more than an enumeration of the people by sex, age, and occupation. It is a periodic social survey embracing every individual in the country, determining not only the number but also the condition of the people in relation to their social environment, their homes, and their families. As such it not only provides the means for recording the results of medical progress in the past but also points out some of the directions in which further efforts are needed to achieve still greater progress in the future.

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SLEEP PROBLEMS IN THE FIRST THREE YEARS

BY

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The extreme frequency of sleep problems in young children might suggest that the abundance of material would have led to an extensive literature on the subject. A search, however, of the last 50 volumes of the *Index Medicus*, covering the world's literature of the past 25 years, revealed a mere 18 papers. Four of these were British and one was American. In contrast, the last 20 volumes of the *Index* listed 53 papers on lipochondrodystrophy (gargoylism). Only two of the ten papers which I was able to obtain gave practical hints of value in treatment—those by Wallgren (1937) and Spock (1949). Bakwin (1948) discussed the psychological aspect of sleep disorders.

Perusal of numerous volumes on child psychology showed that they too failed to discuss the practical management of a child with sleep refusal, Cameron (1946) and Kanner (1948) alone discussing the problem in detail. Cameron regarded the problem as one of the nervous highly strung child. Gesell and Ilg (1934), however, in an excellent discussion of the normal development of sleeping behaviour, emphasize that these sleep difficulties are not due to "nervousness" but that they arise in perfectly normal children, without any mismanagement, as part of the normal course of the evolution of their character and behaviour.

I have attempted to present the problem and to discuss those questions to which I do not know the answer, in the hope that others with more experience will be stimulated to put it into words and express their views.

Normal Sleep Patterns

This section is based on the work of Arnold Gesell, supplemented by my own experience.

Sleep problems are extremely common at one time or another in young children. The extent of the problem depends chiefly on two factors—the innate character of the child and his management by his parents. Few today believe that the character and the behaviour of a child are entirely engendered by his environment. The environment may modify but never completely change the character traits with which he is born. It is a mistake to suppose that sleep problems arise only as a result of mismanagement, spoiling, or unhappiness. Some particularly placid children present practically no problem. As infants they sleep a large part of the day in the "pram" with nothing to do, little to see, and without company. They are willing to be left in the pram long after the more active child has refused to have anything to do with it. A rigid bedtime schedule suits them well, while their more active determined brothers may not